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Original Research Article

Continuum of maternal health care services among peri-urban women- a community-based cross-sectional study in North India

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ABSTRACT

Background: Low level of utilization of continuum of maternal health services (CMHS) is a major factor responsible for high maternal mortality and morbidity. This study was conducted to assess status of utilization, determinants and satisfaction of /about CMHS in peri-urban women of north India.
Methods: A community based, cross-sectional study of 310 recently delivered women (RDWs) was conducted. Data were collected using a structured interviewer administered questionnaire and analysed using SPSS 26.0.
Results: 158 (51%), 228 (73.5%) and 92 (29.7%) of RDWs had full utilization of antenatal care (ANC), intra natal care (INC) and post-natal care (PNC) respectively. Birth order, education of husband, complications in previous pregnancies, type of family, first ANC visit and place of ANC were significant ($p<0.05$) predictor of full utilization of ANC. Education of RDW and husband, complications in previous pregnancies were significant ($p<0.05$) predictor of full utilization of INC. Age, birth order and education of husband were significant predictors ($p<0.05$) of full utilization of PNC. Full utilization of overall CMHS was only 60 (19.4%). >70% RDWs expressed satisfaction with the quality of CMHS while 28.5% were not satisfied.
Conclusions: Utilization of all the three aspects of CMHS still lagging behind with regards to required goals with full utilization of PNC, as limiting factor. Comprehensive approach to increase utilization of CMHS is need of hour, to address the issue of drop out with special emphasis on PNC.

Keywords: Antenatal care, Intra-natal care, Maternal health services, Peri-urban area, Post-natal care

INTRODUCTION

Maternal mortality refers to deaths due to complications from pregnancy or childbirth. From 2000 to 2017, the global maternal mortality ratio declined by 38% (from 342 to 211 deaths per lakh).[1] A substantial proportion of MMR is compounded by developing countries with India being a major contributor. Moreover, 75% of India's maternal deaths were associated with problems during and after pregnancy.[2,3] Most maternal deaths are preventable if mothers receive essential healthcare before, during, and after childbirth.[4,5] The continuum of maternal healthcare services (CMHS) has been emphasized to improve maternal as well as child health through integrated service delivery. It encompasses antenatal care (ANC), intra natal care (INC) and postnatal care (PNC). Moreover, a well-functioning CMHS can increase women's satisfaction and maximize efficiency in resource-limited settings and vulnerable peri-urban areas.[6-8]

Government of India in tune of global health agencies has implemented several programs to reduce maternal mortality and improve maternal as well as child health.[5,9-

[11] Though peri-urban areas (rural-urban transition zone) areas have better health facilities as compared to rural areas, still residents of these areas are unable to utilize essential maternal health services.[10,11] though overall CMHS in India has been improved, however level of uptake is still considerably low among the women residing in peri-urban areas.[2,5,9-11] Several studies have reported that various socio-cultural factors affects health seeking behaviour. these factors are likely to be critical determinants of seeking care and service utilization in the context of pregnancy.[2,9-15]

Hence, this study was conducted with following objectives- 1) to assess the status of utilization of continuum of maternal healthcare services, 2) to find out determinants of continuum of maternal healthcare services and 3) satisfaction among recently delivered women (RDWs) regarding continuum of maternal healthcare services.

METHODS

Study setting and population

A community based, cross sectional study was conducted in the four peri-urban areas of north India, among RDWs from January 2016 to December 2016.

Sample size

Sample size was calculated by using, 52.5% prevalence (one ANC check-up) by using formula- $4pq/l^2$ with allowable error of 6% with 95% confidence interval and 10% dropout/non-response.[16] After applying current birth rate on study population, number of eligible women came out to be ≈310 so it was decided to include each and every recently delivered women in present study. Total 312 RDWs were found eligible. Two RDWs were found to be non-responsive, as one RDW has not given consent and other was absent on two consecutive visits. Finally, 310 RDWs, who had given consent were included in the study.

Study tool

Pretested, semi-structured, semi-open questionnaire, comprised- information of socio-demographic profile, Utilization pattern and satisfaction regarding utilization of CMHS was used in the study. Level of satisfaction was assessed with a four items Likert scale which were added up to get sum index ranging from 1 to 12. The responses were graded as- 1) not satisfied 2) somewhat satisfied 3) satisfied 4) very satisfied. The index was then dichotomized into two- not satisfied (those with low score 1-6) and satisfied (those with high score >6).

Data collection

Pilot study (inclusive) was done among 30 RDWs, to validate the questionnaire and necessary modifications were done to collect relevant data. Then household survey was done and RDWs were interviewed after taking informed written consent. Repeated visits were scheduled for those women, who had delivered within previous six weeks to complete history of PNC.

Inclusion and exclusion criteria

All recently delivered women of reproductive age group, who had given birth in last one year preceding the time of interview and consented for interview were included. Houses found locked or eligible woman not present in 2 consecutive visits and not given consent counted as non-response and excluded from the study.

Data analysis

Data collected was checked for consistency and completeness before entry and analyzed by SPSS- 26.0. Proportion, frequencies were used to display continuous data. 95% confidence intervals (CI) and p-value (<0.05) was considered significant. Chi-square (χ^2) test and Binomial logistic regression were performed to ascertain the effects of various variables on the likelihood of full utilization of maternal health services, partial and no utilization were clubbed together. All model were significant, $\chi^2(14) = 111.84$ (ANC), 81.205 (INC) and 71.365 (PNC), $p<0.005$ according to Hosmer and Lemeshow test. Models explained 40.4%, 33.6% and 29.2% (Nagelkerke R square) variance and classified 74.5%, 77.7% and 75.2% case accurately in full utilization of ANC, INC and PNC respectively. Linearity of continuous variables was assessed by Box- Tidwell procedure. 9, 7 and 10 cases were outlier (as per case wise diagnostic), but they were included in analysis of ANC, INC and PNC respectively.

Ethics consideration

Ethical approval was obtained from the Institutional Ethics Committee. The women were explained about nature and purpose of study and written consent was taken from them. Confidentiality of the given information was maintained. Health education, counselling and appropriate referral has been provided.

RESULTS

Socio-demographic profile

Study population was in 20-34 years age group with 282 (91%) RDWs, Islamic 272 (87.7%), illiterate 128 (41.3%), homemakers 286 (92.3%), lower middle class 105 (33.9%) and joint family 178 (57.4%) predominantly. The mean age was 25.4±4.1 years. Husbands of 87 (28.1%) and 142 (45.8%) RDWs were illiterate and unskilled workers respectively. 167; 53.9% of RDWs married at an age ≤18 years. The mean age at marriage was 18.96±3.4 years.

Antenatal care (ANC) service

Full utilization of ANC i.e. early registration of pregnancy, at least four ANC check-ups, including a weight and blood pressure check-up, abdominal and urine examination, immunization against required doses of tetanus toxoids and 100 or more iron and folic acid prophylaxis as well as anaemia management, partial utilization was defined as lacking any one criteria of full ANC.[17] In present study 158 (51%) of women had full utilization of ANC services. 133 (42.9%) women partially utilized and 19 (6.1%) not utilized any ANC services (Figure 1).

Table 1: Determinants of full utilization of ANC services (n=310).

Variables		N	B	P value	Crude OR$ (95%CI)	aOR# (95%CI)
Age (years)		----	0.024	0.696	1.01 (0.954-1.06)	1.03 (0.907-1.157)
Age at marriage (years)		----	0.128	0.057	1.21 (1.116-1.30)	1.14 (0.996-1.298)
Birth order		----	-0.343	0.047*	0.69 (0.58-0.81)	0.71 (0.506-0.995)
Education of RDW	Up to middle school	198	-----	-----	----	Reference
	High School and above	112	0.237	0.524	3.85 (2.334-6.34)	1.27 (0.611-2.631)
Education of husband	Up to middle school	162	-----	-----	----	Reference
	High School and above	148	0.946	0.010*	4.73 (2.923-7.64)	2.58 (1.249-5.306)
Occupation of RDW	Homemaker	286	-----	-----	----	Reference
	Working	24	-0.327	0.554	0.67 (0.286-1.59)	0.72 (0.244-2.13)
Occupation of husband	Unemployed/unskilled worker	147	-----	-----	----	Reference
	Other	163	0.351	0.250	2.72 (1.716-4.30)	1.42 (0.78-2.588)
Complication in previous pregnancies	Yes	86	-----	-----	----	Reference
	No	224	-1.137	0.001*	0.67 (0.406-1.11)	0.32 (0.16-0.645)
Complication in present pregnancy	Yes	138	-----	-----	----	Reference
	No	172	0.535	0.064	1.72 (1.095-2.71)	1.71 (0.97-3.005)
Type of family	Nuclear	132	-----	-----	----	Reference
	Joint	178	0.942	0.001*	2.39 (1.509-3.79)	2.57 (1.447-4.549)
Religion	Hindu	38	-----	-----	----	Reference
	Islam	272	0.080	0.846	1.05 (0.53-2.06)	1.08 (0.485-2.417)
1st ANC visit	1st trimester	172	-----	-----	----	Reference
	2nd/3rd trimester	138	-1.004	0.000*	0.28 (0.177-0.45)	0.37 (0.210-0.64)
Place of ANC/ delivery	Government hospital	202	-----	-----	----	Reference
	Other	108	-0.678	0.036*	0.89 (0.558-1.42)	0.51 (0.269-0.958)
Decision maker	Self	50	-----	-----	----	Reference
	Husband/family member	260	0.296	0.468	2.07 (1.108-3.88)	1.34 (0.605-2.986)

Note- Partial /no utilization is taken as reference value. * 'p' value <0.05- significant; $OR- Unadjusted Odds ratio; #aOR- Adjusted odds ratio; CI- confidence interval

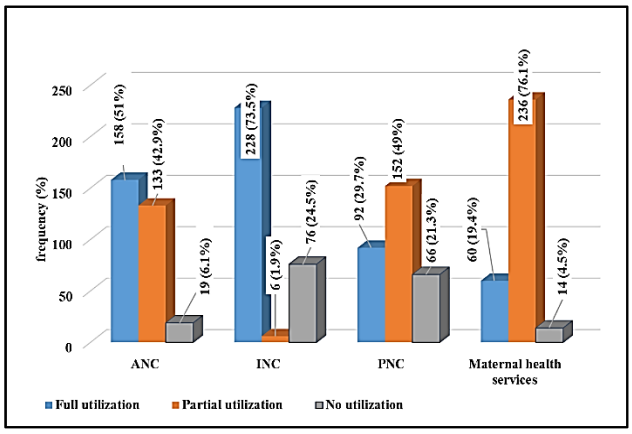

Figure 1: Status of utilization of continuum of maternal health services and its dimensions.

As depicted from Table 1; birth order or parity, education of husband, complications in previous pregnancies, type of family, first ANC visit and place of ANC were significant predictor of full utilization of ANC. Odds of full utilization of ANC was about 2.5 times higher among RDWs whose husbands were educated high school and above and living with joint families than those RDWs whose husbands educated up to middle school and living in nuclear family.

Intranatal care services

Full intranatal care was defined as when a woman has delivered in a health facility. Partial intranatal care (INC) means, delivery at home with skilled birth attendant (SBA) and no INC means delivery at home without any skilled assistance.[17] 228; 73.5% of women had full

utilization of INC/delivery care services whereas 6; 1.9% women did not utilized any INC service. Partial INC services (delivery at home with skilled birth attendant) were utilized by 76; 24.5% RDWs (Figure 1).

As depicted from Table 2; education of RDWS, Education of husband, complications in previous pregnancies were significant predictor of full utilization of INC. Odds of full utilization of INC among RDWs and their husbands educated high school and above was 3.735 and 2.45 times higher than those educated up to middle school.

Postnatal care services

A woman was considered to have full postnatal care (PNC) only when she has received at least four PNC visits and check-ups.[18] 92; 29.7% of RDWs had full utilization of PNC services whereas 66; 21.3% did not receive any PNC. Partial PNC services (lacking any one criteria of full PNC) were utilized by 152; 49% (Figure 1).

As evident from Table 3; age of RDWs, birth order and education of husband were significant predictors of full utilization of PNC services. Odds of full utilization of PNC among RDWs was 1.158 time higher with one unit increase of age (years) of RDW. Odds of full utilization of PNC among RDWs whose husbands were educated high school and above was 3.896 times higher than those educated up to middle school.

As evident from Figure 1, overall full utilization of CMHS was only 60 (19.4%). Full utilization of postnatal care services was limiting factor in full utilization of CMHS. While 236 (76.1%) women partially and 14 (4.5%) did not utilize maternal health service at all.

Satisfaction about CMHS

More than seventy percent women expressed satisfaction with the quality of CMHS while 28.5% were not satisfied (Figure 2).

Table 2: Determinants of full utilization of INC (delivery) services (n=310).

Variables		N	B	P value	Crude OR$ (CI 95%)	aOR# (CI 95%)
Age (years)		----	-0.061	0.259	0.96 (0.90- 1.019)	0.94 (0.846-1.046)
Age at marriage (years)		----	0.086	0.207	1.19 (1.078- 1.30)	1.09 (0.954-1.245)
Birth order		----	-0.228	0.069	0.67 (0.57- 0.798)	0.79 (0.622-1.018)
Education of RDW	Up to middle school	198	-----	-----	----	Reference
	High School and above	112	1.318	0.008*	7.76 (3.58- 16.83)	3.74 (1.405-9.929)
Education of husband	Up to middle school	162	-----	-----	----	Reference
	High school and above	148	0.897	0.035*	5.67 (3.09- 10.40)	2.45 (1.067-5.641)
Occupation of RDW	Homemaker	286	-----	-----	----	Reference
	Working	24	0.485	0.393	1.09 (0.416- 2.84)	1.62 (0.534-4.933)
Occupation of husband	Unemployed/unskilled worker	147	-----	-----	----	Reference
	Other	163	0.092	0.783	2.61 (1.54- 4.399)	1.09 (0.570-2.108)
Complication in previous pregnancies	Yes	86	-----	-----	----	Reference
	No	224	-1.018	0.007*	0.66 (0.365- 1.20)	0.36 (0.172-0.758)
Complication in present pregnancy	Yes	138	-----	-----	----	Reference
	No	172	-0.062	0.843	1.26 (0.76- 2.096)	0.94 (0.509-1.735)
Type of family	Nuclear	132	-----	-----	----	Reference
	Joint	178	0.179	0.574	1.61 (0.969- 2.68)	1.19 (0.640-2.234)
Religion	Hindu	38	-----	-----	----	Reference
	Islam	272	-0.885	0.123	0.38 (0.144- 1.02)	0.41 (0.134-1.27)
1st ANC visit	1st trimester	172	-----	-----	----	Reference
	2nd/3rd trimester	138	-0.213	0.500	0.43 (0.258- 0.72)	0.81 (0.435-1.501)
Place of INC/ delivery	Government hospital	202	-----	-----	----	Reference
	Other	108	-0.317	0.355	1.12 (0.658- 1.92)	0.73 (0.371-1.427)
Decision maker	Self	50	-----	-----	----	Reference
	Husband/family member	260	0.648	0.102	2.36 (1.257- 4.44)	1.91 (0.88-4.151)

Note- Partial/no utilization is taken as reference value. * 'p' value <0.05- significant; $OR- unadjusted odds ratio; #aOR -adjusted odds ratio; CI- confidence interval

Table 3: Determinants of full utilization of PNC services (n=310).

Variables		N	B	P value*	Crude OR[$] (CI 95%)	aOR[#] (CI 95%)
Age (years)		----	0.146	0.031*	1.05 (0.99- 1.12)	1.16 (1.013- 1.323)
Age at marriage (years)		----	-0.087	0.205	1.14 (1.06- 1.22)	0.92 (0.801- 1.049)
Birth order		----	-0.52	0.013*	0.75 (0.62- 0.902)	0.59 (0.393-0.896)
Education of RDW	Up to middle school	198	-----	-----	----	Reference
	High school and above	112	0.387	0.287	4.50 (2.68- 7.549)	1.47 (0.722- 3.007)
Education of husband	Up to middle school	162	-----	-----	----	Reference
	High school and above	148	1.360	0.001*	6.19 (3.54- 10.84)	3.89 (1.787- 8.494)
Occupation of RDW	Homemaker	286	-----	-----	----	Reference
	Working	24	0.936	0.075	1.78 (0.759- 4.16)	2.55 (0.910- 7.142)
Occupation of husband	Unemployed/unskilled worker	147	-----	-----	----	Reference
	Other	163	0.281	0.393	2.95 (1.749- 4.97)	1.32 (0.695- 2.522)
Complication in previous pregnancies	Yes	86	-----	-----	----	Reference
	No	224	-0.34	0.356	1.04 (0.603- 1.79)	0.72 (0.352- 1.456)
Complication in present pregnancy	Yes	138	-----	-----	----	Reference
	No	172	0.038	0.897	1.56 (0.944- 2.56)	1.04 (0.580- 1.86)
Type of family	Nuclear	132	-----	-----	----	Reference
	Joint	178	-0.04	0.901	1.22 (0.745- 2.01)	0.96 (0.529- 1.751)
Religion	Hindu	38	-----	-----	----	Reference
	Islam	272	0.686	0.156	1.67 (0.737- 3.81)	1.99 (0.770- 5.125)
1st ANC visit	1st trimester	172	-----	-----	----	Reference
	2nd /3rd trimester	138	-0.32	0.293	0.46 (0.275- 0.77)	0.73 (0.403- 1.315)
Place of PNC	Government hospital	202	-----	-----	----	Reference
	Other	108	-0.14	0.666	1.30 (0.787- 2.16)	0.87 (0.468- 1.624)
Decision maker	Self	50	-----	-----	----	Reference
	Husband/family member	260	0.367	0.397	1.84 (0.879- 3.86)	1.44 (0.617- 3.378)

Note- Partial/no utilization is taken as reference value. *'p' value <0.05- significant; [$]OR- Unadjusted Odds ratio; [#]aOR -Adjusted odds ratio; CI- confidence interval

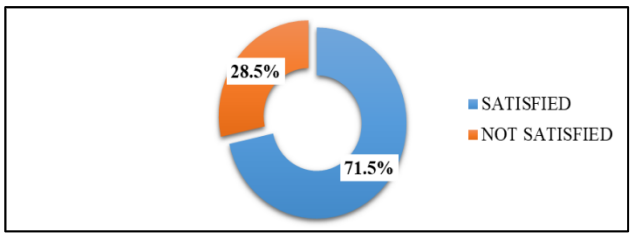

Figure 2: Satisfaction about maternal health services (n=310).

DISCUSSION

Present study reported 51% coverage of full ANC services as compare to 60.87% full utilization of ANC in Odisha; 1.6% and 4% in urban and rural area of Bihar respectively and 22.9%.[5,9,13] More than 93% mothers received minimum three ANC visits and 6.7% received only partial ANC.[19] approximately 90% of pregnant women receive four or more antenatal visits in Ghana.[20] NFHS-5 district (Aligarh) fact sheet reported 44.7% mothers had at least 4 ANC visits.[21] About 60 % women received at least one ANC by skilled health professionals, of them >80% had four or more ANC visits.[22] 19.6% of the mothers did not receive any ANC in peri-urban area of Nabi Nagar, Aligarh.[23] These differences in utilization of ANC services could be due to different areas, sample size, socio-cultural differences and different study periods, accessibility and availability of CMHS and temporal gap between study periods.

This study reported 73.5% coverage of institutional deliveries better than Ethiopia (14.4%), (71%) and (20.5%) but lesser than Aligarh (82.6%), Ghana (80%) and East Godavari district (86%).[19-21,24-26] Better uptake of INC was probably due to increase in awareness regarding safe delivery practices due to regular contact with health workers and provision of monetary incentive under JSY and free of cost facilities through JSSK.

This study reported 29.7% uptake of full PNC, lesser than study reporting three or more PNC visits were received by 17 (10.8%) mothers.[27] Other studies reported that post-partum home visits/ care were received by 76% and 85% women.[19,28] Least utilization of PNC among CMHS in present study could be due to lack of awareness about its importance among the women and community at large. PNC is critical not only for woman's own health but it is also extremely useful to seek advice about care of new-

born (cord care, breast feeding, skin hygiene, immunization etc. and family planning advices.[29]

Majority (82.1%) of women said that because of availability of skilled attention, safety and better care of baby and mother they opted for institutional delivery. 69% RDWs were aware about PNC and stated that they should receive PNC services after delivery while 2.6% women said that it is necessary to avail PNC only when a problem arise. Level of awareness regarding maternity benefit scheme in present study found to be better than other studies (62.3%) and (<50%).[25,27]

Older age, age at marriage, better educational status of both RDWs and their husband, occupation of husbands, type of family and complications in previous or present pregnancies had positive impact towards utilisation of maternal health services. Illiteracy of women indicates issues of limited awareness and lower autonomy. These factors together reflect low decision-making power, affecting health seeking behaviour towards CMHS. Our results were consistent with other studies which reported that lower level of education is related to lower utilisation of maternal health services.[3,10,26,30]

Even though the provision of monetary incentive has been successful in reducing inequity in the utilization of INC and PNC, but it is all alone insufficient to motivate them to utilize full CMHS. PNC was crucial but relatively neglected component of CMHS, hence a missing link and limiting factor toward safe motherhood. Confidence and knowledge from previous pregnancies could be the major reasons for low utilization of PNC.

Study was conducted in peri-urban/slum areas which are vulnerable and less accessible area for health care services as a whole. Since PNC is least focused among all three dimensions continuum of maternal health care services; the study covered it as well.

Study results are generalizable to population with similar characteristics. Cross sectional nature of this study can't form causal inference. Despite this limitations, present study addresses an important aspect of the reproductive rights of women. Findings from this study will be useful for informing potential interventions that can assist women to access and improve utilization of maternal health services in similar settings.

CONCLUSION

Overall full utilization of CMHS was merely 19.4%. INC was the most utilized service followed by ANC and PNC. PNC services was the most passive component and limiting factor, due to which utilization of CMHS still lagging behind with respect to required goals.

Utilization of full ANC services with a high dropout rate is still a cause for concern. INC service was the most utilized aspect of CMHS, in the response of monetary incentive schemes and consistent contact with health personnel. PNC services emerged as least utilized services with a high dropout rate. The study reveals that there is gap in the actual need and felt need of continuum of maternal healthcare services. Many women do not utilize them either because of lack of awareness or they do not consider them to be necessary.

Recommendations

The findings of this study call for focused and sustained efforts geared towards promotion of use of CMHS, with special emphasis in peri-urban areas. In order to improve the health and well-being of both mother and child, comprehensive approach to increase utilization of CMHS is need of hour. Moreover, the health policies need to address the issue of drop out with particular reference to the PNC.

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Ethical approval: The study was approved by the Institutional Ethics Committee

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