

A cross-sectional study to assess the utilization pattern of maternal health services and associated factors in aspirational district of Haryana, India

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ABSTRACT

Background: In India mother related mortalities and morbidities are still significantly higher even after having various maternal program and schemes at regional and national level which reflects that such services are being under-utilized. **Aim:** The current study focused in assessing utilization pattern of maternal health services and associated factors in Nuh (Mewat). **Methods:** This present cross-sectional study was done for one year (2015-16) among mothers (15-49 years) under field practice area, PHC Taoru with minimum calculated sample as 645. The selection of participants was made using simple random sampling technique from available randomized list of villages. Data was collected by home-to-home visits using pretested, predesigned, standardized questionnaire and during analysis an association between variables was considered as significant if $P < 0.05$. **Results:** Out of 645 participants, 632 provided consent for inclusion into study. Any ANC and full ANC services was made by only 58.3% and 11.7% of participants respectively. More than half of the participants (52.7%) had suffered from pregnancy related complications. Variables such as lower age group, low decision-making capacity were significantly associated with not obtaining full ANC services ($P < 0.05$). **Conclusion:** In the present study major determinants of a women which influence utilization of maternal health care service includes their age, literacy status, parity, socioeconomic status and occupation. Such determinants shall be considered for upcoming intervention aiming to bring attitudinal changes and concurrently leading to improved and enhanced usage of maternal health care services.

Keywords: Antenatal care, education, maternal health care, parity, primary health center

Introduction

The most vital importance of maternal and child health (MCH) care services is to improve the outcome of both mother and child by preventing maternal and child mortality.^[1] It is well known fact that in the last twenty thirty years plenty of health programs are introduced at the national or state level for the MCH care. There is paramount improvement in the usage of health care services specifically for MCH in India after introduction of National

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Health Mission (NHM),^[2] but mother related mortalities and morbidities are still significantly higher even after having various maternal program and schemes at regional and national level which reflects that such service are being under-utilized whether its rural or urban area.^[3,4] Such programs and schemes are mostly desired by the underprivileged section of society.^[5,6]

The continuing incomprehension regarding determinants that predicts the preference of MCH by mother for self and for their children will prolong the wastage of hitherto scarce resource and humiliating statistics of mortality. It is important to dwell the determinants that predicts utilization pattern of MCH services whether in urban or rural locale to mediate accordingly to precise the disparity in demands and supplies of MCH services occurring in developing countries including India.^[7,8]

India is a country is known for its diversity in religions and cultures as there are regions that are quietly well performing for MCH services on the other hand there are regions with vexatious figures for MCH services. The international and Indian literatures have identified various sociodemographic correlates and MCH services delivering environments that are vital in usage of MCH services.^[9,10]

There are only few literatures throwing flash on MCH services utilization in Haryana, India, along with that the percentage of mothers acquiring the full antenatal care services are quietly very low in comparison to other Indian states. In this context, it is attention-grabbing to dwell the utilization patterns of MCH services and associated determinants. The current study was focused with an aim in assessing utilization pattern of maternal health services and associated factors in Nuh (Mewat). The findings of current study will enhance the attempts of local administration and policy makers to improve MCH care service-related programs.

Materials and Methods

Study area and study period

The present community based observational study with cross-sectional design was carried out at Taoru PHC, district Nuh (Mewat), Haryana, a field practice area under the aegis of Community Medicine, SHKM GMC for the purpose of teaching, training and research activities for medical undergraduate. The ethical clearance was obtained from the Institutional Ethical Committee prior to commence of study with reference letter number as SHKM/CM/2014/73 dated 29.08.2014. This present cross-sectional study was done for one year between September 2015 and August 2016.

Study population and sample size

The study subjects were mothers (15-49 years) who have delivered in the last one year and were staying in study area for twelve months or more. Mothers with serious illness such as malaria (fever in the evening hours associated with chills), severe

anemia (extreme paleness of either palm or tongue or lower inner side of eye lids), high-grade fever (temperature of 39.4°C or more), present history of urinary or vaginal discharge or burning micturition, and psychological distress) were excluded.

Estimation for desired sample size ($n = 516$) was based on consideration that the proportion of women received any ANC services in Haryana as 70.8%,^[11] by application of formula for cross-sectional studies [$n = (Z^{1-a/2})^2 \times p(1-p)/d^2$]. In that formula Z (1.96) is the standard normal variate for level of significance for 2-sided test with “a” as level of significance (0.05) at “p” of 70.8% as prevalence, with “d” as absolute allowable error (4%) and “n” reflects the estimated sample size. In the study an expected no responsiveness from approximately 20% participants was considered, so the final estimated sample size came out as 645 by applying formula: final sample size = calculated sample size/(1 - non response rate anticipated).

All 32 villages under PHC Taoru were enlisted. Out of these 32 villages, 20 villages were selected by adopting systematic random sampling procedure giving due representation to the study area. From each selected village a list of mothers (15-49 years) who have history of delivery (past 1 year) and were residing in that area for more than twelve months, was prepared using sub-center registers and approximately 32-33 mothers were included in study by using simple random sampling technique from the prepared list. Thus, a sample of 645 mothers was selected for the study. The population of adjacent village was appended if there was an unavailability of required number of subjects in that village.

Study tool

A standard questionnaire was used in the study which was pretested and predesigned, which included demographic details; utilization pattern of maternal health care services and pregnancy related complications. The questionnaire was first prepared in English. Then, it was translated into Hindi by an expert in that language keeping semantic equivalence. Again two faculty members with total unawareness to previous English version of questionnaire were requested to translate the Hindi version of questionnaire into English to ensure the translation.

The content of questionnaire for the collected fifty-two questions was put forward among a group of 10 faculty members for validity and to recognize the questions having highest level of agreement among faculty members. The quantification of concord among faculty members for each question was done using Aiken's V value (cut off as more than 0.07) so, out of 52 questions only 29 questions were included in the questionnaire. Each and every measure was taken to make the questions clear and obvious as per study's objective. A pilot study was done randomly among twenty mothers and it took on an average 20 minutes for completing the questionnaire.

The questionnaire had 3 sections and consisted of total 29 items. Section one consisted of ten items and gathered information

regarding participant's sociodemographic characteristics such as age, religion, literacy status, occupation, spouse literacy status, spouse occupation, age at marriage, parity, type of family, socioeconomic status and decision making in household/family matters.

The socioeconomic status was obtained using modified B.G. Prasad socioeconomic status classification (revised for year 2015, CPI 2001 as base). It is based on per capita monthly income and based on it has five categories such as Class I (Rs. 5798 and above), Class II (2899-5797), Class III (1739-2898), Class IV (870-1738) and Class V (869 and below).^[12]

There were seven items in the decision-making index (DMI) focusing on mother's part in decision of households and participation in the society. The responses for each item of DMI were 0 (others), 1 (together by husband and wife) and 2 (self). Depending upon the total DMI score, mother's capacity of decision making was classified as low, moderate and high.^[13]

Division two comprised of 17 items and aimed to gather the participant's utilization pattern for the maternal health care services including ANC registration, trimester for ANC registration, place of ANC registration, place for seeking ANC related services, number of self ANC visits, number ANC visits by health care workers, IFA tablets received, number of IFA tablets consumed, number of dose of TT vaccine received, place of delivery, delivery assisted by, any family planning method adopted, any PNC visit by self and any PNC visit by health care workers, any ANC and full ANC.

Any ANC was defined as those mothers who either consumed 100 or more Iron Folic Acid (IFA) tablets or received three and more antenatal visits or received one or more tetanus toxoid (TT) vaccine during pregnancy. The full ANC included mothers who had three or more ANC check-ups, and consumption of 100 or more Iron Folic Acid (IFA) tablets and received one or more TT vaccine during pregnancy.^[14]

Section three comprised of 2 items and aimed to capture the pregnancy related complications and sought treatment for such complications. The behavior to sought treatment was captured only for the latest complications (either life or non-life threatening, but life threatening event was only noted even if non-life threatening event was latest one) occurred during recent pregnancy.

Data collection

Principal investigator conducted house-to-house visits, contacted the mother. They were explained about purpose of this study and were requested to participate. The study included subjects who provided their written consent after understanding objectives of study. Questionnaire for subjects was administered by the investigator himself by face-to-face interview technique. Also, the filled questionnaires were then checked for the completeness. All possible attempts were made to keep the information pertaining to subjects as anonymous and confidential. Being elective and not requisite were the properties for participating in study.

Data analysis

Prior to analysis the entry of obtained response of subjects was done in MS Excel spreadsheet following which coding for variables was done accordingly and any erratum wherever found was removed. International Business Machines Corporation (IBM) Statistical Package for the Social Sciences (SPSS) Statistics for Windows, Version 26.0 (IBM Corp. Armonk, New York, United States of America) was utilized for carrying out the analysis of entered and cleaned data. Percentages (%) were used to represent the data of categorical variables. Chi square test was applied (5% level of significance) to find out the strength of association ($P < 0.05$) between dependent variable (full ANC care) and independent variables (age, religion, literacy status, occupation, spouse literacy status, spouse occupation, age at marriage, parity, type of family, socioeconomic status and decision making in household/family matters).

Results

Out of 645 participants, 632 subjects were included as a part of study as they provided their informed written consent. More than two fifth of mothers (44.8%) belonged to the age group of 21-30 years. Around two third of participants (61.2%) belonged to Muslim religion. Among study participants, 60.4% were illiterate and only 13.3% were working. About one third of participant's spouse (35.6%) were illiterate and two fifth (40.1%) of spouse were working. Not to surprise nearly one third of participants (38.3%) got married prior to attaining the age of 18 years. More than two fifth of participants (43.3%) were having three or more children and 42.3% were staying in joint families. Only one tenth of participants (13.4%) had high decision-making capacity for the family and social matters [Table 1].

The present study revealed that less than one tenth of participants (7.0%) never visited or availed ANC services. Among those who availed ANC services, only half of the participants (58.3%) made first ANC visit during 1st trimester; private health institution was the preferred place for ANC registration (53.6%) and seeking ANC care services (34.4%); only one fourth of participants (28.1%) made three or more ANC visits; whereas nearly two third of participants (59.4%) received at least one dose of TT vaccine. Among those who received IFA tablets, nearly one third of participants (30.1%) did not consumed it [Table 2 (i)].

Table 2 (ii) showed that any ANC and full ANC services was made by only 58.3% and 11.7% of participants respectively. Table 3, showed that more than half of the participants (52.7%) had suffered from pregnancy related complications, and excessive fatigue and severe headache were the most common symptoms; and only 54.6% of participants sought treatment for such complications. Table 4. showed that lower age group, lower literacy status, early age of marriage, lower socioeconomic status and low decision-making capacity of participants were significantly associated with not obtaining full ANC services ($P < 0.05$).

Table 1: Distribution of socio-demographic characteristic of study participants (N=632)

Study variable	Number (%)
Age (in years)	
<21 years	117 (18.5)
21-30 years	283 (44.8)
31-40 years	154 (24.4)
>40 years	78 (12.3)
Religion	
Muslim	387 (61.2)
Hindu	245 (38.8)
Literacy status	
Illiterate	382 (60.4)
Primary	109 (17.3)
Middle	93 (14.7)
Higher or above	48 (7.6)
Occupation	
Working	84 (13.3)
Housewife	548 (86.7)
Spouse literacy status	
Illiterate	225 (35.6)
Primary	173 (27.4)
Middle	139 (21.9)
Higher or above	95 (15.1)
Spouse occupation	
Working	253 (40.1)
Non-working	379 (59.9)
Age at marriage	
<18 years	242 (38.3)
18 years or more	390 (61.7)
Parity	
1	187 (29.5)
2	171 (27.1)
3 or more	274 (43.4)
Type of family	
Nuclear	365 (57.7)
Joint/Extended	267 (42.3)
Socioeconomic status	
Class I	63 (10.0)
Class II	77 (12.2)
Class III	253 (40.0)
Class IV	129 (20.4)
Class V	110 (17.4)
Decision making capacity	
High	85 (13.4)
Moderate	117 (18.6)
Low	430 (68.0)

Discussion

This study focused on the extent of utilization of maternal health care services. Here we made a bridge between several maternal health care facilities avail from the various health sector to understand the impact of individual healthcare facilities on the utilization of health care services. Further, it helps to find out the association between utilization pattern of MCH services by mothers and sociodemographic-economic variables. The findings suggest that the level of utilization of full antenatal care (11.7%)

Table 2 (i): Distribution of utilization pattern of maternal health care (MCH) services among the study participants (N=632)

Variables	Number (%)
Availed ANC services	
Yes	588 (93.0)
No	44 (7.0)
If ANC services availed	N=588 Number (%)
ANC registration done in which trimester (First ANC check-up)	
1 st trimester	343 (58.3)
2 nd trimester	125 (21.3)
3 rd trimester	120 (20.4)
Place of ANC registration	
Private	315 (53.6)
Public	273 (46.4)
Place of seeking ANC care services	
Only private institutions	202 (34.4)
Only public institutions	124 (21.1)
Both (private and public)	262 (44.5)
Number of ANC visits	
1	96 (16.3)
2	327 (55.6)
3 or more	165 (28.1)
ANC visits by health care workers	
Yes	265 (45.1)
No	323 (54.9)
IFA tablets received	
Yes	508 (86.4)
No	80 (13.6)
If received, number IFA tablets consumed (n=508)	
Not consumed	153 (30.1)
1-99	261 (51.4)
100 or more	94 (18.5)
Received at least one dose of 'TT' vaccine	
Yes	349 (59.4)
No	239 (40.6)

is quite low compared to any ANC (58.3%), which is supported by a study done by Ray *et al.*,^[11] where it was have shown that full ANC and any ANC services utilization by study subjects were 14.9 and 70.8% respectively.

In present study, the ANC utilization was significantly rising with the increase in the age of participants (5.1% among participants with age <21 years and 15.2% among participants in the age group 21-30 years) and it might be ascribed as with the increase in age of mothers, they gain lot of experience and become much edified regarding child bear and care services.^[15] Along with that traditionally in India, with the increase in age women potentials for decision making for the betterment of self and family are also enhanced which further renders improved ANC utilization by mothers.^[16-18]

The utilization of ANC was higher among participants (15.5%) and spouse (14.1%) who were working when compared to non-working participants (11.1%) and spouse (10.0%). Indian societies are well known for male predominance when it comes to decisions making due to their major role as bread earner in the family and majority

Table 2 (ii): Distribution of utilization pattern of maternal health care (MCH) services among the study participants (N=632)

Variables	Number (%)
Place of delivery	
Public Institution (Medical college/GH/CHC/PHC/SC)	225 (35.6)
Private Institution (Hospitals/Nursing homes)	97 (15.3)
Home	310 (49.1)
Delivery assisted by	
Doctor	123 (19.4)
Nurse/LHV/ANM/TBA	173 (27.4)
Untrained birth attendant	336 (53.2)
Any family planning method adopted	
Yes	98 (15.5)
No/Lactational amenorrhoea	534 (84.5)
Any Post-natal care (PNC) visits herself	
Yes	287 (45.4)
No	345 (54.6)
Any Post-natal care (PNC) visits by health care workers	
Yes	166 (26.3)
No	466 (73.7)
Any ANC	369 (58.3)
Full ANC	74 (11.7)

Table 3: Distribution of pregnancy related complications among study participants (N=632)

Variables	Number (%)
Pregnancy related complications	
Yes	333 (52.7)
No	299 (47.3)
If yes specify symptoms*	
Edema	141 (22.3)
High grade fever	109 (17.2)
Convulsion	44 (6.9)
Severe headache	157 (24.8)
Lower abdomen pain	131 (20.7)
Foul smelling excessive blood	28 (4.4)
Excessive fatigue	248 (39.2)
Sought treatment for the symptoms (n=333)	
Yes	182 (54.6)
No	151 (45.4)

*Multiple responses

of female being housewives reflects their financial dependency, so males being decision makers complemented with higher literacy and economic status easily affects and support the behavior of females to utilize the MCH services.^[19,20]

In present study it was observed that the usage of antenatal services was higher with the enhancement in the literacy status of mothers and highest ANC usage was found among mothers with literacy status as higher school or above and lowest was found among illiterate mothers. This pattern is similar to the findings of Singh *et al.*,^[21] Kaur *et al.*,^[22] and Barman *et al.*,^[23] which can be factually described that with the enhancement in the educational level, mothers are more aware

of ongoing health related schemes and programs which in turn improves their MCH care services usage. So, there is dire need that females from childhood shall be provided with basic education to improve the usage of ANC services in the future.

It was found in the present study that with the increase in number of children, there is increase in the ANC services utilization. The reason behind this could be that the mothers gained and became more confident towards ANC services and institutions after every successive successfully conducted parturition and it shall be considered as welcoming step as increased parity is associated with increased chance of morbidities and mortalities among mothers including children. But this finding was incoherence with the studies done by Kaur *et al.*,^[22] and Gupta *et al.*,^[24] where there was decreasing trend was observed in the utilization of MCH services among mothers with higher parity.

In present study, a significant association was observed between usage of MCH services by mothers and socioeconomic status based on per capita monthly income. The studies by Gupta *et al.*,^[25] Sahni *et al.*,^[26] and Sangwan *et al.*^[27] have also shown the contrast in the usage pattern of ANC services among mothers from distinct socioeconomic status, where mothers from lower socioeconomic group were lagging behind in utilizing ANC services when compared to the mothers from middle or higher socioeconomic group.

Present study has revealed that there was significant difference in the utilization of the maternal health services among participants with different religion. Few default standards or laws of a religion set for women can bring defeatist attitude and behavior for usage of ANC services. In country like India with wide cultural and religious variations, approach which merges the religion representatives and health care representatives have an important role is bringing the change in attitudes and perceptions of society towards seeking health services. As discussed, religion has some or more influencing impact so, including and involving the religion members or organizations in MCH care services scheme or program can have beneficial effect on their utilization pattern.^[28-30]

The observations of present study are the analysis of data collection from primary source i.e. mothers which constitute the major strength of the study. Since the study being the quantitative and cross sectional in nature, it derives only association not causal relationship between various characteristics maternal health services utilization, which can be considered as limitation of study. The future studies shall also cover qualitative aspects such as quality analysis of service being provided, feedback of mothers to measure level of satisfaction for services being availed, role of health professionals and their perspective about MCH care services.

Conclusion

In the present study major determinants of a women which influence utilization of maternal health care service includes their age, literacy status, parity, socioeconomic status and occupation. The lower utilization of ANC among women less than 21 years raises a serious

Table 4: Association of the demographic characteristics with the Full ANC (N=632)

Variables	Full ANC		Test of significance
	Yes (n=74) Number (%)	No (n=558) Number (%)	
Age			
<21 years	6 (5.1)	111 (94.9)	$\chi^2=8.75$, df=3, $P=0.038$
21-30 years	43 (15.2)	240 (84.8)	
31-40 years	17 (11.0)	137 (89.0)	
>40 years	8 (10.2)	70 (89.8)	
Religion			
Muslim	26 (6.7)	361 (93.3)	$\chi^2=24.1$, df=1, $P=0.000$
Hindu	48 (19.6)	197 (80.4)	
Literacy status			
Illiterate	17 (4.5)	365 (95.5)	$\chi^2=98.5$, df=3, $P=0.000$
Primary	9 (8.3)	100 (91.7)	
Middle	26 (27.9)	67 (72.1)	
Higher or above	22 (45.8)	26 (54.2)	
Occupation			
Working	13 (15.5)	71 (84.5)	$\chi^2=1.26$, df=1, $P=0.262$
Housewife	61 (11.1)	487 (88.9)	
Spouse literacy status			
Illiterate	11 (4.9)	214 (95.1)	$\chi^2=21.6$, df=3, $P=0.000$
Primary	19 (10.9)	154 (89.1)	
Middle	26 (18.7)	113 (81.3)	
Higher or above	18 (18.9)	77 (81.1)	
Spouse occupation			
Working	36 (14.1)	217 (85.9)	$\chi^2=2.59$, df=1, $P=0.107$
Non-working	38 (10.0)	341 (90.0)	
Age at marriage			
<18 years	18 (7.4)	224 (92.6)	$\chi^2=6.92$, df=1, $P=0.009$
18 years or more	56 (14.3)	334 (85.7)	
Parity			
1	18 (9.6)	169 (90.4)	$\chi^2=2.99$, df=1, $P=0.224$
2	17 (9.9)	154 (90.1)	
3 or more	39 (14.2)	235 (85.8)	
Type of family			
Nuclear	38 (10.4)	327 (89.6)	$\chi^2=1.41$, df=1, $P=0.235$
Joint/Extended	36 (13.5)	231 (86.5)	
Socioeconomic status			
Class I	14 (22.2)	49 (77.8)	$\chi^2=16.8$, df=4, $P=0.002$
Class II	15 (19.4)	62 (80.6)	
Class III	28 (11.1)	225 (88.9)	
Class IV	11 (8.5)	118 (91.5)	
Class V	6 (5.4)	104 (94.6)	
Decision making capacity			
High	26 (30.5)	59 (69.5)	$\chi^2=37.3$, df=2, $P=0.000$
Moderate	16 (13.6)	101 (86.4)	
Low	32 (7.4)	398 (92.6)	

concern. Such determinants shall be considered for upcoming intervention aiming to bring attitudinal changes and concurrently leading to improved and enhanced usage of maternal health care services. Males being decision makers and their participation in health care delivery can easily affect and support the behavior of females to utilize the MCH services. Along with this if there are regular trainings of health staff and there is established institution with most of required facility complemented with proper implementation of in hand resources can bring down the mother and child deaths.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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