Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/9mfs8j95

AN ASSESSMENT OF QUALITY OF ANTENATAL CARE SERVICES AT PRIMARY HEALTH CENTRE'S AND SUB HEALTH CENTRE'S OF UDAIPUR DISTRICT.

Reshma Reja[1], Vandana Meena[2*], Gouri Mohammed Shadab[3], Atul kumar Gupta[4]

[1] Assistant Professor, Department of Community Medicine, Government Medical College, Kota
reshmareja@yahoo.com
[2*]Assistant Professor, Department of Community Medicine, Government Medical College, Kota
dr.vandae5576@gmail.com
[3] Associate Professor, Department of Community Medicine, Government Medical College, Kota
shadabgouri@gmail.com
[4] Junior specialist, Superspeciality hospital, Government Medical College, Kota
bannanakite@gmail.com

***Corresponding Author:** Dr. Vandana Meena
*Flat No B-702, Skyline apartment, Rajeev Gandhi Nagar, Kota-324005, Rajasthan, India.
Phone numbers: 9828425265 E-mail address : dr.vandae5576@gmail.com

ABSTRACT:
Introduction: Pregnancy-related deaths and diseases remain unacceptably high. Quality health care during pregnancy and child birth can prevent many of maternal and new born deaths. **Objectives:** To assess quality of Antenatal care services provided at Primary and Sub Health Centre's of Udaipur district and to assess the association of various socio-demographic factors on their utilization. **Material and methods-** A health facility based cross sectional descriptive study. **Results:-** All PHC's and SHC's had name and facilities displayed prominently. Most, (≥80%) PHC's fulfilled other requirements of infrastructure as per IPHS. Availability of Instruments/investigation materials and accessories for Antenatal checkup were almost 100%. Almost all, 38(95%) ANM at PHC's and at SHC's 78(97.5%) displayed adequate skills of prescribing treatment for ANC. In our study, more than half of the women 238 (58.0%) were in the 21-25 years age group. Hundred percent of women got their pregnancy registered in any health facility. Majority 244 (59.5%) of them were registered for pregnancy in 1st trimester still only 44 (38.9%) women had utilized full antenatal care during pregnancy. **Conclusion:** To conclude we can say that the infrastructure and functional equipment's at most of the Primary Health Centre's and sub-centre's were as per IPHS norms. The ANMs skills were limited to prescribing injection T.T. and Iron folic acid tablets only.

KEY WORDS:- Antenatal care, PHC, Udaipur,Quality

Manuscript:
Introduction:
As India strives towards achieving the Sustainable Development Goals progress in reducing maternal mortality becomes an important frontier. Any pregnant woman may develop life-threatening complications with little or no advance warning. So every pregnant women need access

to quality antenatal services to detect and prevent life threatening complications during child birth[1].According to WHO estimates in 2015, the global Maternal Mortality Rate (MMR) was 216 per 100000 live births. According to World Bank data, India's MMR was 174 per 100,000 live births in 2015[2]. Many of these deaths are preventable and many lives can be saved if quality care is provided to pregnant women during their antenatal period and high risk factors such as severe anemia, pregnancy-induced hypertension etc are detected on time and managed well [3]. India is still struggling with a high maternal mortality and morbidity compounded by low utilization of services. Presumably, there are socio-economic and demographic factors, which play an important role in the utilization of maternal health care services.[4]

Even with improved access to maternal health care services, MMR still remains high at 167/100000 live births[5,6].

Safe motherhood is still a dream for India as we are still far behind in achieving the Sustainable Development Goal (SDG) global target of less than 70 per lakh live births[7].According to **Annual Health Survey (AHS**) 2012-2013 MMR of Rajasthan is 208[8] and Rajasthan is the state with second highest number in maternal mortality in India. The Primary Health Centres (PHCs) are the cornerstone of rural healthcare. Primary health centres and their sub-centres act as the entry gate of the health services. Despite this, the availability of maternal health services in rural areas of Rajasthan remains poor because of low availability of skilled human resources. So there is a need to assess the quality of theses health centres situated in the remote areas of the district and address the lacunae associated with the services provided for the better service provision in future. A healthy entry will lead to a healthy exit, i.e. a healthy mother and a healthy child.

Objectives:

1. To assess the availability, comprehensiveness and quality of Antenatal care services provided at Primary and Sub Health Centres of Udaipur district.
2. To recommend plan for improvement of ANC services.

Material and Methods:

A health facility based cross sectional study using both qualitative and quantitative methods for data collection in urban, rural and tribal PHCs and SHCs of Udaipur district providing antenatal care services. Study Period was six months from June 2019 to November 2019.

Sampling Technique: Multistage sampling technique is used. There are total 12 Blocks in Udaipur district, six tribal, five rural and one urban. 30% of each block (One urban, two rural and two tribal blocks) were selected randomly by lottery method in first stage. The blocks thus selected were Girwa, Badgaon, Mavli , Rhishabdev and Jhadol (Phalasia). Selected urban block has 11 PHCs, rural blocks have 18 PHCs and tribal blocks have 11 PHCs. In second stage all PHCs (total 40) were selected (Eleven urban, eighteen rural and eleven tribal). In these selected blocks urban PHC has no sub centre but antenatal services were delivered at Anganwadi centres. In third and final stage two SHCs of each PHC (rural and tribal) and two AWC from each urban PHC were selected randomly. So total of 40 PHCs, 58 SHCs and 22 Anganwadi centres of urban PHC were selected for data collection.

Tool-1: Health Facility Survey- Records availability of material resources i.e. infrastructure and logistics. [9]

Tool-2: Direct Observation Studies- Measures quality of actual care provided [10].

For each study tool, I had prepared semi-structured checklist or questionnaire and defined a scale of quality measurement. Separate quality scores for antenatal care will be calculated for each tool and for each study site. For health facility survey, each single variable receives a score of '1' if the commodity is available and in good working condition or if the activity is observed and performed according to accepted standards of care and a score of '0' if this is not the case. For observation study data collecting instrument is a questionnaire cum checklist prepared on the basis of Standard Operating Procedures (SOPs) developed by the Director General Health Services (DGHS)[10].

Separate Observational Checklists, each for infrastructure and logistics and skills like Antenatal examination, measuring BP and laboratory testing for haemoglobin, urine albumin and sugar was used. The data from Observational Checklist was given score after assessing all the measurable elements and check points.

Technique: Each beneficiary was interviewed on the semi-structured questionnaire after ensuring privacy. Auxiliary Nurse Midwifery (ANMs) skills related to antenatal check up, identification and counseling was personally observed and scored by the investigator.

Data Analysis: Data was coded and entered on Microsoft excel sheet and analysis done on SPSS version 16. Binary coding was done for the components of skills observed on the checklist. Zero was assigned for each wrong step and one mark for each right step.. Chi square test was applied to compare characteristics, difference was ascertained as significant when p value was < 0.05.

Ethical considerations: The plan was submitted to the Ethical Committee of the institute and study was initiated only after ethical approval.

Results:

Table-1: Availability of Services for Antenatal checkup at PHC'S as per IPHS Norms.

Functional Equipments	Urban (n=11)		Rural (n=18)		Tribal (n=11)		Grand Total
	Yes	No	Yes	No	Yes	No	
Name and Facilities Displayed Prominently	11 (100)	0 (0)	18(100)	0 (0)	11 (100)	0 (0)	40 (100)
Schedule Board Displayed	10(90.9)	1 (9.1)	9 (50.0)	9 (50.0)	4 (36.4)	7 (63.6)	23 (57.5)
Separate Room for ANC	11 (100)	0 (0)	17 (94.4)	1 (5.6)	10 (90.9)	1 (9.1)	38 (95)
Privacy is Ensured in Examination Room	11 (100)	0 (0)	17 (94.4)	1 (5.6)	11 (100)	0 (0)	39 (97.5)
Counseling Facility	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Waiting Room	11 (100)	0 (0)	14 (77.8)	4 (22.2)	7 (63.6)	4 (36.4)	32 (80)
Separate Toilet	11 (100)	0 (0)	17 (94.4)	1 (5.6)	8 (72.2)	3 (27.3)	36 (90)
Separate Space Laboratory	11 (100)	0 (0)	15 (83.3)	3 (16.7)	7 (63.6)	4 (36.4)	33 (82.5)
Color Coded Waste Bins	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Registered Telephone Line	11(100)	0 (0)	13 (72.2)	5 (27.8)	5 (54.5)	6 (54.5)	29(72.5)
24 Hrs Electricity Backup	11 (100)	0 (0)	14 (77.8)	4 (22.2)	5 (45.5)	6 (54.5)	30 (75)

Figures in parenthesis are percentage

All PHC's had name and facilities displayed prominently and had Color coded Waste bins. Most, (≥80%) PHC's fulfilled other requirements of infrastructure as per IPHS. Only 23 (57.5%) had schedule board displayed. Majority >90% had separate room for antenatal checkup, privacy ensured during examination, counseling facility and separate toilets. Separate space for laboratory is available in 33 (82.5%) of PHCs.

Table-2: Availability of Instruments / Investigation Materials and Accessories for Antenatal Checkup at PHC'S as per IPHS Norms

Functional Equipments	Urban		Rural		Tribal		Grand Total
	Yes	No	Yes	No	Yes	No	
Height Measuring Scale	11 (100)	0 (0)	11 (61.1)	7 (38.9)	9 (81.8)	2 (18.2)	31 (77.5)
Weight Measuring Scale	11 (100)	0(0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Sphygmomanometer	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Stethoscope	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Thermometer	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Urine Albumin Detection Kit	11 (100)	0 (0)	16 (100)	2 (0)	11 (100)	0 (0)	38 (95)
Hb Detection Kit	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
IFA Tablets	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
TT Injection	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)
Ambulance Facility	11 (100)	0 (0)	18 (100)	0 (0)	11 (100)	0 (0)	40 (100)

Figures in parenthesis are percentage

Availability of Instruments/investigation materials and accessories for Antenatal checkup were almost 100% as per IPHS norm except height measuring scale which was available at 31 (77.5%) of PHCs.

Table-3: Subjects Displaying Adequate* Skills on Different Components of Essential Antenatal checkup at PHC

Components	No. of Subjects (n=40)	Percentage
History taking	22	55
Examination	20	50
Lab investigation	18	45
Treatment (IFA, Inj. TT)	38	95
Counseling and F/U	21	52.5
Referral	18	45

- scoring≥60%for all essential parts of the skill assessed on checklist.

Almost all, 38 (95%) subjects displayed adequate skills of prescribing treatment for ANC but only half of the subjects displayed adequate skills regarding history taking, examination, counseling and Follow up and less than half (≤ 45%) were skilled adequately for lab investigations and referral.

Table-4: Level of Essential Antenatal Checkup Skills of the Subjects at PHC

Level	Number of Subjects			(n=40)	P-Value
	Urban (n=11)	Rural (n=18)	Tribal (n=11)		
Good*	3 (27.27)	3 (16.67)	2 (18.18)	8 (20)	0.774
Average**	7 (63.63)	10 (55.55)	6 (54.54)	23 (57.5)	0.888
Below average***	1 (9.09)	5 (27.8)	3 (27.27)	9 (22.5)	0.457
Total	11 (100)	18 (100)	11 (100)	40 (100)	

Figures in parenthesis are percentage

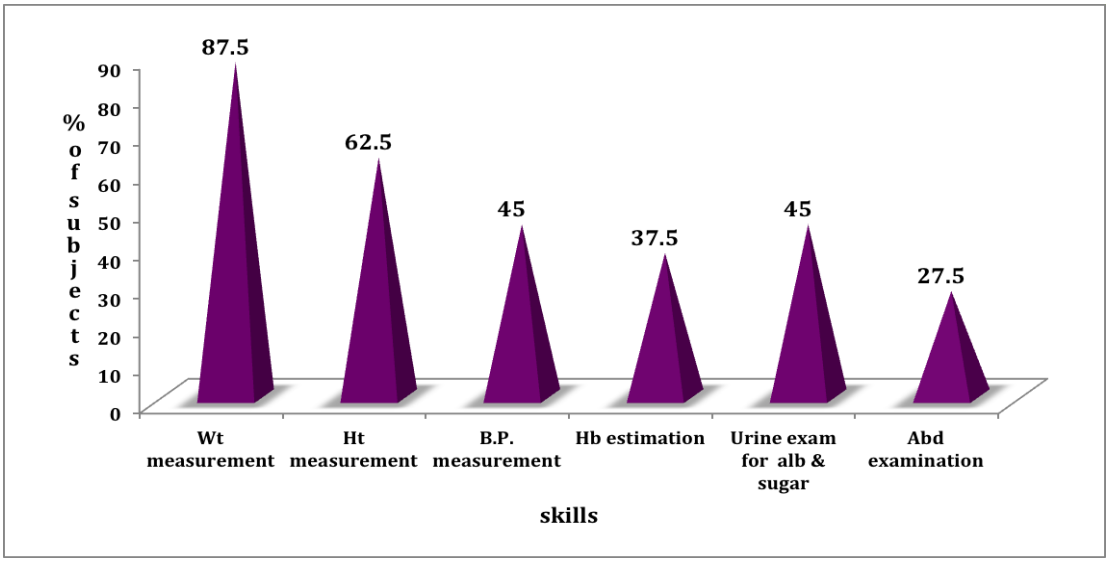
*Score 5-6, **Score 3-4, *** Score <3,

χ^2=1.723, df=4, P Value= 0.787

Majority, 23 (57.5%)of subjects displayed only average skills of essential Antenatal checkup. Skills displayed by 9 (22.5%) subjects were less than average.

A mere 8 (20%) displayed good skills, more urban 3 (27.27%) than rural 3 (16.67%) and tribal 2 (18.18%). The difference was not statistically significant. **(p value 0.787.**

Fig.1: Skills of Subjects in Identifying Signs and Symptoms of HRP in Antenatal Period at PHC.



* Adequate skill: Scoring >50% for all essential parts of the skill

Majority of subjects displayed adequate skill for weight 35 (87.5%) and height 25 (62.5%) measurement. Blood pressure and urine examination for albumin and sugar were adequately measured by 18 (45%) subjects. Only One third, 15 (37.5%) could estimate hemoglobin adequately. Abdominal examination was adequately done by only11 (27.5%) subjects.

Table-5: Skills* of Subjects in Identifying Signs and Symptoms of HRP in Antenatal Period at PHC

Level	Number of Subjects			(n=40)	P-Value
	Urban (n=11)	Rural (n=18)	Tribal (n=11)		
Good*	2 (18.18)	3 (16.67)	1 (9.09)	7 (17.5)	0.807
Average**	7 (63.63)	10 (55.56)	7 (63.63)	23 (57.5)	0.874
Below average***	2 (18.18)	5 (27.78)	3 (27.27)	10 (25)	0.828
Total	11 (100)	18 (100)	11 (100)	40 (100)	

Figures in parenthesis are percentage
*Score 5-6, **Score 3-4, *** Score <3,
χ^2=0.754, df=4, P Value= 0

Majority, 23 (57.5%) of subjects displayed only average skills in identifying s/s of HRP. Skills displayed by 10 (25 %) subjects were less than average.

A mere 7 (17.5%) displayed good skills, more in urban 2 (18.18%) than rural 3 (16.67%) and tribal 1 (9.09%). There was no significant difference in levels of skills between urban, rural and tribal subjects. (p value> 0.05).

Table-6: Availability of Services for Antenatal Checkup at SHCs and AWC's in Urban Block as per IPHS Norms

Services	Urban (n=22)		Rural (n=36)		Tribal (n=22)		Grand Total
	Yes	No	Yes	No	Yes	No	
Name and Facilities Displayed Prominently	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Schedule Board Displayed	16 (72.7)	6 (27.3)	30 (83.3)	6 (16.7)	14 (63.6)	8 (36.4)	60 (75)
Separate Room for ANC	2 (9.09)	20 (90.9)	31 (86.1)	5 (13.9)	19 (86.4)	3 (13.6)	52 (65)
Privacy is Ensured in Examination Room	11 (50)	11 (50)	34 (94.4)	2 (5.55)	18 (86.4)	4 (18.2)	63 (78.7)
Counseling facility	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Waiting Room	0 (0)	22 (100)	25 (69.4)	11 (30.5)	13 (59.1)	9 (40.9)	38 (47.5)
Separate Toilet	0 (0)	22 (100)	14 (38.9)	22 (61.1)	10 (45.4)	12 (54.5)	24 (30)
Separate Space for Laboratory	0 (0)	22 (100)	36 (100)	0(0)	10 (45.4)	12 (54.5)	46 (57.5)
Color coded Waste Bins	0 (0)	22 (100)	36 (100)	0 (0)	22 (100)	0 (0)	58 (72.5)
Registered Telephone Line	0 (0)	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)
24 Hours Electricity Backup	0 (0)	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)

*Figures in parenthesis are percentage

All SHCs had name and facilities displayed prominently and had Color coded Waste bins. Most, (≥80%) SHCs fulfilled other requirements of infrastructure as per IPHS. Urban PHC had no sub-centers and antenatal services are provided through Anganwadi centers which are lacking in necessary infrastructures like color coded waste bins, separate antenatal room, separate laboratory and toilet facility. Therefore privacy during examination and counseling is greatly compromised.

Schedule board displayed in 60 (75%) of SHCs.

Registered telephone line and 24 hours electricity backup was available in none of SHCs as well as urban Anganwadi centres.

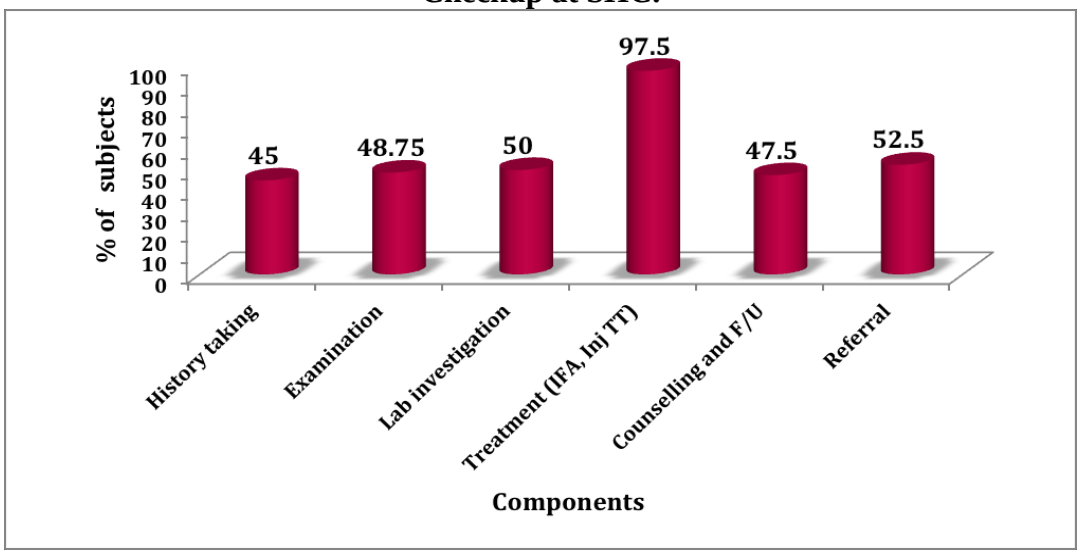
Table-7: Availability of Instruments / Investigation Materials and Accessories for Antenatal Checkup at SHCs as per IPHS Norms

Functional Equipments	Urban		Rural		Tribal		Grand Total
	Yes	No	Yes	No	Yes	No	
Height Measuring Scale	20 (90.9)	2(9.09)	28 (77.8)	8(22.2)	11 (50)	11 (50)	59 (73.75)
Weight Measuring Scale	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Sphygmomanometer	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Stethoscope	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Thermometer	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Urine Albumin Detection Kit	22 (100)	0 (0)	36 (100)	2 (0)	22 (100)	0 (0)	80 (100)
Hb Detection Kit	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
IFA Tablets	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
TT Injection	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)
Ambulance Facility (on call)	22 (100)	0 (0)	36 (100)	0 (0)	22 (100)	0 (0)	80 (100)

*Figures in parenthesis are percentage

Availability of Instruments/investigation materials and accessories for Antenatal checkup were almost 100% as per IPHS norm except height measuring scale which was available at 59 (73.75%) of SHCs.

Fig 2: Subjects Displaying Adequate* Skills on Different Components of Essential Antenatal Checkup at SHC.



➢ Scoring ≥60% for all essential parts of the skill assessed on checklist.

Almost all, 78 (97.5%) subjects displayed adequate skills of prescribing IFA and inj TT for ANC. Only 42 (52.5%) subjects displayed adequate skills regarding referral services and less than half (≤ 48.75%) were skilled adequately for history taking, examination, counseling, Follow up and lab investigations.

Table-08: Level of Essential Antenatal Checkup Skills of the Subjects at SHC

Level	Number of Subjects			Total (n=80)	P-value
	Urban (n=22)	Rural (n=36)	Tribal (n=22)		
Good*	4 (18.18)	5 (13.89)	2 (9.09)	11 (13.75)	0.681
Average**	16 (72.72)	25 (69.44)	15 (68.18)	56 (70)	0.636
Below Average***	2 (9.09)	6 (16.67)	5(22.73)	13(16.25)	0.470
Total	22 (100)	36 (100)	22 (100)	80 (100)	

Figures in parenthesis are percentage

*Score 5-6, **Score 3-4, ***Score <3,
χ^2=1.963, df=4, P Value= 0.743

Majority, 56 (70%) of subjects displayed only average skills of essential Antenatal checkup. Skills displayed by 13 (16.25%) subjects were less than average.

A mere 11 (13.75%) displayed good skills, more in rural 5 (13.89%) than tribal 2 (9.09%). The difference was not statistically significant. **(p value 0.743)**

Discussion:

The Maternal Mortality Ratio (MMR) of Rajasthan is 318 per one lakh live births, which is about four times to that of Kerala. MMR of the district is 388 (census 2011)[12], higher than the average MMR of the division. In present study all PHCs had name and facilities displayed prominently and had Color coded Waste bins. Most, (≥80%) PHCs fulfilled other requirements of infrastructure as per IPHS. Majority >90% had separate room for antenatal checkup, privacy ensured during examination, counseling facility and separate toilets. Separate space for laboratory is available in 33 (82.5%) of PHCs.

Availability of Instruments/investigation materials and accessories for Antenatal checkup were almost 100% as per IPHS norm except height measuring scale which was available at 31 (77.5%) of PHCs.

In contrast to our study, study conducted by **Ahmed M.S.A. Mansur, *et al*, December 2014**[13], concluded that out of 13 centres only 3 (23%) had sufficient instruments like stethescope, height measuring scale, sphygnomannometer, thermometer etc to render ANC services. In their study, among 13 centers, only 3 (23.1%) have sufficient instruments to render ANC services. Height measuring scale was not available in 9 (69.2%). Blood pressure machine was not available in 2 (15.4%) centers, one center lacked stethoscope, and two centers did not have thermometer.

All SHC's had name and facilities displayed prominently and had Color coded Waste bins. Most, (≥80%) SHCs fulfilled other requirements of infrastructure as per IPHS. Urban PHC had no subcenters and antenatal services are provided through Anganwadi centers which are lacking in necessary infrastructures like color coded waste bins, separate antenatal room, separate laboratory and toilet facility. Therefore privacy during examination and counseling is greatly compromised.
Availability of Instruments/investigation materials and accessories for Antenatal checkup were almost 100% as per IPHS norm except height measuring scale which was available at 59 (73.75%) of SHCs.

Antenatal care is provided to women for ensuring that pregnancy progresses smoothly. At the sub center level, essential antenatal care includes conducting an abdominal examination, measuring BP, measuring weight, estimating Hb levels, administering Tetanus Toxoid injection and giving Iron and Folic Acid tablets. **MP Sharma and SC Soni**[14] too observed that all subcentres had BP instrument, stethoscope, weighing machine and hemoglobinometer but some of these were unused.

ANMs at the SCs are the link between the health care system and the community. Their knowledge and practices can have a profound effect on pregnancy outcomes. Ensuring adequate knowledge of pregnancy complications by these health workers is essential. Almost all, 78 (97.5%) subjects displayed adequate skills of prescribing IFA and inj TT for ANC. Only 42 (52.5%) subjects displayed adequate skills regarding referral services and less than half (≤ 48.75%) were skilled adequately for history taking, examination, counseling, Follow up and lab investigations. This shows that essential ante-natal care has been limited to the provision of IFA tablets and TT injections only.

Conclusion:

From this study we concluded that the infrastructure and functional equipments at most of the Primary Health Centres and sub-centres were as per IPHS 2012 norms. The ANMs possessed good knowledge of essential ANC care and risk factors associated with pregnancy and danger signs in

antenatal period but their skills were limited to prescribing injection T.T. and Iron folic acid tablets only.

Financial support and sponsorship -- Nil

Conflicts of interest -- There was no conflicts of interest

References:

1. National Rural Health Mission, Maternal Health Division, Ministry of Health &Family Welfare, Government of India, Page No. 15 (Accessed on 24th October 2016).
2. Maternal mortality: fact sheet. Geneva: World Health Organization; 2016 (http://www.who.int/mediacentre/ factsheets/fs348/en/index.html. accessed 10 January 2018).
3. Pregnant woman – National Health Portal. Available at https://pmsma.nhp.gov.in, accessed on 20.6.2017.
4. World Health Organization. Making pregnancy safer: why is this issue important? 2004. Available from: http://www.who.millenium goalsformaternalhealth.htm.
5. Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), MOH & FW, GOI. Available athttps://www.pmsma.nhp.gov.in accessed on 05/07/2018.
6. Sample Registration System: Maternal Mortality Bulletin 2011-13, Ministry of Home Affairs, Government of India. Available at 'www.censusindia.gov.in/2011-common/sample_registration_ system.html
7. WHO | SDG 3: Ensure healthy lives and promote wellbeing for all at all ages. Accessible at https://www.who.int/sdg/targets /en/
8. Annual Health Survey, 2012-13, Govt. of India. Available at www.censusindia.gov.in, accessed on 06/07/1018.
9. Ahmed M.S.A. Mansur, *et al*: Quality of Antenatal Care in PHC of Bangladesh in journal of Family and Reproductive Health V.8 (4); 2014 December PMC 4266789; 175-181. 2014).
10. Quality Assurance Manual: Implementing Public Health Standards in Primary Health Centres. Director General of Health Services, Ministry of Health and Family Welfare, GoI. www.dghs.gov.in/index.aspx.
11. The Demographic & Health Scenario of Rajasthan from an Analytical Perspective, 2012, available at plan. Rajasthan. gov.in/.../The%20Demographic%20_%20health%20 Scenario%20of%2.accessed on 24/11/2018.
12. District Census 2011. Available at *http://www.census 2011.co.in*, accessed on 23/07/2017.
13. Census of India 2011 Rajasthan series-09 part xii-b district census handbook Udaipur village and town wise primary census abstract (pca) directorate of census operations Rajasthan, 2011. Available at www.censusindia.gov.in/.../dchb/0832_part_b_ dchb%20_0832_udaipur, Accessed on 25.11.2018.
14. MP Sharma, SC Soni, A Quality Assessment of Institutional Deliveries in Jaipur, Rajasthan, pg 22, available at www.nihfw.org>doc>jaipur accessed on 30.11.2017.