

ORIGINAL RESEARCH

A Cross Sectional Study of Utilization of Antenatal Health Care Seeking Behaviour Among Postnatal Women of Urban Area

¹Dr. Anil K Agarwal, ²Dr. Kirti Shrivastava, ³Dr. Madan Singh Gadariya, ⁴Dr. Ramniwas Mahore, ⁵Dr. Rahul Jhuriya

¹Professor, ^{2,3,5}PG (MD) Std, ⁴Associate Professor, Department of Community Medicine, G R Medical College, Gwalior, Madhya Pradesh, India

Corresponding Author

Dr. Ramniwas Mahore

Associate Professor, Department of Community Medicine, G R Medical College, Gwalior, Madhya Pradesh, India

Email: drmahore@gmail.com

Received: 13 September, 2023

Accepted: 15 October, 2023

ABSTRACT

Background: Antenatal care (ANC) is a vital component of maternal health aimed at ensuring a safe pregnancy for expectant mothers. Delays in recognizing pregnancy and the absence of appropriate health-seeking behavior are significant contributors to maternal morbidities and fatalities. **Aim:** This study aimed to assess the health-seeking behavior related to antenatal care services among both antenatal and postnatal mothers residing in an urban area of Gwalior city, Madhya Pradesh. **Materials and Methods:** We employed a community-based descriptive cross-sectional research design. A total of 350 mothers who had given birth within the past year were selected for the study. **Results:** Among the study participants, 88% received adequate antenatal care, defined as a minimum of four antenatal checkups. However, only 41.4% were knowledgeable about the warning signs during pregnancy. Maternal literacy and the extent of prenatal care received were identified as major determinants of this knowledge. In terms of health-seeking behavior, 30.3% preferred the district hospital for their delivery. Adequate prenatal care was found to be significantly associated with proper gestational weight gain, exclusive breastfeeding, appropriate weaning practices, and the consumption of iron and folic acid supplements. **Conclusion:** While there is a reasonable utilization rate of antenatal services, this study underscores the importance of providing health education to all pregnant women and expectant mothers regarding the warning signs of pregnancy and the significance of adequate prenatal care. This knowledge can empower them to recognize when and how to seek medical care, thereby contributing to a reduction in overall maternal morbidity and mortality

Key Words: Antenatal care, Care seeking behavior, Pregnancy & danger signs, Awareness, Urban

This is an open access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.

INTRODUCTION

The maternal mortality rate serves as a crucial indicator for evaluating the quality of obstetric care worldwide¹. Globally, an alarming 800 women succumb daily to preventable complications linked to pregnancy and childbirth². Tragically, 99% of these maternal deaths occur in developing countries, disproportionately affecting rural areas and impoverished communities³. In India, the maternal mortality rate stands at a concerning 174 deaths per 100,000 live births, posing a significant public health challenge⁴. Ensuring comprehensive maternal care is paramount to safeguarding the well-being of women and their newborns⁵. An essential aspect of this care is understanding healthcare-seeking behavior, encompassing the perception of symptoms, action-

taking, and the timing and type of healthcare services accessed⁶. Andersen's health behavior model underscores the influence of individual characteristics and healthcare needs on a person's motivation and ability to access healthcare services, with overall utilization being impacted by population characteristics and their environment⁷. It was found that about 88%-98% of all maternal deaths could be avoided by proper care and handling during pregnancy and labor. As per WHO recommendations 4- visit ANC should be necessary for lowering the risk of pregnancies. Antenatal care (ANC) services are considered to be the key element in the primary health care delivery system of a country⁸

Antenatal care is the care given to pregnant women so that they have safe pregnancy and healthy baby⁹. The

provision of antenatal care (ANC) services brings with it a positive impact on pregnancy as it enables the identification of risk factors and early diagnosis of pregnancy complications like preterm delivery and appropriate management¹⁰. In spite of all efforts made under reproductive & Child Health Programme (RCH 1 & 2), the obstetrics care service utilisation is lagging behind and shows big gaps in the outcome. The services provided by the Government through these programmes would succeed only if it is available to the people at the right time, at the right place and the services must be affordable and accessible. Most of the maternal deaths which occur during pregnancy and labour are due to lack of awareness and delay in the identification of pregnancy complications, delay in decision making of when to seek medical care, delay in choosing the appropriate health facility and receiving adequate and appropriate treatment at the right time^{3,11}.

According to the latest National Family Health Survey (NFHS-4), the total percentage of antenatal women who had adequate antenatal visits was only 51.2%, clearly indicating the underutilisation of health services¹². This could in turn lead to increased maternal morbidity and mortality due to under diagnosis of maternal health problems and lack of awareness in child care practices, like exclusive breastfeeding and proper weaning practices. Health seeking behaviour and the utilization of health care among antenatal women are influenced by multiple factors like women's education, socio-cultural factors, decision-making authority regarding her reproductive health care, birth order and her socio-economic status¹³. In order to develop effective and appropriate health policies regarding RCH care in a community, it is necessary to understand the health seeking behaviour, birth preparedness and complication readiness among antenatal and postnatal mothers to evaluate and identify the gaps in the existing health system¹².

Health care service utilization is a key proximate determinant of maternal and infant outcomes¹⁴. It is evident that well-timed ANC utilization is an opportunity to prevent the direct cause of maternal and neonatal deaths related to obstetric complication and can improve certain outcomes of pregnancy complications¹⁵. Based on this background, this study was planned and carried out in a urban area Gwalior district with the objective to find out the health seeking behaviour among the antenatal and postnatal mothers and its association with socio-demographic characteristics of the study participants.

MATERIAL S AND METHODS

This community-based cross-sectional study was carried out in the urban area of Gwalior district of Madhya Pradesh. The study was carried out from 1st October, 2022 to 30th April, 2023 and study subject was 350 mothers of selected clusters, who had delivered within last one year, who was a

resident of the study area. Multi-indicator cluster survey (MICS) was done with 30 clusters sampling method, proposed by the WHO, which is a standard method for rapid assessment of coverage evaluation¹⁶. Sample size was calculated by using the formula $n = Z^2 pq/d^2$ (where $Z=1.96$ at 95% confidence; $p=ANC$ utilization; $q=1-p$; $d=$ absolute allowable error. For this study we presumed maximum variability (82%) and minimum allowable error 5% of p (according to health and welfare statistics 2019-20¹². taking design effect of two, the required sample size was 350. For a 30 cluster technique, number of subjects to be selected per cluster $350/30=11.7$. So we have to select 30 clusters, each with 11 or 12 mothers making a total sample size of 350. This study was carried out with the help of Aganwadi workers of ICDS project. The 30 clusters were selected on the basis of systematic random sampling from the probability of the cluster selection based on the population size of the cluster then data collection was done with the help of Aganwadi workers on house to house basis till the desired sample size was achieved. A pretested structured questionnaire was used for interview mothers who delivered within last one year used to collect required information. Before starting study approval was obtained from the Institutional Ethics Committee and data were collected after obtaining informed consent from mother. The questionnaire consisted of two parts. First part recorded the socio demographic information including age of mother; education of mother, occupation of mother, type of family, family size, cast, family income, education of husband and occupation of husband and socioeconomic status (Social classification update by Agarwal¹⁷) and household decision-making autonomy as predictor variables of maternal health care seeking behaviour. Second part of questionnaire was information about utilization of ANC services and awareness about danger signs of pregnancy and knowledge about exclusive breast feedings. Adequate utilization of ANC services was considered, if the mother received at least four antenatal check-up visits to the health facility including early registration (ANC registration within 12 weeks/ first trimester of pregnancy), two doses/booster doses of tetanus toxoid (TT) injection and consumption of 100 or more iron folic acid (IFA) tablets during pregnancy. Data collected was entered into MS Excel and then analysed using epi info software. Percentages, means, standard deviation (SD), chi-square (χ^2) tests and odds ratio (OR) were calculated with applying logistic regression model and p .

INCLUSION CRITERIA

All currently married women having children of \leq one year of age comprised of study population.

EXCLUSION CRITERIA

Mothers not included who was not willing to cooperate, not available during the time of data

collection and women having children of more than one year of age.

RESULTS

The following section outlines the results of the study conducted to assess the health-seeking behavior of the participants in the study area concerning obstetric care services.

Table 1 presents the sociodemographic characteristics of the study participants. Approximately 52.8% of them fell within the age group of 21–29 years. In

terms of educational attainment, 57.1% of the participants had completed education up to the secondary school level, while 62.0% of their spouses had a similar level of education. Utilizing Agarwal's Social Classification¹⁷, 59.4% of the participants were categorized as middle class, with 22.2% falling into the lower class category. Furthermore, 63.4% of the study participants were part of nuclear families, and the majority practiced Hinduism, accounting for 59.7% of the participants.

Table1. Socio -Demographic characteristics of the study participants (N=350)

Socio Demographic Variables		Frequency No (%)
Age in yrs.	<20	47(13.4)
	21-29	185(52.8)
	30-39	87(24.8)
	40-49	31(8.8)
Socio-Economic Status	I (Upper Class)	10 (2.8)
	II (Upper middle Class)	54 (15.4)
	III (Middle Class)	208 (59.4)
	V (Lower Class)	78(22.2)
Education of Mother	Illiterate	21(6.0)
	Up to middle	94(26.8)
	Up to Secondary	200(57.1)
	Graduate or above	35(10.0)
Education of husband	Illiterate	14(4.0)
	Up to middle	72 (20.6)
	Up to Secondary	217(62.0)
	Graduate or above	47(13.4)
Occupation of mother	Housewife	261(74.5)
	Business	22(6.3)
	Government and Private Job	67(19.1)
Religion	Hindu	209(59.7)
	Muslims	56(16.0)
	Others (include Sikh, Jain, Christian)	85(24.3)
Type of Family	Nuclear	222(63.4)
	Joint	128(36.6)

Table 2 presents the health-seeking behaviors and pregnancy characteristics of the study participants. The data revealed that approximately 30.3% of the participants expressed a preference for district or tertiary hospitals for a safe delivery. When it came to antenatal care, 62.0% of the participants indicated that their husbands made the decision regarding the place of delivery for their child, with only 7.1% having health workers accompanying them to health centers.

Table 2: Health seeking behavior and pregnancy characteristics of study participants (N=350)

Characteristics		Frequency n(%)
Preferred place of delivery	Sub centre	129(3.8)
	PHC/CHC	55(15.7)
	District/ tertiary	106(30.3)
	Private Clinic	60(17.1)
Adequacy of prenatal care	Inadequate	42(12.0)
	Adequate	308(88.0)

A significant majority of the study participants received both iron and folic acid (IFA) tablets (91.7%) and tetanus toxoid (TT) injections (92.8%).

Approximately 88.0% of the participants received adequate prenatal care, while only 42.0% achieved the recommended gestational weight gain of 9-11 kg during pregnancy. In most cases (64%), deliveries were overseen by medical doctors, with caesarean section deliveries accounting for 29.1% of the total

Health Care Worker accompanied to health facility for obstetric care	Yes	25(7.1)
	No	325(92.9)
Decision making regarding the place of birth	Husband	217(62.0)
	Mother-in-law	82(23.4)
	Mother	11(3.1)
	Health care provider	33(9.4)
	Close relatives	7(2.0)
	Self	14(4%)
Received IFA tablets	Yes	321(91.7)
	No	29(8.3)
Received TT injection	Yes	325(92.8)
	No	25(7.2)
Number of Conception	One	144(41.1)
	Two	115(32.9)
	Three and above	91(26.0)
Adequacy of gestational weight gain (9-11 kg)	Adequate	147(42.0)
	Not Adequate	203(58.0)
Distance to health facility	<30 Minute	283(80.9)
	30-60 Minute	67(19.1)
Delivery conducted by	Doctor	224(64.0)
	Nurse	87(24.9)
	ANM/MPW	39(11.1)
Mode of delivery	Normal delivery	248(70.9)
	Caesarian	102(29.1)

Table 3 shows the awareness of danger signs of pregnancy among study participants. To assess the pregnancy complication readiness, the study participants were enquired about the danger signs of pregnancy. The most common danger signs for which they were aware excessive bleeding from vagina (88.0%) and early rupture of bag of water (90.3%) and high fever (88.9%). only 2.0% of the participants were aware that fever with blurring of vision was a danger sign during pregnancy. The awareness regarding

danger signs like slow progress of labour >12 hours and fits with severe pain in abdomen were found to be very low. When assessing the awareness regarding the danger signs of pregnancy, those who were able to give a correct answer to a minimum of 6 questions out of the 12, were regarded as having adequate knowledge regarding the danger signs of pregnancy. Thereby, around 36% of the study participants were found to be having adequate knowledge regarding the danger signs of pregnancy.

Table 3- Awareness of danger signs of pregnancy among study participants (N=350)

Danger Signs	Frequency* No. (%)
Bleeding from vagina before 37 weeks	241(68.9)
Severe pain in abdomen	252(72.0)
Breathlessness	42(12.0)
Swelling in face or body	56(16.0)
Reduced fetal movements	287(82.0)
High fever	311(88.9)
Malpresentation	28(8.0)
Slow progress of labor more than 12 h	39(11.1)
Excessive bleeding from vagina	322(92.0)
High fever with blurring of vision	7(2.0)
Fits with severe pain in abdomen	35(10.0)
Early rupture of bag of water	316(90.3)
*Multiple response for each variable	

To assess awareness regarding pregnancy danger signs, individuals who correctly answered at least 6 out of the 12 questions were considered to have adequate knowledge. Table 4 presents the association between awareness of pregnancy danger signs and antenatal care utilization among study participants.

The highest odds (29.6, $p=0.001$) were observed in participants with adequate antenatal care awareness of reduced fetal movements, followed by other conditions, such as early rupture of the amniotic sac (12.1, $p=0.001$), severe abdominal pain (11.7, $p=0.001$), and vaginal bleeding before 37 weeks

(11.2, $p=0.001$). Overall, there was a statistically significant difference in awareness among participants receiving adequate or inadequate antenatal care regarding pregnancy danger signs ($p=0.001$).

Among the study participants, it was found that individuals over 40 years of age had 8.1 times higher odds of having adequate knowledge about pregnancy danger signs, but this association was not statistically significant ($p=0.079$). Literate participants were three

times more likely to possess adequate knowledge about pregnancy danger signs (OR: 3.2, 95% CI: 1.3-7.8), and this association was statistically significant ($p=0.016$). Participants belonging to the upper class who received adequate prenatal care had 3.9 times increased odds of being more aware of pregnancy danger signs (OR: 3.9, 95% CI: 0.21-7.1), although this result was not statistically significant ($p=0.51$). [Table 5]

Table 4: Awareness of danger signs of pregnancy among study participants according to antenatal care utilization

Danger Signs	Awareness about Danger Signs	Adequate Antenatal Care N=308 No (%)	Not Adequate Antenatal Care N=42 No (%)	Odds ratio (95% CI)	P value
Bleeding from vagina before 37 weeks	Yes	232(75.3)	9 (21.4)	11.2 (5.1 to 24.4)	0.001*
	No	76(24.7)	33(78.6)		
Severe pain in abdomen	Yes	242(78.5)	10(23.8)	11.7 (5.4 to 25.1)	0.001*
	No	66(21.4)	32(76.2)		
Breathlessness	Yes	38(12.3)	4(9.5)	1.3(0.4 to 3.9)	0.784
	No	270(87.7)	38(90.5)		
Swelling in face or body	Yes	52(16.9)	4(9.5)	1.9(0.66 to 5.4)	0.35
	No	257(83.1)	37(91.5)		
Reduced fetal movements	Yes	278(90.3)	10(23.8)	29.6 (3.2 to 66.2)	0.001*
	No	30(9.7)	32(86.2)		
High fever	Yes	290(94.1)	21(50.0)	16.1(7.4 to 34.7)	0.001*
	No	18(6.9)	21(50.0)		
Malpresentation	Yes	27(8.8)	1(2.4)	3.9 (0.5 to 29.7)	0.184
	No	281(91.2)	41(97.6)		
Slow progress of labor more than 12 h	Yes	36(12.1)	3(4.8)	1.9(0.4 to 8.3)	0.385
	No	271(87.9)	39(95.2)		
Excessive bleeding from vagina	Yes	292(94.8)	30(71.4)	7.3(3.1 to 16.8)	0.001*
	No	16(5.2)	12(28.6)		
High fever with blurring of vision	Yes	7(2.2)	0(0)	2.1(0.1 to 37.6)	0.610
	No	301(97.8)	42(100)		
Fits with severe pain in abdomen	Yes	32(10.4)	03(7.1)	1.5 (0.4 to 5.1)	0.513
	No	278(89.6)	39(92.9)		
Early rupture of bag of water	Yes	292(94.8)	24(57.1)	12.1 (5.6 to 26.3)	0.001*
	No	18(5.2)	18(42.9)		
P= 0.001*					
* Statistically Significant					

Table 5: Association between knowledge regarding the danger signs of pregnancy and related variables

Characteristics of the Participants		Adequate knowledge regarding the danger signs of pregnancy (N=145) n (%)	Inadequate knowledge regarding the danger signs of pregnancy (N=205) n (%)	Odds ratio (95% CI)	P Value (χ^2 Test)
Age (Yr)	<20	15(31.9)	32(68.1)	1	0.079
	20-29	70(37.9%)	115(62.1%)	1.9 (0.83:4.33)	
	30-39	41(47.1%)	46(52.9%)	2.7(0.97:7.31)	
	40-49	19(61.3%)	12(38.7%)	8.1(0.98:7.31)	
Literacy Status	Illiterate	02(9.5)	19(90.5)	1	0.016*
	Literate [®]	143(43.4)	186(56.6)	3.2(1.3:7.8)	
Type of family	Nuclear	194(87.4%)	28(12.6%)	1	0.08
	Joint	114(89.1%)	14(10.9)	1.2(0.59:2.32)	
Socio-econo	I (Upper Class)	10(100.0)	0(10.0)	3.9(0.21 to 7.1)	0.51

mic status	II (Upper middle Class)	48(88.9)	6(11.1)	1.4(0.50 to 4.1)
	III (Middle Class)	184(88.5)	24(11.5)	1.4(0.65to 2.9)
	IV (Lower Class)	66(84.6)	12(15.4%)	1
*Statistically Significant (P>0.05) @all literacy sub classification merged				

Table 6 provides insights into the breastfeeding and weaning practices of the study participants. In terms of breastfeeding practices, it was observed that 81.4% of the participants initiated breastfeeding within one hour of birth, with 70% exclusively breastfeeding. Furthermore, 25.1% began weaning their infants before they reached six months of age. Among postnatal mothers, it was found that those who

received adequate prenatal care had increased odds of achieving adequate gestational weight gain (OR: 2.24), practicing exclusive breastfeeding (OR: 2.13), adhering to healthy weaning practices (OR: 3.79), and completing the full course of iron and folic acid (IFA) medication (OR: 9.8). The association between these characteristics and receiving adequate prenatal care was statistically significant ($P < 0.05$).

Table 6: Association of adequate prenatal care and certain characteristics among postnatal women

Characteristics		Adequate prenatal care (N-308) n(%)	Inadequate prenatal care (N-42) n(%)	Odds ratio (95% CI)	P value
Adequacy of weight gain during pregnancy	Adequate (203)	186(91.6)	17(8.4)	2.24(1.2:4.3)	0.022
	Not Adequate (147)	122(83)	25(17)		
Consumed IFA tablets	Yes (321)	293(91.3)	28(8.7)	9.8 (4.3:22.2)	0.001
	No (29)	15 (51.7)	14 (48.3)		
Early initiation of breastfeeding	Yes (n=285)	272 (95.4)	13 (4.5)	16.8 (8.0; 35.3)	0.001
	No (n= 65)	36 (55.4)	29 (44.6)		
Exclusive breastfeeding	Yes (n= 245)	222(89.8)	23(11.2)	2.13 (1.1:4.1)	0.034
	No (n= 105)	86 (83.8)	19 (16.2)		
Weaning started	Before 6 months (n=88)	67(76.1)	21(23.9)	3.79 (1.9 7.4)	0.009
	After 6 months (n= 262)	242(92.4)	20(7.6)		

DISCUSSION

Maternal mortality stands as a significant public health challenge in our nation. However, it can be mitigated through effective birth preparedness, increased awareness of pregnancy complications, and the promotion of proactive health-seeking behaviors among women. Numerous studies carried out in various countries have examined the demographic and socio-cultural factors influencing the utilization of antenatal care. The World Health Organization (WHO)¹⁸ recommends a four-visit antenatal care (ANC) schedule for low-risk pregnancies. In India, these ANC visits typically encompass essential components such as iron supplementation, blood and urine tests, administration of at least two Tetanus Toxoid (TT) injections, blood pressure monitoring, treatment for intestinal parasites, and educational sessions addressing pregnancy-related issues and the early detection of conditions that may render the pregnancy high-risk¹⁹.

The Most (52.8%) of the women in our study were in the age group of <30 years where Gupta et al in a study found that 58% of women in the age group of 20-26 years.¹¹ In the present study majority (74.8%) of the study population was belong to middle class and 6% were illiterate, 84% had attended secondary school which is comparable to the findings of Srivastava A²⁰, Gupta et al²¹. who had reported 67% and 74%. From this study, it was found that adequate

knowledge regarding the danger signs of pregnancy was present in only 36% of the study participants. In studies done by Gopalakrishnan and Rama²² and Acharya et al.²³, Around 46% and 41% of the participants had adequate knowledge regarding the danger signs and complications of pregnancy and in a study done by Gopalkrishan S et. al²⁴. and Dave et al.²⁵, and it was found to be only 24% and 8% respectively. These variations may have been due to the level of literacy status and health-seeking behaviour of the participants in the respective study areas. It was found that the study participants who were >40 years of age had a proportionately higher knowledge regarding danger signs of pregnancy (61.3%) when compared to those who were <40 years of age (47.1%) but the association was also found to be statistically significant. This may be due to the fact that those who were >40 years of age would have been well informed about pregnancy and its complications. These findings are contradictory to the findings by Gopalkrishan S et. al²⁴, Akshaya and Shivalli²⁶ and Ghosh et al.²⁷, where they found that the maternal age did not play a role in the adequacy of knowledge regarding the BPACR.^{24, 26, 27} This may be attributed to the better literacy status and better reach of the RCH services in this study population.

Among the study group, nearly 94% of the study participants and their husband had a minimum education of primary school and around 84% of them

had an education up to secondary school. Similar results were obtained in a study done by Gopalkrishan S et. al.²⁴, Akshaya and Shivalli²⁶. There was a statistical significant association found between maternal literacy and adequate knowledge regarding the danger signs of pregnancy ($P=0.016$). Similar results were found in a study carried out by Gopalkrishan S et.al²⁴ and Agarwal *et al.*²⁸ These findings highlight the fact that literacy level plays a major role in determining the BPACR (Birth preparedness and complication readiness) among participants. Regarding the health seeking behaviour of the study participants, 30.3% of the study participants preferred district hospital as their preferred place of delivery. On the contrary Gopalkrishan S et. al²⁴, Jain *et al*²⁹. found that the preferred maternal health seeking behaviour was from the PHC 62% & 68% respectively. Abdulrida et al.³⁰ in Baghdad also found that about 55.2% of the mothers sought care from government PHCs. The better utilization of the district hospital in this study may be due to the attractive referral benefits provided by the government schemes through primary health care to district hospital, better institution and outreach services, free medications and treatment. The majority of the study participants belonging to the middle class and they have better access to these facilities. Majority of the study participants received the IFA tablets (91.7%) and TT injection (92.8%) during the course of their pregnancy period. Similar findings were obtained in a study done by G, Vincent et al., where among the postnatal mothers, 94.3% and 82.4% of them consumed IFA tablets for >90 days.^{24,31} Non-compliance in the IFA medication in some of them would have been due to the adverse effects like nausea and vomiting and not received due to unawareness. Similar findings were obtained in studies conducted by Jha et al.³² and Kotecha et al.³³ & survey made by International Institute for Population Sciences India in 2005-2006³⁴. This shows the efficacy of these services and awareness among the participants. Regarding the final decision making on choosing the place of birth, it was found that husbands (62.0%) were the major decision makers and they were the ones accompanying their wives to the health care facilities for seeking obstetric care. This shows the influential role of the husband in today's society, especially in the study area. These findings were similar to the study conducted by Gopalkrishan S et. al.²⁴ and Qureshi et al.³⁵ The docile nature of the pregnant mothers can lead to many of their complaints or illness being looked down by their husband and his family members which could in turn lead to increase in their morbidity. Women have little preference in the family; hence they have to rely on their husband and family members (mostly in laws) to take any decision. It is even more important for the women to make their own choices and decisions based on the adequate information of the services they use as per their personal, family, and social needs.

Studies have revealed that both economic status and social dynamics regarding distribution of power between spouses have an influence on the use of maternal health services.³⁶ In our study, around 75.0% of the respondents belonged to a nuclear family. This was contrary with the study³¹ done in the Mid-Western region of the country where 58.2% of the mothers belonged to a joint family and in the study carried in Nepal³⁷ was 63.4% in joint family. This difference may be due to our study was carried in urban participants, where nuclear family concept is more dominant. It is often seen that a good marital relationship between spouses exists when they live in nuclear families results in better utilization rates of the ANC services during pregnancy³⁸. Men and their supportive role are pivotal in improving the lives of women. However, engaging men in maternal health programs presents a significant challenge in India, where the society is predominantly male-centric. To address this, it's crucial to ensure the effective dissemination of knowledge about maternal healthcare to husbands and parents-in-law, and to make it mandatory for husbands to be present during antenatal care visits. This approach can foster greater male involvement in the utilization of maternal health care services³⁹.

Notably, approximately 88.0% of the participants in our study received adequate prenatal care corresponding to their gestational age. Similar findings were reported in studies conducted by Gopalkrishan S et al.²⁴ and Jha et al.³², while studies in rural settings by Ghosh et al.²⁷ and Saha et al.⁴⁰ revealed contradictory results, with only 50% and 60% of participants having adequate antenatal visits, respectively. These disparities may be attributed to variations in the socio-demographic characteristics of the study participants and differences in the availability and accessibility of healthcare services in the respective study areas.

It is a known fact that gestational weight gain is an important prognostic indicator for a healthy mother and a healthy child.⁴¹ Among the study participants; it was found that 42.0% of them had adequate gestational weight gain. There was a statistically significant association (OR 2.24(1.2:4. P=0.022) found between adequate gestational weight gain and adequate prenatal care (in the terms of antenatal visits). Our findings has been found similar to Gopalkrishan S et.al²⁴ and a study done by Yeo et al.⁴², where also found significant association between adequate gestational weight gain and adequate prenatal care. Regarding the breastfeeding practices among the postnatal mothers in the study population it was found that around 70% of them practiced exclusive breastfeeding and there was a statistically significant association (OR=2.13 (95% CI: 1.1,4.1, P=0.034) found between practice of exclusive breastfeeding and adequacy of antenatal visits. These findings are similar to the study conducted by Gopalkrishan S et.al²⁴, Deepanrajan et al.⁴³ This

shows that peripheral health workers and social media play a major role in creating awareness about exclusive breastfeeding practices among antenatal and postnatal mothers.

Madhya Pradesh is not in the forefront of delivering the RCH services through the better established health care delivery system, particularly due to vast and difficult outreach of participants to health facilities, so the level of knowledge among the target group about the essential and emergency obstetrics services provided as part of the BPACR needs to be improved for better utilisation of the services provided.²² Studies conducted in different part of India found that the overall BPACR index indicating birth preparedness to be ranging from as low as 34.5% to 71.5% and 79.3%.^{26,44} Hence a comprehensive birth plan/emergency preparedness plan should be seriously implemented through the existing RCH network of services. The emergency preparedness plan should include the identification of the following: knowledge of key danger signs; desired place of birth; preferred birth attendant; location of the closest appropriate health care facility; funds for birth related and emergency expenses; a birth companion; transport to a health facility for the birth; transport in the case of an obstetric emergency; and identification of compatible blood donors in case of emergency.³ This will help in better health-seeking behaviour among the target population for maximizing the service utilization and reduce maternal and infant morbidity and mortality.

CONCLUSION

Antenatal care plays a vital role in ensuring safe motherhood. The study findings indicate that the overall utilization of antenatal health services is commendable, with over two-thirds of mothers making use of these services. However, it's noteworthy that only 36% of the study participants possessed adequate knowledge about pregnancy danger signs. This study underscores the importance of adequate prenatal care as a key factor influencing healthy gestational weight gain and proper breastfeeding practices. While the government has implemented necessary initiatives to enhance maternal health through programs like RCH and BPACR, the ultimate determinant of success is the effective utilization of these health services, a factor that hinges on the health-seeking behavior of pregnant mothers.

LIMITATIONS

Limitation of this study is that the results of this study could not be generalised to general population as the sample size was chosen from the urban field practice area as per convenience, covering a small geographical area.

FINANCIAL SUPPORT AND SPONSORSHIP

Nil.

CONFLICTS OF INTEREST

There are no conflicts of interest.

REFERENCES

1. Feijen-de Jong EI, Jansen DE, Baarveld F, Boerleider AW, Spelten E, Schellevis F, Reijneveld SA. Determinants of prenatal health care utilisation by low-risk women: a prospective cohort study. *Women Birth*. 2015; 28:87–94
2. World Health Organisation. Maternal Mortality – Factsheet. 2014. Available from: http://apps.who.int/iris/bitstream/handle/10665/112318/WHO_RHR_14.06_eng.pdf;jsessionid=C9B41DE3F35BF6EE657F1B815CAADF66?sequencenumber=1. [Last cited on 18 Oct 2021].
3. JHPIEGO. Monitoring birth preparedness and complication readiness. Tools and indicators for maternal and newborn health. 2004. Available from: http://reprolineplus.org/system/files/resources/bpccr_monitoringtools.pdf. [Last cited on 15th Aug 2023].
4. The World Bank. Maternal Mortality Ratio. 2015. Available from: <https://data.worldbank.org/indicator/SH.STA.MMRT>. [Last cited on 15th Oct 2021].
5. Raatikainen K, Heiskanen N, Heinonen S. Under-attending free antenatal care is associated with adverse pregnancy outcomes. *BMC Public Health*. 2007; 7:268]
6. Loue S. Handbook of immigrant health, 1 edn. New York: Springer science + business media, LLC; 2013. 6.]
7. Andersen R. Revisiting the behavioral model and access to medical care: does it matter? *J Health Soc Behav*. 1995; 36:1 –10]
8. World Health Organization Antenatal Care. 2015. [Accessed March 20, 2021]. Available from: http://www.who.int/gho/maternal_health/reproductive_health/antenatal_care_text/en/
9. Abosse Z, Woldie M, Ololo S. Factors influencing antenatal care service utilization in Hadiya zone. *Ethiop J Health Sci*. 2010; 20.
10. Perumal N, Cole DC, Ouédraogo HZ, et al. Health and nutrition knowledge, attitudes and practices of pregnant women attending and not-attending ANC clinics in Western Kenya: a cross-sectional analysis. *BMC Preg Childbirth*. 2013; 13:1.]
11. Acharya AS, Kaur R, Prasuna JG, Rasheed N. Making pregnancy safer-birth preparedness and complication readiness study among antenatal women attendees of a primary health center, Delhi. *Indian J Community Med* 2015; 40:127-34.]
12. HEALTH AND FAMILY WELFARE STATISTICS IN INDIA 2019 ... available on <https://main.mohfw.gov.in> [Last access to 28th Sep2023]]
13. Celik Y. The socio-economic determinants of alternative sources of antenatal care in Turkey. *Int J Health Plann Manage* 2000; 15:221-35.
14. Reynolds HW WEL, Tucker H (2006) Adolescents' use of Maternal and Child Health Services in Developing Countries. *Int Perspect Sex Reprod Health*. 23: 6-16.
15. International family planning perspectives. Adolescents' use of maternal and child health services in developing countries. 23: 6-16]

16. Henderson RH, Sundaresan T. Cluster sampling to assess immunization coverage: a review of experience with a simplified sampling method. *Bull World Health Organ.* 1982; 60:253-60]
17. Agarwal, Ak. "Social classification: the need to update in the present scenario." *Indian journal of community medicine* vol. 33, 1 (2008): 50-1. doi:10.4103/0970-0218.39245]
18. World Health Organization, "WHO recommendations on antenatal care for a positive pregnancy experience," 2016, <http://apps.who.int/iris/bitstream/handle/10665/250796/9789241549912-eng.pdf?Sequence=1>.
19. Ministry of Health and Population, "Annual report Department of Health Services 2066/67 (2009/2010)," 2011, <http://dohs.gov.np/wpcontent/uploads/AnnualReport206667.pdf>.
20. Gupta A, Chhabra P, Kannan AT, Sharma G. Determinants of Utilization Pattern of Antenatal and Delivery Services in an urbanized village of East Delhi. *Indian J Prev Soc Med.* 2010;41:3-4.
21. Srivastava A, Mahmood SE, Mishra P, Shrotriya VP. Correlates of Maternal Health Care Utilization in Rohilkhand Region, India. *Ann Med Health Sci Res.* 2014;4(3):417-25.]
22. Gopalakrishnan S, Rama R. Assessment of knowledge regarding 'essential obstetrics care' among rural pregnant women in Kancheepuram District of Tamil Nadu, India. *Int J Community Med Public Health* 2015; 2:526-30.
23. Acharya AS, Kaur R, Prasuna JG, Rasheed N. Making pregnancy safer birth preparedness and complication readiness study among antenatal women attendees of a primary health center, Delhi. *Indian J Community Med* 2015; 40:127-34.
24. Gopalakrishnan S, Eashwar VM, Muthulakshmi M. Health-seeking behaviour among antenatal and postnatal rural women in Kancheepuram District of Tamil Nadu: A cross-sectional Study. *J Family Med Prim Care* 2019; 8:1035-42.
25. Dave VR, Rana BM, Khanpara HJ, Sonaliya KN, Tolani J. Assessment of the birth preparedness and complication readiness among antenatal women at Ahmadabad city, India. *Ann Trop Med Public Health* 2017; 10:1278-85.
26. Akshaya KM, Shivalli S. Birth preparedness and complication readiness among the women beneficiaries of selected rural primary health centers of Dakshina Kannada district, Karnataka, India. *PLoS One* 2017; 12:e0183739.
27. Ghosh A, Dasgupta A, Paul B, Bandyopadhyay L, Sembiah S, Mallik N. Status of birth preparedness and complication readiness among recently delivered women: A community based study in a slum of Kolkata, West Bengal. *Int J Community Med Public Health* 2017; 4:3256-60.
28. Agarwal S, Sethi V, Srivastava K, Jha PK, Baqui AH. Birth preparedness and complication readiness among slum women in Indore city, India. *J Health Popul Nutr* 2010; 28:383-91.
29. Jain A, Singh S, Choudhary A, Jain A, Choudhary A. Maternal health-care seeking behavior in North India. *J Family Med Prim Care* 2017; 6:265-9
30. Abdulrida HN, Hassan RJ, Sabri MM. Knowledge and health-seeking practices of mothers attending primary health-care centers in Baghdad Al-Karkh sector about danger signs in newborns. *Mustansiriyah Med J* 2018; 17:29-35.
31. Vincent A, Keerthana K, Dhamotharan K, Newtonraj A, Bazroy J, Manikandan M. Health care seeking behaviour of women during pregnancy in rural south India: A qualitative study. *Int J Community Med Public Health* 2017; 4:3636-9.
32. Jha RK, Gopalakrishnan S, Ajitha K, Kuberan D, Rana MM. Utilization of maternal health care services in Kancheepuram District, Tamil Nadu. *Indian J Matern Child Health* 2010; 12:1-7.
33. Kotecha P, Patel S, Shah S, Katara P, Madan G. Health seeking behavior and utilization of health services by pregnant mothers in Vadodara slums. *Healthline* 2012; 3:30-5.
34. International Institute for Population Sciences India, "National Family Health Survey (NFHS-3 2005-06)," 2007, <https://dhsprogram.com/pubs/pdf/FRIND3/FRIND3-Vol1%5B0ct-172008%5D.pdf>.
35. Qureshi RN, Sheikh S, Khowaja AR, Hoodbhoy Z, Zaidi S, Sawchuck D, et al. Health care seeking behaviours in pregnancy in rural Sindh, Pakistan: A qualitative study. *Reprod Health* 2016; 13:76-81.
36. Mpembeni RNM, Killewo JZ, Leshabari MT et al., "Use pattern of maternal health services and determinants of skilled care during delivery in Southern Tanzania: implications for achievement of MDG-5 targets," *BMC Pregnancy and Childbirth*, vol. 7, article 29, 2007.
37. Awasthi MS, Awasthi KR, Thapa HS et. al. Utilization of Antenatal Care Services in Dalit Communities in Gorkha, Nepal: A Cross-Sectional Study. *Hindawi Journal of Pregnancy.* Volume 2018. Available on <https://www.hindawi.com/journals/jp/2018/3467308/>. [Last access on 28th Aug 2023]
38. K. Allendorf, "The quality of family relationships and use of maternal health-care services in India," *Studies in Family Planning*, vol. 41, no. 4, pp. 263-276, 2010
39. Chattopadhyay A. Men in maternal care: Evidence from India. *J Biosoc Sci* 2012; 44:129-53. *India. J Biosoc Sci* 2012; 44:129-53.
40. Saha R, Sarkar AP, Saha I, Misra R, Dasgupta S, Chatterjee S. The status of birth preparedness and complication readiness among rural Indian mothers. *IJPHR* 2014; 4:510-18.
41. Centers for Disease Control and Prevention. Reproductive Health. Weight gain during pregnancy. 2018. Available from: <https://www.cdc.gov/reproductivehealth/maternal-infant-health/pregnancy-weight-gain.htm>. [Last cited on 12 Aug 2023]
42. Yeo S, Crandell JL, Jones-Vessey K. Adequacy of prenatal care and gestational weight gain. *J Womens Health (Larchmt)* 2016; 25:117-23.
43. Deepanrajan R, Rahman A, Aparajitha D. Breastfeeding knowledge among antenatal mothers: A cross-sectional study in a rural area of West Bengal. *IOSR-JDMS* 2015; 14:93-97.
44. Kamineni V, Murki AD, Kota VL. Birth preparedness and complication readiness in pregnant women attending urban tertiary care hospital. *J Family Med Prim Care* 2017; 6:297-300.