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Antenatal Care Services Utilization in Rural Jammu and Kashmir: An Empirical Study from the Northwestern Himalayan State of India

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Abstract: This study aims to examine the utilization of antenatal care services and the role of topography in determining the antenatal care seeking behavior of pregnant women in rural Jammu and Kashmir. The study uses a mixed-methods approach, with both quantitative and qualitative data collected through structured questionnaires, in-depth interviews, and field observations. A total of 400 women who gave live births in the preceding year were interviewed, with 200 women each from the plain and mountainous areas. The results indicate that only 47.5% of women received their first antenatal care check-up during the first trimester of pregnancy, while 69.5% received at least three visits. Furthermore, only one-fourth of women consumed iron-folic acid tablets for the recommended ninety days, and a mere 14% received full antenatal care in the mountainous region. The study identifies distance and time to reach a health facility as the major determinants of antenatal care utilization. Women living in the mountainous regions who are far from health centers, belong to the younger age group, have a higher birth order, got married at a young age, are illiterate, belong to a scheduled tribe, have no media exposure, and are below the poverty line, face more significant barriers in accessing antenatal care services. The study concludes that the coverage of antenatal care services is considerably lower in mountainous areas than in plain rural areas of Jammu and Kashmir, which highlights the need to improve the accessibility of antenatal care services in remote areas.

Keywords: Antenatal Care Visits, IFA tablets, Jammu and Kashmir, Mountain area, Plain area.

Introduction

Under Sustainable Development Goals (SDGs), the global community has set a goal to reduce the women deaths due to pregnancy-related causes to below seventy per thousand live births by 2030. In spite of a drop of 45 per cent in maternal mortality ratio since 1990, still, there is a noteworthy local imbalance exist. Sub-Saharan Africa and South Asia are the two major contributors to maternal deaths due to preventable pregnancy-related causes, i.e. 62 per cent and 24 per cent, respectively (Goli, Rammohan, & Moradhvaj, 2018). One-third of the maternal deaths in the world occur in two countries, i.e. India is the largest contributor with 17 per cent, and Nigeria contributes 14 per cent to the global maternal mortality (Goli, Rammohan, & Moradhvaj, 2018; WHO, 2019).

India is the largest contributor to maternal deaths, and the latest estimates have shown that there are 113 women dies per 100000 live births in the country (SRS, 2016-18). The Government of India collects data on maternal deaths through the Sample Registration System (SRS). Assam records the highest Maternal Mortality Rate (MMR), i.e. 215 maternal deaths per one lakh live births, followed by Uttar Pradesh/Uttarakhand, Rajasthan, Odisha, Madhya Pradesh and Bihar/Jharkhand. The subtotal of

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Empowered Action Group (EAG) states and Assam records 161 deaths per one lakh live births (SRS, 2016-18).

Most of the maternal deaths happening in developing countries are preventable. To ensure a safe pregnancy, women should have to go through several antenatal check-ups to ensure the proper growth of foetus and diagnostic of any maternal complications which can be lethal to the existence of women and her baby (GOI, 2010). Very low utilisation of maternal health care (MHC) services in the developing countries like India is the major reason for a large number of maternal deaths, and the threat of obstetric morbidity is even greater (Chauhan, Sivanandan, Singh, & Ojha, 2021). The latest estimates of the National Family Health Survey (NFHS) have found that one out of five women who have delivered their baby five-year preceding survey received full antenatal care (ANC) in India (International Institute for Population Sciences (IIPS) and ICF, 2021). However, there is a huge regional and local level variation in antenatal care services utilisation in the country.

Jammu and Kashmir is one of the eighteen high focused states under National Rural Health Mission (NRHM) in the country (Ministry of Health and Family Welfare, 2012). Although the coverage of antenatal care services in Jammu and Kashmir is better than national level, but still just 26.8 percent of women who delivered their last live birth preceding five years of survey received full antenatal care4 (International Institute for Population Sciences (IIPS) and ICF, 2021).

There is no estimates of MMR for Jammu and Kashmir available in the existing secondary sources of datasets (SRS, 2022). However, the data on ANC services utilisation and prevalence of maternal morbidity has been collected through several national-level surveys from time to time. The coverage of ANC services in Jammu and Kashmir is better than at the national level, though the state lags behind several states and union territories and it is one of the eighteen high focused states (International Institute for Population Sciences (IIPS) and ICF, 2021). The state contains more than seventy per cent of the rural population living in the villages where the main source of health care services are the public health centres. The availability of health infrastructure in plain and high population density area is generally better than hilly and mountainous and sparsely populated area (Muniswamy, Krishna, & Kumar, 2021).

During the last decade, several initiatives have been undertaken to enhance the accessibility and coverage of ANC services, for instance, Janani Suraksha Yojana (JSY), Janani Shishu Suraksha Karyakaram (JSSK) and the introduction of Accredited Social Health Activist (ASHA) worker under NRHM (Gupta, et al., 2018). These schemes have brought down maternal deaths substantially and enhanced the coverage of antenatal care services extensively in rural area. But the results of these interventions are not equally distributed, and there are still a large number of women don't receive essential services such as Antenatal care especially the most vulnerable women belong to socially,

[4] *Full Antenatal Care Includes having received four ANC visits, at least one TT injection and having taken IFA tablets or syrup for 100 or more days.*

economically weaker section of the society and in the hard to reach rural mountain area (Mustafa & Shekhar, 2021).

Several studies have found that rural women are less likely to receive antenatal care services compared to their counterparts those live in the urban area (Addai, 2000; Wondimu, Girma, & Agedew, 2017; Silal, Kekana, Harris, Birch, & Mclntyre, 2012; Hazarika, 2011). But very limited studies have been conducted to examine the existing gap in antenatal care services utilisation within the rural area. Inside rural areas, there is a substantial inconsistency between plain and mountain setting and women living in the mountain area confront with multiple obstacles to get care during the pregnancy, for instance, physical barriers to reach a health facility, socio-cultural and economic barriers (Mohammad, 2005; Pacagnella, Cecatti, Osis, & Souja, 2012; Lalmalsawmzauva & Nayak, 2006). Frequently mountain areas are politically marginalised and economically distressed. The governments invest less and less in the development of mountain communities. Remoteness is not the only factor leading to poor access to services, individual behaviour and political priorities over the use of services are also relevant (Audsley, Wallace, & Price, 2016). Although the delivery of services is difficult in the mountain areas, it is not impossible (Chin & Dye, 2016).

Jammu and Kashmir attribute rugged terrain, poor transportation and communication meant that reach to the health facility is often difficult, especially in the rural and mountainous areas of the state. Paucity or absence of road networks caused transport to be an important barrier to reach a health facility. In some areas of the state travel times have to be measured in hours or even days rather than minutes because of the geography of the state (and in maximum cases, people travel without transportation on foot), these become major deterrents to antenatal care services utilisation (Baral, Lyons, Skinner, & Van, 2010).

This paper will particularly discuss the antenatal care services utilisation in the mountain and plain geographical settings within rural areas of Jammu and Kashmir. Despite the significant increase in antenatal care services utilisation rural-urban divide has been continuously persisting (Elo, 1992; Mekonnen & Mekonnen, 2002; Tewodros, Mariam, & Dibaba, 2009).

Data and Methods

Sample Selection

Foremost, the state of Jammu and Kashmir (J&K) was selected for this study. The composite index was developed from a list of variables of maternal health care services utilization for the states and union territories of India. The variables were used for computing of composite index through Principal Component Analysis (PCA) are 1. Four or more than four ANC visits 2. At least two TT injections 3. IFA tablets for at least 100 days. 4. Full ANC 5. Institutional delivery 6. Safe Delivery and 7. Postnatal check-up after delivery. It was found that the Jammu and Kashmir ranked sixteenth among the thirty-six states and union territories. Subsequently, in the similar manner, a composite index was

computed at the district level in J&K. The district kathua was selected based on the performance of maternal health care service utilisation, Kathua was one of the better performing districts in Jammu and Kashmir. Thus to identify barriers and facilitators of good coverage of ANC in J&K, two tehsils, i.e., Bani (Mountainous and 100 per cent rural) and Kathua (Plain and most urbanised) were selected for conducting comparative study of determinants of ANC coverage in the mountain and the plain within the rural area of the Kathua district. Two blocks each from tehsil Bani (Block Bani & Duggan) and Kathua (Block Kathua & Barnoti) were selected one each from near and away from the tehsil headquarters. Total 400 women were surveyed during the field survey 200 each from tehsil Kathua and Bani by the researcher itself. Which comprised 100 each from four blocks i.e. block Kathua and Barnoti (Plain) and block Bani and Duggan (mountainous).

Data Collection

The field survey was conducted between March 2017 and July 2017. The target group of the population was ever-married women who had delivered a baby one year preceding the survey. The rationale behind conducting interviews of only those mothers who had given birth one-year preceding survey was to get the maximum possible information with minimal recall lapses. Data was collected through a structured questionnaire, which incorporated the information on the respondent's household socio-cultural, and economic aspects. The next section dealt with physical accessibility, which includes questions on distance and time taken to reach to health centres and the Motorable road from respondents home. The third section contained information about the utilisation of antenatal care services. Apart from the direct questions through a structured questionnaire, target respondents and other community members who play an important role in women antenatal care seeking behaviour were interviewed during the field survey. The primary data thus obtained from field form has been analysed for duplicity, incompleteness, non-response, and data inconsistencies. After removing the data errors, primary data collected has been analyzed by using the Statistical Package for the Social Sciences (SPSS) statistical software. Microsoft office was also used to make graphs and tables.

Dependent Variable

Full antenatal care has been taken as a dependent variable in binary logistic regression analysis, a composite variable has been computed which includes at least three antenatal check-ups, one tetanus injection (TT), and the consumption of iron and folic acid (IFA) tablets for more than ninety days**.**

Independent Variables

During the primary field survey, the questions on women's socio-cultural, economic and physical accessibility has been asked. To measure the physical accessibility the variables included are (1) distance to health centre, 2. Time taken to reach health centre, 3. Distance to motorable road, 4.

Time taken to reach motorable road and 5. Type of road. To assess the association between women socio-cultural accessibility and the utilization of full antenatal care services the following variables have been taken, 1. Age of respondent, 2. Age at marriage, 3. Birth order, 4. Place of residence, 5. Education of Respondent, 6. Religion, 7. Ethnicity and 8. Exposure to mass media. For the household economic background of women, the question was asked whether the household comes under Below Poverty Line (BPL) or Above Poverty Line (APL).

Statistical Analysis

Binary Logistic regression model is applied under cases where response variable is categorical, and it is used to measure the relationship between categorical response variable and one or more continuous, discrete or categorical explanatory variables (Retheford & Choe, 1993). In this study, Binary logistic regression has been used to show the influence of women's socio-economic and demographic background characteristics on their antenatal care seeking behaviour among the selected sample of the woman. In this study, women's socio-economic and other demographic background characteristics have considered as independent variables. The full antenatal care, which is dependent variable has been converted into the dichotomous variables (if woman received full antenatal care = 1 and otherwise = 0). In all independent variables, the first category of variables has been taken as the reference category. The model specification is given as (Retherford & Choe, 1993),

$$\boldsymbol{Y = log\left(\frac{p_i}{1-p_i}\right) = \alpha + \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_K X_K + \varepsilon_i}$$

For this study, Y is dichotomous response variable, which is related to k independent variables X1, X2 ……Xk, $\boldsymbol{\beta_i}$'s are the regression coefficients and ε_i is the identical independent standard normally distributed with mean zero and unit variance.

Results

Antenatal Care Services Utilization

Antenatal care, otherwise called pre-birth care, is the efficient supervision of pregnant ladies to screen the advancement of her foetal development and to guarantee the prosperity of the mother and the baby (GOI, 2010). A total antenatal registration gives fundamental consideration to the pregnant women and aides in recognising pregnancy complications, for example, pre-eclampsia, iron deficiency and hypertension and so on in the mother and deficient/moderate development of the foetus (GOI, 2010). Some fundamental parts for quality ANC establish early following and enlistment of pregnancy inside the first trimester, find out four ANC visits including a visit for registration, given two doses of Tetanus (TT) injections and at any rate 100 tablets of iron and folic acid.

Table 1 examines the percentage of women who had received various antenatal components during their last live birth in tehsil Bani and Kathua preceding one year of the primary survey. Almost universal registration of pregnancy has been recorded in the study area, i.e. 97.2 per cent. However, the marginal difference in registration could be noted from the table between tehsil Bani and Kathua.

Moreover, early registration ascertains early entry of women into the health system, and it helps in the detection of any possible obstetric complication. At the time of registration, pregnant women should provide MCP care. Mother and Child Protection card has been developed as a tool for women families to understand, learn and follow practices for achieving good health of pregnant women. MCP helps pregnant women to know about various types of services which they need to access the health and wellbeing of themselves and her children. MCP card is very important to keep a health record of pregnant women and their children. In the current study, most of the respondents have got the MCP card. The percentage of women who received at least one antenatal check-up was also recorded very high in the study area.

Table 1: Percentage of Various Components of Antenatal Care Services

Antenatal Care Components		**Bani** (N=200)	**Kathua** (N=200)	**Total** (N=400)
Received MCP Card	Frequency	191	196	387
	Percentage	95.5	98	96.8
Received Any ANC Check-up	Frequency	193	198	391
	Percentage	96.5	99	97.8
ANC Received in the First Trimester	Frequency	95	140	235
	Percentage	47.5	70	58.8
Received Three and Above ANC Visit	Frequency	139	194	333
	Percentage	69.5	97	83.4
90+ IFA Tablets	Frequency	51	101	152
	Percentage	25.5	50.5	38
Two or More TT Injection	Frequency	141	175	316
	Percentage	70.5	87.5	79
Full Antenatal Care[1]	Frequency	28	77	105
	Percentage	14	38.5	26.2

Source: Primary field Survey, 2017.
Note: [1]Full ANC includes atleast 3 ANC visit, one TT injection and IFA tablets for more than 90 days.

The first visit at the time of registration of pregnancy for ANC should take place as soon as the pregnancy is suspected. Ideally, the first visit should be within three months of conception. But if women are not able to come within the first trimester of pregnancy and come later, they should be register and proper care and counselling should be provided to them and their family member according to the gestational age. More than forty percent of women did not visit to their health provider within the first trimester of their pregnancy in the study area. The percentage of respondents having ANC visit within the first trimester of pregnancy during their last live birth one-year preceding primary field survey varies from 47.5 per cent and 70 percent in tehsil Bani (mountain) and Kathua (plain) respectively (Table 1).

Next component in the line comes to some ANC visits for pregnant women. According to the government norms, pregnant women should have visit to health provider every month till the delivery. But practically it is not possible for women in developing countries like India to visit health facility every month. Therefore, the Government of India (GOI) recommend at least four ANC visits, including the first visit of pregnancy registration. In the present study, three ANC visits are considered for analysis, including the first visit in the first trimester of pregnancy for registration. Considering the very low level of maternal health care services utilisation among the mountain women and their busy daily schedule, it is hard to them get ANC visits frequently. Therefore, three ANC visits one each for three trimesters of pregnancy have been considered for analysis. More than eighty per cent of the respondents have received at least three ANC visits during their last live birth in the study area, and it varies according to the geographical setting of women from where she belongs. In the mountain area (Bani) more than thirty percent of respondents did not take at least three ANC visits during their last live birth. On the other hand, in the plain area (Kathua) almost universal coverage of at least three ANC visits was recorded (Table 1).

As part of antenatal care, all women in the reproductive age group should have to consume at least 100 IFA tablets/syrup. IFA tablets and syrup helps to reduce the incidence of neural tube defects in the foetus. During the field survey, eligible women were asked about the consumption of IFA tablets/syrup for at least 90 days or three months.

Table 1 depicts that only 38.2 per cent of respondents take IFA tablets for at least three months in the study area. The percentage of respondents who consumed IFA tablets/syrup for at least three months during their last live birth one-year preceding field survey is two times higher in tehsil Kathua compared to tehsil Bani, i.e., 50.5 per cent and 25.8 per cent respectively (Table 1).

Two tetanus injections for pregnant women are recommended to prevent the expected mothers and their new-born from tetanus. The first injection should be given as soon as possible, preferably at the time of pregnancy registration by antenatal care provider, the second injection is to be given one month after the first, preferably at least one month before the expected date of delivery (GOI, 2010).

Table 1 demonstrates that 79 percent of respondents have received two doses of TT injection in the study area. In the mountain region, the coverage is 70 percent, and in the plain, it is 87.2 percent. In most of the cases who did not receive two TT injections have cited second delivery within three years a reason and have received one TT injection.

For the micro-level analysis, Full ANC comprises at least three ANC visits, one TT injection and consumption of at least 90 IFA tablets/syrup. Few more than one-fourth of the total respondents have received full ANC in the study area. The coverage of full ANC records is almost three times higher in the tehsil Kathua, i.e., 38.5 per cent compared to tehsil Bani, where it is just 14 per cent (Table 1).

Reasons for Not Consuming IFA Tablets/Syrup

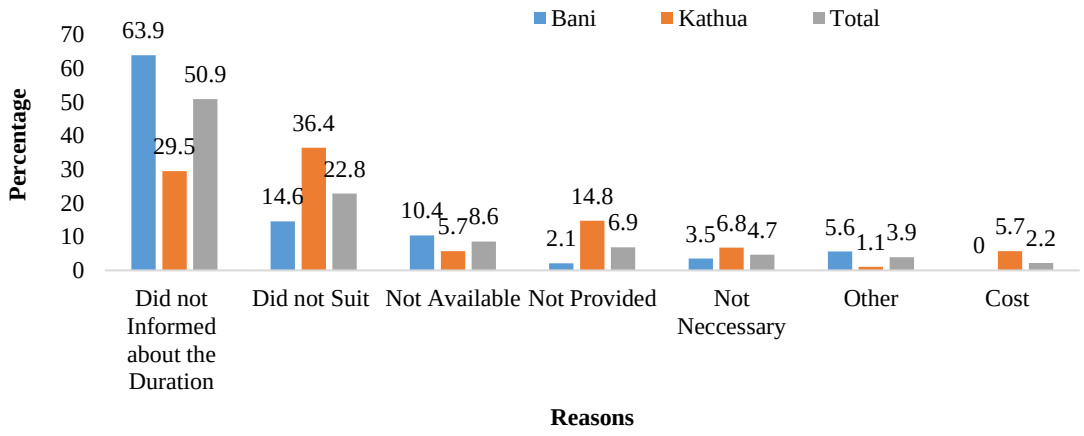
During the field survey question on the reasons for not consuming the recommended number of IFA tablets/syrup was asked by the researcher. Lack of information about the duration and number of days and tablets required to consume has been cited as the major reason for the low consumption of IFA tablets/syrup (Figure 1). One-fifth of respondents said that tablets do not suit them. In the tehsil, Bani, seventy per cent of women said they did not know the duration and number of days IFA tablets/syrup should be consumed.

On the other hand, in the tehsil Kathua, the major reason for not consuming required IFA tablets is not suited to their health. Women gave different sort of reasons for not consuming IFA tablets; for instance, one of the respondents said that:

"My neighbour told me that you should not take IFA tablets; it is not good for your baby. It will cause swelling to baby". Another one I was afraid, I will become fat after consuming IFA tablets."

(The Respondents from Kathua)

Figure 1: Reasons for not Consuming Required IFA Tablets/Syrup



Source: Primary Field Survey, 2017.

Services Provided During Antenatal Care Visits

It is recommended to health provider at a health facility that before beginning each ANC check-up, ensure that all the required instruments and equipments are available and in working conditions. These includes "a weighing scale, inch tape, stethoscope, blood pressure apparatus, foetoscope, thermometer, MCP card and register, watch, gloves, 0.5 per cent chlorine solution, syringes and needles, hub cutter, spirit swabs, IFA tablets, TT injections and equipment's for testing hemoglobin and urine (GOI, 2010).

Table 2 explains the percentage of women who received various ANC services during their visits to the health centre. During the field survey, eligible women were asked whether they had received various services as the measurement of weight and height, blood test, urine test, abdomen checked, breast examined, ultrasound, delivery date, and delivery advice or not. One can observe from the table that the percentage of women who have availed various antenatal services is lower in tehsil Bani compared to the tehsil Kathua.

Table 2: Percentage of Women Received Antenatal Care Services during their Antenatal Visits

Component		**Bani** (N=193)	**Kathua** (N=198)	**Total** (N=391)
Weight Measured	Frequency	130	184	314
	Percentage	67.4	92.9	80.3
Blood Test	Frequency	189	196	385
	Percentage	97.9	99	98.5
Height Measured	Frequency	117	177	294
	Percentage	60.6	89.4	75.2
Urine Test	Frequency	188	196	384
	Percentage	97.4	99	98.2
Abdomen Check	Frequency	188	196	384
	Percentage	97.4	99	98.2
Breast Checked	Frequency	187	197	384
	Percentage	96.9	99.5	98.2
Ultrasound	Frequency	186	197	383
	Percentage	96.4	99.5	98
Delivery Date	Frequency	163	193	356
	Percentage	84.5	97.5	91
Delivery Advice	Frequency	136	188	324
	Percentage	70.5	94.9	82.9

Source: Primary Field Survey, 2017.

Counselling During Antenatal Care Visits

Counselling of pregnant women on various issues at the time of ANC visits play an important role in the wellbeing of mother and her new-born baby. It is recommended to the health provider that he/she have to counsel the pregnant women related to their pregnancy. Unawareness related to various services required for the smooth progression of pregnancy is the major reason for low utilisation of maternal healthcare services. During our field visit; it was asked to the respondents whether she was counselled at the time of the ANC visits or not. More than ninety per cent of the respondents said that health provider had counselled them during their last live birth. The percentage of respondents who got any sort of counselling during their last live birth is ten percentage point high in tehsil Kathua compared to the tehsil Bani. The percentage of women who received information related to TT injections is 84 per cent and 94.5 per cent in tehsil Bani and Kathua, respectively (Table 3).

Breastfeeding is one of the most important functions immediately after birth; it helps new-born and mothers in many ways for their health and wellbeing (GOI, 2010). A woman should be encouraged for exclusive breastfeeding for six months. During the field survey, women were asked whether they were advised for immediate breastfeeding or not. Percentage of women who stated that they

had been advised for breastfeeding is 84 in total, and it varies between 72.5 and 95.5 percent in tehsil Bani and Kathua, respectively (Table 3).

It is expected from the health provider that they will encourage every pregnant woman who comes for ANC visits to have institutional delivery. Explain to women the importance of institutional delivery as complications can develop at any time during pregnancy, delivery and postnatal. These complications are not always predictable, and if skilled professionals do not treat them at the institution, they can cost the life of the mother or baby or both.

Table 3: Percentage of Women Received Information during their Last Live Birth

Counselling	Bani (N=200)	Kathua (N=200)	Total (N=400)
Counselling	88.5	98	93.2
TT Injection	84	94.5	89.2
Immediate breastfeeding	72.5	95.5	84
Institutional Delivery	65	95	80
New-born Care	40.5	69	54.8
Immediate baby dry	24	72.5	48.2
Cleanliness	21	72	46.5
Use of CHDK	27.5	60.5	44
Arranging Blood	8	56	32
Danger Sign	20	40.5	30.2
Emergency Transport	10	47	28.5
Financial preparation	6	15.5	10.8
Family Planning	12.5	8.5	10.5

Source: Primary Field Survey, 2017.

One-fifth of women stated that they were not encouraged by health providers for institutional delivery and risk of delivery at home. In the tehsil Kathua, most of the women have replied they had counselled for institutional delivery, but in the case of Bani, more than one third said they had not encouraged for institutional delivery (Table 3).

Around half of the respondents replied they had received counselling on newborn care and immediate baby dry in the study area. The percentage of respondents who have gotten counselling on these two components are higher in tehsil Kathua compared to the Bani where a very low percentage of women received counselling related to newborn care and immediate baby dry (Table 3).

Only one-fifth of women in tehsil Bani received counselling on cleanliness, which is three and half times lesser than the tehsil Kathua, where 72.5 per cent of respondents have got counselling related to cleanliness (Table 3). The percentage of women who have received counselling on the use of Clean Disposable Delivery Kit (CDDK) is 27.5 per cent and 60.5 per cent in tehsil Bani and Kathua, respectively (Table 3).

Although women are entitled to free provision of blood under Janani Shishu Suraksha Karyakaram (JSSK), health provider must motivate women and their relatives to donate blood for replacements. Here also one-third of women were counselled by health provider for the arrangement of

blood during ANC visits and the figure is as low as just 8 per cent for tehsil Bani and 56 per cent in Kathua which is seven times higher than Bani (Table 3).

The pregnant woman and her caretakers should be informed about the potential danger signs of childbirth. Very few percentages of women replied they had been counselled about danger signs of pregnancy in the study area, and it is 20 per cent in tehsil Bani and 40.5 per cent in tehsil Kathua (Table 3).

Women and her family should be counsel for identifying transportation facilities in emergency case because in rural areas where road connectivity is not up to mark reaching health facilities (second delay) is the major cause of maternal deaths. Under JSSK, women are entitled to get a transportation facility at the time of delivery from home to health facility and between health facilities in case of referral. Despite, the Government provisions, and instructions to the health provider less than one-third of women have been informed for emergency transportation arrangements in the study area and just ten percent were in the case of Bani which is lacking in road infrastructure and geographically hard to reach. On the other hand, in Kathua, 47 per cent of women said they had been informed about the benefits under JSSK and the availability of transportation facilities (Table 3).

Women and her family should be advised to keep an emergency fund or have a source of money for emergency funding in case of emergency. It is expected from the health provider that he/she will inform pregnant women about various schemes that are available for providing funds for maternal health or assisting with transportation facilities, for instance, JSY and JSSK (GOI, 2010). Around ten percent of women said they had been counselled for financial preparation in the study area, and the percentage is higher among women from the plain area than those who belongs to the mountain area (Table 3).

Very few percentages of women in the study area got a piece of advice on family planning. However, the percentage of women is higher in tehsil Bani who got counselling on family planning compared to the Kathua (Table 3).

Information about Signs of Obstetric Complications

Table 4 shows the percentage of women who received information about pregnancy complications during their antenatal visits from health care providers. It is expected from the health provider that women should be informed about the potential danger signs during pregnancy, delivery and in the post-partum period (GOI, 2010). Women must be informed about the complication sign during pregnancy and mitigation measures such as, visit to nearby health facility and consulting doctor without any delay. Nearly one-fourth of the respondents reported that they had been informed about the signs of pregnancy complications during their last live birth in the study area (Table 4).

Table 4: Percentage of Women who Received Information about the Various signs of Pregnancy complications

Advice about Sign of Complications		**Bani** (N=200)	**Kathua** (N=200)	**Total** (N=400)
Pregnancy Complication	Frequency	41	65	106
	Percentage	20.5	32.5	26.5
About Bleeding	Frequency	40	64	104
	Percentage	20	32	26
Convulsion	Frequency	39	62	101
	Percentage	19.5	31	25.2
Prolonged Labour	Frequency	40	63	103
	Percentage	20	31.5	25.8
Abdominal Pain	Frequency	39	64	103
	Percentage	19.5	32	25.8
High Blood Pressure	Frequency	40	64	104
	Percentage	20	32	26

Source: Primary Field Survey, 2017.

Conspicuously, the percentage of women received information about signs of pregnancy complication was 20.5 per cent and 32.5 per cent in the tehsil Bani and Kathua, respectively. The table presents similar results for the percentage of women who received information about the different signs of pregnancy complications. The general trend shows that just one-fourth of women in the study area have been informed about the signs of pregnancy complications and the percentage is lower in the tehsil Bani compared to the tehsil Kathua (Table 4).

People Who Accompanied Women for ANC Visits

Under NRHM, while keeping in mind to enhance the access and utilisation of antenatal care services, the Government of India has introduced a new brand of community-based functionaries named ASHA workers. ASHA supposed to be the first port of call for any health-related demands of pregnant women who find it difficult to access health services.

Table 5: Percentage of Women who were accompanied by Different People to a Health Facility for ANC visits.

People who accompanied for ANC visits		**Bani (N=193)**	**Kathua (N=198)**	**Total (N=391)**
ASHA	Frequency	22	98	120
	Percentage	11.4	49.5	30.7
Husband	Frequency	121	57	178
	Percentage	62.7	28.8	45.5
Other Family Member	Frequency	38	36	74
	Percentage	19.7	18.2	18.9
Went Alone	Frequency	12	7	19
	Percentage	6.2	3.5	4.9

Source: Primary Field Survey, 2017.

Table 5 examine, the percentage of women who were accompanied by different people to a health facility for ANC visits during their last live birth preceding one year of primary field survey in tehsil Bani and Kathua. Accompany pregnant women for an antenatal visit to a health facility is one of

the major duty of ASHA workers. However, in the study area, more than two-thirds of women said ASHA did not escort them for an antenatal care visit during their last live birth.

One can observe the huge gap of a percentage point between Kathua and Bani, in tehsil Kathua, around fifty percent of women were escorted by the ASHA workers for antenatal care visits. On the other hand, just one-ninth of women in the mountain area was escorted by ASHA workers for antenatal care visits. The person who generally accompanies women for antenatal care visits in the mountain is the husband of the respondents 62.7 per cent and 28.8 per cent in the plain area (Table 5).

Determinants of Full Antenatal Care Services Utilisation in the Study Area

Table 6 presents the results of binary logistic regression through the odds ratio for full antenatal care. The binary logistic regression results show that distance and time taken to reach health centres are insignificant factors in the study area, although women living away from the health centres are less likely received full antenatal care compared to those who live near to the health centre (Table 6) (Gage & Calixte, 2007; Ram & Singh, 2005). Type of road to the health centre is a significant predictor of full antenatal care services utilisation in the study area and women having not asphalt road connectivity between home and health centres are less likely received full antenatal care compared to those who have asphalt road connectivity in the study area (Table 6) (Matsuoka, Aiga, Rasmey, Rathavy, & Okitsu, 2010).

Table 6 further explain the results of binary logistic regression for women socio-cultural and economic factors in the study area through the second model. The model shows that the age of mothers, place of residence, and education of women and ethnicity of women are the significant determinants of full antenatal care services utilisation in the study area (Ibnouf, Borne, & Maarse, 2007). The age of respondents show a positive association with seeking full antenatal care and older women are more likely received full antenatal care compared to their younger counterpart and results are significant for women of ≥ 29 years of age in the study area (Table 6) (Singh, Rai, Alagarajan, & Singh, 2012). Age at marriage and birth order of women have not a significant factor for seeking antenatal care in the study area.

Women belong to higher birth order, Muslim religious group, no media exposure and BPL household are less likely received full ANC compared to those who belong to low birth order, Hindu religious group, any media exposure and APL household in the study area, and results are insignificant (Chakrabarti & Chaudhuri, 2009; Singh, Rai, Alagarajan, & Singh, 2012).

Table 6: Odds Ratio from Binary Logistic Regression Analysis Predicting Likelihood of Full Antenatal Care Utilisation in the Study Area.

Covariates	Frequency (N = 400)	Full ANC (%)	Model I	Model II
Distance to Health Centre				
≤1Km *Ref.*	213	32.9		
> 1 Km	187	18.7	0.827	
Time to Health Centre				
≤ 30 Minute *Ref.*	353	28		
>30 Minute	47	12.8	0.781	
Distance to Motorable Road				
≤1 Km *Ref.*	246	33.3		
>1 Km	154	14.9	0.659	
Time Taken to Motorable Road				
≤ 30 Minute *Ref.*	292	29.8		
> 30 Minute	108	16.7	1.801	
Type of Road				
Asphalt *Ref.*	191	38		
Other	209	14.8	.307**	
Age of Respondent				
≤ 24 Years *Ref.*	145	20.7		
25-28 Years	165	25.5		1.248
≥ 29	90	36.7		2.058*
Age at Marriage				
≤ 18 Years *Ref.*	136	18.4		
≥ 19 Years	264	30.3		0.784
Birth Order				
1 *Ref.*	141	32.6		
2	149	25.5		0.608
≥ 3	110	19.1		0.77
Place of Residence				
Bani *Ref.*	200	14		
Kathua	200	38.5		2.829***
Education of Respondent				
Illiterate Ref.	108	11.1		
Middle	60	26.7		1.761
Secondary	181	28.2		2.039*
Higher	51	51		4.122***
Religion				
Hindu *Ref.*	359	26.7		
Muslim/Other	41	23.1		0.759
Ethnicity				
ST/SC *Ref.*	213	17.84		
Other	187	35.8		1.766**
Exposure to Mass Media				
No Exposure *Ref.*	149	14.8		
Any Exposure	251	33.1		1.009
Household Economic Status				
APL *Ref.*	187	33.7		
BPL	213	19.7		0.801
Constant		26.2	0.664	

Source: Computed from Primary Field Survey.
Significant level: *** =P<0.01, **=P<0.05, and *=P<0.10.

Discussion

In this study we found that only 26.2 percent of the respondents have received full antenatal care and this coverage is varying across the women's socio-cultural, economic and place of residence as a background characteristics within rural areas (Chakrabarti & Chaudhuri, 2009; Gage & Calixte, 2007). Although, the coverage of full antenatal care services is slightly

better in geographically plain areas (tehsil Kathua), in the mountain area just 14 percent of the respondents received full antenatal care. This low coverage in the mountain is attributed to the poor socio-economic household background of women which determine their choices to seek antenatal care services (Wondimu, Girma, & Agedew, 2017). As the literature suggested that the women of young age group, high birth order, low education level, belongs to marginal section of the society, less media exposure and low household income are less likely received antenatal care services as compared to their counterpart (Ibnouf, Borne, & Maarse, 2007; Pacagnella, Cecatti, Osis, & Souja, 2012). The proportion of the population to the total population belonging to these groups is significantly higher in the mountain area as compared to the plain area of the state. The age of women and the full antenatal care are positively associated and the women of old age group are more likely received antenatal care services as compared to the young age group (Shah, Baral, Basnyat, & Shreshta, 2020). In the present study we found that the place of residence is a significant predictor of seeking full antenatal care and the women of plain area (tehsil Kathua) are three times more likely received full antenatal care as compared to those residing in the mountain area (tehsil Bani) (Mustafa & Shekhar, 2021; Wondimu, Girma, & Agedew, 2017). The education level of women and the utilization of full antenatal care are also positively associated and the women having higher education more than four times more likely received full antenatal care services compared to the illiterate women and the results are consistent with other studies (Elo, 1992). Women belongs to other than scheduled caste and schedule tribe ethnic groups are more likely received full antenatal care and the results are significant (Singh, Rai, Alagarajan, & Singh, 2012).

Those who overcome the socio-economic barriers to seek antenatal care have been facing the biggest challenge to reach the health facility. In the mountain area the health facilities are not evenly distributed apart from this poor road connectivity, and the shortage of human resources and other equipment at the health center are the significant determinants of seeking antenatal care services (Kumar, Parveen, & Tufail, 2021). In the present study it has been found that women residing away from the health centers are less likely received antenatal care services as compared to their counterpart and the results are not significant (Chakrabarti & Chaudhuri, 2009; Lalmalsawmzauva & Nayak, 2006). Distance to road and types of road to health center are also the significant determinants of full antenatal care. To get preventive antenatal care mountain women travel long distance which incurred a high opportunity cost in mountain settings compared to the plain settings within the rural area (Lalmalsawmzauva & Nayak, 2006).

Even the distance of a few kilometers in the mountainous area is enough to deter pregnant women from seeking antenatal care. Along with heavy investment in rural healthcare infrastructure, the government should take step to bring behavioral change through awareness camps to expected mothers.

Because in the mountain area women are more deprived from socio-cultural and economic capital, they don't go to the health center for preventive care like antenatal check-ups. For instance one of the respondent from tehsil Bani said that "we don't take medicine or go to the hospital until there is an emergency or any health problem." This reflects that women don't have proper information regarding preventive care and they don't believe in this. Apart from this social beliefs and customs also influence the antenatal care seeking behavior of women in mountain areas such as they believe in their deities and worship them to cure themselves from any sort of illness.

As it has been suggested in the literature that the maternal death is the consequence of three delays in seeking preventive and emergency maternity care (Gabrysch & Cambell, 2009) and (Thaddeus & Maine, 1994). Because in the mountain areas severity of three delays in seeking preventive and emergency care is greater compared to the plain rural areas. The current schemes to address the issues of accessibility and utilisation of antenatal care services do not produce much desired results in the mountain regions. For instance, the ASHA worker is responsible to identify and bring the pregnant women to the health centre, but in the mountain area only 11.4 percent of women were accompanied by the ASHA worker to antenatal care visit during their pregnancy (Paul & Pandey, 2020). On the other hand, in the rural plain region recorded much better penetration and success of existing programs and schemes. Due to the shortage of drugs and medicines and dysfunctioning of the equipment's most of the respondents sought tests and medicines from private medical shops and did ultrasound from private hospitals (Kumar, Parveen, & Tufail, 2021).

There should be sub-district level delimitation of high and low priority areas to address the problem at a more grassroots level because, within districts, there is a huge variation in the state. The criteria of the population of every thousand per ASHA worker should be different for the rural plains and mountainous regions. Because in the mountain area due to the low population density, no road infrastructure, and high average distance covered by the ASHA worker discourage them. Either the incentive provided to the ASHA worker should be enhanced in the mountain area, or the population norms for the mountain area should be changed. There is no lack of policy documents on the provisioning of antenatal health care services, but the proper implementation of all these programs and schemes will be a challenge for the government, especially in the mountainous regions.

Although the Government launched NRHM to provide free of cost maternal health care services women in the mountain area especially spend more to deliver in the hospital and opportunity cost is also high in the mountain because women have to travel with someone for long-distance they also pay for transportation and staying at the health facility (Goli, Rammohan, & Moradhvaj, 2018). Within rural areas of the state, mountain women are at the greater risk of maternal deaths and morbidity. The Himalayan region communities requires creative and efficient solutions that will engage women in healthcare system regardless of their socio-economic background characteristics (Prochaska, et al., 2016).

Conclusion

In Jammu and Kashmir in general and in the mountain regions in particular, the coverage of antenatal care services are still minimal during pregnancy. Especially, in the mountain region along with geographical alienation the socio-cultural and economic background characteristics of women are playing significant role in low antenatal care services coverage. This situation leads to the lack of information to women and their families regarding the importance of regular antenatal check-ups as a preventive care. During the in-depth interviews with the respondents, researcher came to know that the lack of information regarding the required number and timing of ANC visits, consumption of IFA tablets and TT injections during the pregnancy is the major cause for low ANC coverage. All these factors also hinder the penetration of the Government schemes in the mountain region, for instance, just 11.6 percent of the respondents were accompanied by ASHA worker during their ANC visits is the major cause of concern. Only one fifth of the respondents in the mountain region were counselled regarding the pregnancy related complications by the service providers. Although, there is overall low coverage in the rural area, but the mountain area within rural area recorded the least coverage across the women of different socio-cultural and economic background characteristics. Therefore, the women belonging to Kathua (plain) are around three times more likely received full antenatal care as compared to those who belongs to Bani (Mountain). Overall, addressing the issue of access to antenatal care services in the mountainous regions of Jammu and Kashmir is crucial for improving maternal health outcomes in the region.

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