# **Original Research Article**

DOI: https://dx.doi.org/10.18203/2394-6040.ijcmph20214265

# An analysis of preferences and practices related to the mode of delivery in Agra district of Uttar Pradesh

Arti Verma<sup>1\*</sup>, Shailendra Singh<sup>1</sup>, Manisha M. Nagargoje<sup>1</sup>, S. K. Mishra<sup>1</sup>, Saroj Singh<sup>2</sup>, Sarvesh Awasthi<sup>3</sup>

**Received:** 20 September 2021 **Accepted:** 22 October 2021

# \*Correspondence: Dr. Arti Verma,

E-mail: drarti010@gmail.com

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

#### **ABSTRACT**

**Background:** Preferences and actual practices in regard to delivery of pregnant women have wide variations. This study is an attempt to explore some of the socio-demographic factors responsible for preferences and practices in regard to mode of delivery among institutional deliveries in Agra district.

**Methods:** This community based descriptive observational study was conducted among 300 eligible women of Agra district who were selected through multistage random sampling. Both bivariate and multivariate analysis was done and appropriate statistical tests were used.

**Results:** The study found that out of 300 subjects; 272 had institutional deliveries among which 265 (97.43%) had a preference for vaginal delivery (VD) while only 7 (2.57%) had a preference for caesarean section (CS) but in actuality, 223 (81.99%) were delivered through vaginal mode while 49 (18.01%) had CS. On multiple logistic regression analysis, mode of delivery in previous pregnancy was found to have a significant association with the preference of a woman in regard to her mode of delivery with odds ratio of 9.88 (95% CI 1.46-66.80) and p=0.019.

**Conclusions:** Preferences in regard to mode of delivery of a woman was only associated with her mode of delivery in previous pregnancy but her actual practice was also significantly associated with her place of delivery in addition to her mode of delivery in previous pregnancy.

**Keywords:** Preference and practice, Mode of delivery, CS, VD

#### **INTRODUCTION**

Cesarean section (CS) without medical necessity is associated with an increase in perinatal complications to mothers and babies than VD in short and long term and also affects the subsequent pregnancies. However, the use of CS has increased dramatically worldwide in the past decades despite no evidence showing that the CS rate of more than 15% can actually reduce the maternal and neonatal morbidity and mortality. CS rates have increased by 15.8 (from 8.7 to 22.8) percentage points over the period of 1990-2018 and are projected to

increase from the current 21.1% to 28.5% (95% CI 23.9% to 33.1%) with more than 38 million caesarean births in  $2030.^3$ 

As per the first round of national family health survey (NFHS-I), conducted in 1992-93, the CS rate was only 2.5% in India which was increased to 7.1% in 1998-99 (NFHS-II), 9% in 2005-06 (NFHS-III) and finally 17.2% in 2015-16 (NFHS-IV).<sup>4-7</sup> There is a vast variation in rates of CS across different states and districts of India. Uttar Pradesh for example had a CS rate of 9.4% which is well below the national average of 17.2% but Agra

<sup>&</sup>lt;sup>1</sup>Department of Social and Preventive Medicine, <sup>2</sup>Department of Obstetrics and Gynaecology Sarojini Naidu Medical College Agra, Uttar Pradesh, India

<sup>&</sup>lt;sup>3</sup>Department of Community Medicine, GMC, Datia, Madhya Pradesh India

district of Uttar Pradesh has a CS rate of 16.3% which is near to the national average.<sup>8</sup> Again there is huge difference between the CS rates in public (4.7%) as well as in the private (31.2%) health facilities in the Uttar Pradesh.<sup>9</sup>

A systemic review and meta-analysis of thirty eight studies has showed that only a minority of women in a wide variety of countries and situations expressed a preference for CS (pooled prevalence of 15.6% with 95% CI: 12.5-18.9) with a higher preference for CS among women with a previous CS versus women without a previous CS (29.4% versus 10.1%), and those living in a middle-income country versus a high-income country (22.1% versus 11.8%).<sup>10</sup> However, such data related to mode of delivery is in paucity in India so with this background, the present study was planned to find out delivery preferences and practices in regard to mode of delivery among women of Agra district and to find some of the socio-demographic as well as ante-natal care factors associated with these preferences as well as the practices.

#### **METHODS**

This descriptive observational study was conducted among eligible women of Agra to find their delivery preferences and practices and to analyze the gap between these preferences and practices in regard to their mode of delivery.

#### Study design

This is a community-based cross-sectional study.

#### Duration of study

The study was conducted between October 2018 to October 2020.

## Research setting

The study was conducted in selected area of Agra district which is situated on western border of Uttar Pradesh surrounded by states of Rajasthan and Madhya Pradesh. According to Census 2011, total population of Agra was 44,18,797 with 20,53,844 females.

#### Place of work

The study carried out at the department of community medicine, S. N. medical college, Agra.

### Research questions

Further questions were asked to participants-What are the delivery preferences and practices among women in Agra district and which socio-demographic factors are associated with preferences and actual practices in regard to mode of delivery among them?

#### Study population

All mothers who delivered within past one year (January 2019-2020) were our study population.

#### Inclusion criteria

All mothers having a live child of less than one year of age and gave informed consent were included in study.

#### Exclusion criteria

Mothers who were sick, didn't give consent, had lost child within one year of birth and had delivered a still birth were excluded from the study.

#### Sample size calculation

For calculation of sample size, prevalence of CS delivery in Uttar Pradesh was taken as reference and by using the formula of  $4pq/d^2$  and taking 9.4% prevalence of CS delivery in Uttar Pradesh (8), a sample size of 131 was calculated with 95% confidence level and 5% margin of error. After considering unreliable or incomplete response a round-off sample size of 150 was finalized for each rural, urban and peri-urban area of Agra district.

#### Sampling technique

Stratified random sampling was used to select one area from each of rural, peri-urban and urban parts of Agra. At first a list of all community development blocks of Agra district was obtained while a separate list of peri-urban and urban wards was prepared from the list of municipal wards of Agra city. For selection of rural area, one primary health center of listed community development blocks was randomly selected at first and in later stages, all the eligible women of the randomly selected village of said PHC was chosen for purpose of study. On the other hand, one ward each from peri-urban and urban area of Agra city was randomly selected at first and later on, one mohalla was randomly selected from each of the selected peri urban and urban ward and all the eligible women of the selected mohalla was included in the study

#### Methodology

A house-to-house visit was planned to find eligible mothers who had a live child of less than one year of age in selected rural (Shyamo village), peri-urban (Ukhara) and urban (Kamla Nagar) area of Agra district but due to COVID-19 pandemic we were not able to collect data of urban area and so, this study restricts its findings to rural and peri-urban areas of Agra district of Uttar Pradesh only. Thus, a total of 300 participants were interviewed with using a pretested, predesigned and structured questionnaire. All interviews were conducted in private, unless the respondents were comfortable with presence of family members and responses were not shared across the families or respondents.

After establishing a good rapport and obtaining verbal consent from participating subjects in every visited household, the information was recorded regarding their socio-demographic profile and preferences and practices related to place and mode of delivery of current child. Place of delivery was either their home or an institution (government or private) while mode of delivery was either normal VD, assisted vaginal deliveries (AVD) or CS delivery. Both NVDs and AVDs were included in VD for purpose of analysis in the present study. Questions related to antenatal and intra-natal events of current birth (e.g., number, place and quality of ante-natal care; presence of ASHA and other decision makers at the time of delivery etc.) as well as any history of abortion and mode of delivery of pervious child were also included in the schedule. The information thus collected was transferred on predesigned classified tables and analyzed through MS excel. Ethical clearance for the study was taken from the institutional ethical committee of S. N. medical college, Agra. Univariate, bivariate as well as multivariate analysis was done and appropriate statistical tests like Pearson's chi square test, Fisher exact test and logistic regression test were used in the study. The statistical analysis has been carried out using STATA software 14.0 version.

### **RESULTS**

The present study found that 272 (90.67%) of 300 deliveries in Agra were performed in an institution either government (58.33%) or private (32.33%) and only 9.33% of the deliveries were conducted at home. Out of total 272 institutional deliveries; 49 (18.01%) were CS while 223 (81.99%) were VDs. Rates of CS and VD at government and private healthcare facility were quite different as 91.43% of deliveries at government facilities and 64.95% of deliveries at private healthcare facility were VDs. Thus, proportion of CS among total deliveries was nearly four-times higher at private facility in comparison to government healthcare facility (35.05% v/s 8.57%) (Table 1).

#### Socio-demographic characteristics

The present study found that most (94.85%) of the subjects who were delivered at an institution were less than 30 years of age. 42.65% of subjects belonged to other backward caste while 16.55% were scheduled caste or scheduled tribe (SC/ST). More than half (56.25%) of the mothers' belonged to joint type of family. Almost all of the subjects belonged to Hindu religion (99.00%). Nearly one third (31.99%) of the mothers and 14.33% fathers were illiterate. Most of the study subjects either belonged to lower middle (46.69%) or lower (32.72%) socio-economic class. Husband of 43.75% subjects were un-skilled workers while only 28.66% were skilled or highly skilled workers. Most of the subjects had either one or two children (33.45% and 45.22% respectively) which mean that majority of mothers had no or one child at the time of delivery in current pregnancy (Table 2).

Majority (88.95%) of mothers had VD in previous pregnancy while 8.45% had a history of abortion. Most (61.76%) of the subjects had four or more antenatal visits while none of the subjects had no antenatal visit. Accredited social health activist (ASHA) was said to be present at most (83.46%) of the institutional deliveries. Almost two third (64.34%) of the deliveries were done at government healthcare institutions.

### Preference and practice in regard to mode of delivery

Of the 272 mothers who were delivered at an institution, majority 265 (97.43%) of women said to have a preference for VD while only 7 (2.57%) had a preference for CS but in actuality, 223 (81.99%) of women were delivered through VD while 49 (18.01%) were delivered through CS (Figure 1).

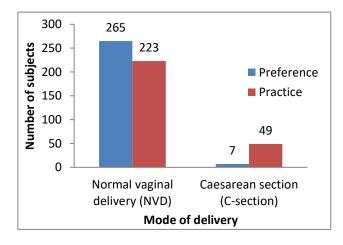


Figure 1: Preference and practice in regard to mode of institutional deliveries, (n=272).

### Factors associated with preference for mode of delivery

Study found that majority (98.76%) of women who had a VD in previous pregnancy had a preference for same mode of delivery in current pregnancy while on the contrary, only 15% of women who had a CS in previous pregnancy preferred same mode of delivery in current pregnancy. So, 85% of women who had a CS during previous pregnancy still preferred to have a normal delivery in current pregnancy (p=0.0003).

Study also shows that only 1.14% of women who got delivered at government health facility had a preference for CS while significantly higher proportion of women (5.16%) who got delivered at private health facility had a preference for CS (p=0.04) (Table 3).

# Factors associated with actual practice in regard to mode of delivery

Study found 10.34% illiterate women were actually delivered through CS, while 19.25% women with 1-12 years of education, 37.5% women with college education

had CS delivery during current pregnancy. So, with increase in education level of women chances of delivery through CS significantly (p=0.007). Similar trends observed with education level of husband (p=0.004).

It was also observed that women with lower parity had significantly higher chance of a CS delivery as only 6.90% women with more than two children had CS delivery in current pregnancy in comparison to 21.03% women with 1-2 children (p=0.01). Thus, mode of delivery in previous pregnancy was found to has a significant association with the mode of delivery in current pregnancy as 3/4<sup>th</sup> women with CS delivery in previous pregnancy has to undergo CS in current pregnancy in comparison to only 9.32% women who had normal delivery in previous pregnancy (p=0.000).

ASHA was said to be present at 84.58% of normal deliveries and 68.89% of CS s deliveries. So, chances of delivery through CS significantly rose with absence of ASHA at the time of delivery (p=0.012).

Study also found that merely 8.57% women who chose government hospital for her delivery had a CS while more than one third (35.05%) women attending private hospital were delivered through CS. So, chances of CS significantly rose with selection of private healthcare facility as place of delivery (p=0.000).

# Logistic regression analysis for preference in regard to mode of delivery

On logistic regression analysis; mode of delivery in previous pregnancy was found only socio-demographic factor which have a significant association with preference of a woman in regard to her mode of delivery in current pregnancy with an odds ratio of 9.88 (95% CI 1.46-66.80) and p=0.019. Place of delivery on the other hand, was found to have no statistically significant association with preference of a woman for a particular mode of delivery on logistic regression analysis (Table 4).

# Logistic regression analysis for practice in regard to mode of delivery

In this mode of delivery in previous pregnancy was found to have a significant association with actual mode of delivery of a woman with an odds ratio of 50.61 (95% CI 10.99-232.89), p=0.000. Similarly, place of delivery was also found to have a significant association with mode of delivery on logistic regression analysis with an odds ratio of 4.79 (95% CI 1.54-14.92), p=0.007. All other factors which were found to have a significant association on univariate analysis (i.e., mother's education, education of her husband, number of children and presence of ASHA at the time of delivery) were found to have no statistically significant association with actual mode of delivery of a woman on multiple logistic regression analysis.

Place of delivery **NVD** CS Ratio of NVD/CS Percentage (%) No. Home 28 28 9.33 **Government healthcare institution** 175 160 15 10.7/158.33 Private healthcare institution 97 63 34 1.8/132.33 **Total** 300 251 49 5.12/1 100

Table 1: Place and mode of delivery among study subjects, (n=300).

Table 2: Socio-demographic variables of subjects who were delivered at an institution, (n=272).

Socio-demographic variables		Number	Percentage (%)
	<19	2	0.74
	19-24	152	55.88
Age (years)	25-29	104	38.24
	30-34	13	4.78
	≥35	1	0.37
	General	111	40.80
Caste	OBC	116	42.65
	SC/ST	45	16.55
T of fo:1	Nuclear	119	43.75
Type of family	Joint	153	56.25
	Illiterate	87	31.99
	1 <sup>st</sup> -5 <sup>th</sup>	44	16.18
Maternal education	$6^{\text{th}}$ - $8^{\text{th}}$	43	15.80
	9 <sup>th</sup> -12 <sup>th</sup>	74	27.21
	UG/PG	24	8.82
	Illiterate	39	14.33
	1 <sup>st</sup> -5 <sup>th</sup>	29	10.66
Education of husband	6 <sup>th</sup> -8 <sup>th</sup>	30	11.02
	9 <sup>th</sup> -12 <sup>th</sup>	138	50.73
	UG/PG	36	13.24

Continued.

Socio-demographic variables		Number	Percentage (%)
SES class	Lower	89	32.72
	Lower middle	127	46.69
	Middle	42	15.44
	Upper middle	7	2.57
	Upper	7	2.57
	Un-skilled	119	43.75
Occupation of husband	Semi-skilled	75	27.57
Occupation of husband	Skilled	69	25.36
	Highly Skilled	9	3.30
	1	91	33.45
Do witer	2	123	45.22
Parity	3	48	17.64
	≥4	10	3.67
Delivery of previous shild	Normal	161	88.95
Delivery of previous child	CS	20	11.05
TT' 4	Yes	23	8.45
History of abortion	No	249	91.55
	1	4	1.47
	2	43	15.80
Number of ANC visits	3	57	20.95
	4	66	24.26
	≥5	102	37.50
ACITA -41	Present	227	83.46
ASHA at hospital delivery	Absent	45	16.54
Type of facility	Government	175	64.34
Type of facility	Private	97	35.66

Table 3: Socio-demographic variables of preferences and practices for mode of delivery.

Socio-demographic variable		Preference (%)		Practice (%)	Practice (%)	
Socio-demograp	onic variable	NVD	CS	NVD	CS	
	<30	252 (97.67)	6 (2.33)	211 (81.78)	47 (18.22)	
Age (Years)	≥30	13 (92.86)	1 (7.14)	12 (85.71)	2 (14.29)	
		$\chi^2=1.22$ , p=0.26		$\chi^2=0.138$ , p=0.70		
	General	110 (99.10)	1 (0.90)	92 (82.88)	19 (17.12)	
Caste	OBC	112 (96.55)	4 (3.45)	91 (78.45)	25 (21.55)	
Caste	SC/ST	43 (95.56)	2 (4.44)	40 (88.89)	5 (11.11)	
		$\chi^2$ =2.220, p=0.32		$\chi^2 = 2.495$ , p=0.28		
	Nuclear	116 (97.48)	3 (2.52)	95 (79.83)	24 (20.17)	
Type of family	Joint	149 (97.39)	4 (2.61)	128 (83.66)	25 (16.34)	
		$\chi^2$ =0.002, p=0.96		$\chi^2 = 0.664$ , p=0.41		
	Illiterate	84 (96.55)	3 (3.45)	78 (89.66)	9 (10.34)	
Maternal	1st-12th class	157 (97.52)	4 (2.48)	130 (80.75)	31 (19.25)	
education	UG/PG	24 (100)	0 (0)	15 (62.5)	9 (37.5)	
		$\chi^2 = 0.63$ , p=0.9		$\chi^2 = 9.802$ , p=0.007		
	Illiterate	38 (97.44)	1 (2.56)	36 (92.31)	3 (7.69)	
Education of	1st-12th class	192 (97.46)	5 (2.54)	164 (83.25)	33 (16.75)	
husband	UG/PG	35 (97.22)	1 (2.78)	23 (63.89)	13 (36.11)	
		$\chi^2$ =0.006, p=0.99		$\chi^2 = 11.008$ , p=0.004		
	Lower	212 (98.15)	4 (1.85)	181 (83.30)	35 (16.70)	
SES class	Middle/Upper	53 (94.64)	3 (5.36)	42 (75)	14 (25)	
	$\chi^2 = 2.179$ , p=			$\chi^2 = 2.329$ , p=0.12		
Occupation of	Unskilled/ semi- skilled	191 (98.45)	3 (1.55)	161 (82.99)	33 (17.01)	
husband	Skilled/ highly skilled	74 (94.87)	4 (5.13)	62 (79.49)	16 (20.51)	
		$\chi^2 = 2.846$ , p=0.09		$\chi^2 = 0.462$ , p=0.49		

Continued.

Socio-demographic variable		Preference (%)		Practice (%)	
Socio-demograp	Jilic variable	NDV	CS	NDV	CS
	1-2	209 (97.66)	5 (2.34)	169 (78.97)	45 (21.03)
Parity	>2	56 (96.55)	2 (3.45)	54 (93.10)	4 (6.90)
		$\chi^2$ =0.224, p=0.63		$\chi^2$ =6.170, p=0.01	
Dollmann of	Normal	159 (98.76)	2 (1.24)	146 (90.68)	15 (9.32)
Delivery of previous child	CS	17 (85)	3 (15)	5 (25)	15 (75)
previous ciliu		$\chi^2$ =12.535, p=0.0003		$\chi^2$ =55.506, p=0.000	
History of	Yes	23 (100)	0 (0)	19 (82.61)	4 (17.39)
abortion	No	242 (97.19)	7 (2.81)	204 (81.93)	45 (18.07)
aboi tion		$\chi^2$ =0.663, p=0.41		$\chi^2$ =0.006, p=0.93	
Number of	Up to 3	101 (97.12)	3 (2.88)	89 (85.58)	15 (14.42)
ANC visits	4 or more	164 (97.62)	4 (2.38)	134 (79.76)	34 (20.24)
AINC VISITS		$\chi^2 = 0.064$ , p=0.79		$\chi^2$ =1.470, p=0.22	
ASHA at	Present	223 (98.23)	4 (1.76)	192 (84.58)	35 (15.42)
delivery	Absent	42 (93.33)	3 (6.67)	31 (68.89)	14 (31.11)
uenver y		$\chi^2$ =3.602, p=0.057		$\chi^2$ =6.261, p=0.012	
True of	Government	173 (98.86)	2 (1.14)	160 (91.43)	15 (8.57)
Type of facility	Private	92 (94.84)	5 (5.16)	63 (64.95)	34 (35.05)
lacinty		$\chi^2$ =4.005, p=0.04		$\chi^2$ =29.629, p=0.000	

Table 4: Logistic regression analysis for preference and practice in regard to mode of delivery of women.

Socio-demographic	Preference		Practice	Practice	
variable	OR (95% CI)	P value	OR (95% CI)	P value	
Maternal education					
Illiterate			Ref.		
1 <sup>st</sup> -12 <sup>th</sup>			1.92 (0.50-7.40)	0.34	
UG/PG			0.32 (0.01-9.98)	0.51	
Husband's education					
Illiterate			Ref.		
$1^{\text{st}}$ - $12^{\text{th}}$			2.45 (0.28-21.08)	0.41	
UG/PG			5.38 (0.34-85.73)	0.23	
Number of children					
1-2			Ref.		
More than 2			0.23 (0.05-1.09)	0.06	
Delivery of previous child					
Normal	Ref.		Ref.		
CS	9.88 (1.46-66.80)	0.019	50.61 (10.99-232.89)	0.000	
ASHA at the time of delivery	y				
Present			Ref.		
Absent			0.27 (0.06-1.24)	0.09	
Place of delivery					
Government	Ref.		Ref.		
Private	5.10 (0.52-50.08)	0.16	4.79 (1.54-14.92)	0.007	

#### **DISCUSSION**

The present study found that out of total 272 women who had an institutional delivery in Agra district; majority (97.43%) have a preference for VD which was comparable with studies done by Ajeet et al, Dogra et al and Moolya et al which found that 91.5, 90 and 80% women in Nagpur, Himachal Pradesh and Mangalore respectively had a preference for VD. 11-13 Our study found that 15% of women who had a CS during previous pregnancy, had preference for CS in comparison to 1.24%

of women who were delivered though VD as probably a woman with previous CS have better understanding and is already convinced for CS delivery. Study by Saoji et al also found that women who preferred CS in Nagpur were more likely to have had previous caesarean delivery (OR, 2.9; p<0.001). Similarly, study by Saxena et al found that 90% of women who had previous CD, preferred CD for this delivery, and 70% of those having previous VD, preferred the same method of delivery. The present study also found that place of delivery have a significant association with preference for mode of delivery on

univariate analysis (p=0.04). However, on multivariate logistic regression analysis; mode of delivery in previous pregnancy was found to be the only variable which has a significant association with preference of a woman in regard to her mode of delivery with an odds ratio of 9.88 (95% CI 1.46-66.80) and p=0.019. This means that mode of delivery in previous pregnancy is a strong determinant of preference of a woman in regard to her mode of delivery in current pregnancy.

The present study found that 18.01% of institutional deliveries in Agra were through CS while 81.99% were VD. Similarly; Watode et al found that among institutional deliveries in rural Amroha (Uttar Pradesh), 88.80% were normal vaginal deliveries and 11.20% were CS. 15 The present study also found that proportion of CS was nearly four-times higher at private healthcare facilities in comparison to government health facilities (35.05% v/s 8.57%) in Agra district. Similar trends with wider variations were observed in NFHS-IV where 34.90% of deliveries in private sector and 5.60% of deliveries in government sector of Agra were found to be through CSs. 16

Regarding factors affecting actual practices in regard to mode of delivery, present study found that majority (89.66%) of illiterate women but only 62.5% women with a graduate or post-graduate degree were delivered through vaginal mode (p=0.007). Study by Divyamol et al also found that women with a UG/PG degree had significantly higher chances of CS in Kerala. Similarly, education of husband was found to has a definite role in mode of delivery as wives of 92.31% illiterate husbands were delivered through vaginal mode while wives of 63.89% husbands with a graduate or postgraduate degree were delivered through vaginal mode (p=0.004). In contrary to our study, Divyamol et al found that women whose husband has a UG/PG degree had significantly higher chances of normal delivery in rural Kerala. 17

It was observed in present study that parity is significantly associated with mode of delivery as chances of CS dropped up to three times (from 21.03% to 6.90%) with increase in number of children (1-2 v/s >2). Similar trends were observed by Kaur et al in Jalandhar (Punjab) and by Maktha et al in rural area of Rangareddy district of Telangana. 18,19

Regarding factors affecting mode of delivery; study found that 75% women who were delivered through CS during previous pregnancy, were actually delivered through CS in current pregnancy as they probably had a lot of adhesions/scars of previous CS and mentally/medically not ready to go through extensive labor pain of VD in current pregnancy. Study by Divyamol et al also found that prevalence of CS was significantly different among those who had previous caesarean deliveries (93%) compared to those who had previous vaginal deliveries (14.5%) among the multiparous women ( $\chi^2$ :72 p=0.0003).<sup>17</sup>

The findings of our study show that absence of ASHA at the time of delivery also significantly raised chances of CS delivery in current pregnancy (15.42% v/s 31.11%) with a p=0.012. The present study also found that significantly higher proportion of women (35.05%) who chose private hospital for delivery were actually delivered through CS in comparison to those who chose government hospital for delivery (8.57%). This finding is in contrast with the studies by Moolya et al, Divyamol et al and Maktha et al which observed that place of delivery is not significantly associated with mode of delivery in rural Kerala, Mangalore (Karnataka) and rural Telangana respectively. 13,17,19 This observation was probably due to differences in utilization of delivery services, work ethics, level of education, empowerment of women and difference in socio-cultural norms in different states of India. On the other hand, study by Saxena et al found that 13% patients delivering in PHCs or government hospitals underwent CD while 49% delivering in private hospitals underwent CD in rural Bangalore (p=0.0001).14

On multiple logistic regression analysis; mode of delivery in previous pregnancy (odds ratio of 50.61 with 95% CI of 10.99-232.89 and p=0.000) and place of delivery (odds ratio of 4.79 with 95% CI of 1.54-14.92 and p=0.007) was found to be significantly associated with actual mode of delivery of a woman in Agra.

#### Limitations

A prospective study can be more useful to assess preferences of prospective mothers regarding mode of delivery at different periods of gestation and at the time of delivery and afterwards to see changes in preferences at different point of time.

#### **CONCLUSION**

The present study shows that mode of delivery of previous child as well as place of delivery of current child was significantly associated with preference making of a woman in regard to her mode of delivery in current pregnancy. On the other hand, her education, education of her husband, parity, mode of delivery of previous child, absence of ASHA at the time of delivery and place of delivery of current child were significantly associated with their actual practice in regard to her mode of delivery in current pregnancy. On multivariate logistic analysis delivery preference of a woman was found to be associated with her mode of delivery in previous pregnancy while on the other hand, her actual practice in regard to mode of delivery was found to be associated with her place of delivery as well as her mode of delivery in previous pregnancy.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

#### REFERENCES

- Keag OE, Norman JE, Stock SJ. Long-term risks and benefits associated with cesarean delivery for mother, baby, and subsequent pregnancies: Systematic review and meta-analysis. PLoS Med. 2018;15(1):e1002494.
- 2. Appropriate technology for birth. Lancet. 1985;2(8452):436-7.
- 3. Betran AP, Ye J, Moller A-B. Trends and projections of caesarean section rates: global and regional estimates. BMJ Global Health. 2021;6:e005671.
- 4. Survey summary: India: standard DHS, 1992-93. The DHS Demographic and Health Surveys Program.1993. Available at: https://dhsprogram.com/what-we-do/survey/survey-display-50.cfm. Accessed on 22 June, 2021.
- International Institute for Population Sciences (IIPS) and ORC Macro. 2000. National Family Health Survey (NFHS-2), 1998-99: India. Mumbai: IIPS. Available at: https://dhsprogram.com/pubs/pdf/ frind2/frind2.pdf. Accessed on 01 July, 2021.
- Survey summary: India: standard DHS, 2005-06. The DHS Demographic and Health Surveys Program. 2006. Available at: https://dhsprogram.com/what-we-do/survey/survey-display-264.cfm. Accessed on 01 July, 2021.
- 7. Survey summary: India: standard DHS, 2015-16. The DHS Demographic and Health Surveys Program.2016. Available at: https://dhsprogram.com/what-we-do/survey/survey-display-355.cfm. Accessed on 01 July 2021.
- 8. International Institute for Population Sciences (IIPS) and ICF. 2017. National Family Health Survey (NFHS-4), India, 2015-16: Uttar Pradesh. Mumbai: IIPS. Available at: http://rchiips.org/nfhs/pdf/NFHS4/UP\_FactSheet.pdf. Accessed on 01 July, 2021.
- International Institute for Population Sciences (IIPS) and ICF. 2017. NFHS-4 Fact Sheets for Key Indicators Based on Final Data - State Fact Sheet Uttar Pradesh Available at: http://rchiips.org/ nfhs/pdf/NFHS4/UP\_FactSheet.pdf. Accessed on 01 July, 2021.
- Mazzoni A, Althabe F, Liu N, Bonotti A, Gibbons L, Sánchez A et al. Women's preference for caesarean section: a systematic review and meta-analysis of observational studies. BJOG. 2011;118(1):391-9.
- 11. Saoji A, Jaydeep N, Kasturwar N, Relwani N. Women's knowledge, perceptions, and potential

- demand towards Caesarean Section. Nat J of Comm Med. 2011;2(2):244-8.
- 12. Dogra P, Sharma R. Preferences of pregnant women regarding mode of delivery: a questionnaire-based study. Int J Sci Rep. 2017;3(11):292-5.
- 13. Moolya S, Rodrigues S, Shimi RS. Preference for normal vaginal delivery or elective caesarean section delivery and factors influencing it among antenatal mothers in selected hospital at Mangalore. Int J Health Sci Res. 2018; 8(8):189-95.
- 14. Saxena RK, Ansari NFT, Balan A. Factors influencing women's choice of mode of delivery in rural Bangalore, India. Indian J Obstet Gynecol Res. 2019;6(1):71-7.
- 15. Watode B, Srivastava A, Kumar R. Factors Affecting the Place of Delivery among Women Living in Rural Amroha, Uttar Pradesh: A Cross-Sectional Study. Int J Med Res Prof. 2019;5(3):311-5.
- 16. International Institute for Population Sciences (IIPS) and ICF. 2017. NFHS-4 Fact Sheets for key indicators based on final data-District Fact Sheet Agra Uttar Pradesh. Available at: http://rchiips.org/nfhs/FCTS/UP/UP\_Factsheet\_146\_ Agra.pdf. Accessed on 01 July 2021.
- 17. Divyamol N, Raphael L, Koshy N. Caesarean section rate and its determinants in a rural area of South India. Int J Community Med Public Health. 2016;3:2836-40.
- 18. Kaur J, Singh S, Kaur K. Current trend of caesarean sections and vaginal births. Adv Appl Sci Res. 2013;4(4):196-202.
- 19. Maktha VK, Ghatam A, Padamata H, Ravulakol A. Prevalence and factors associated with caesarean section: a community based cross sectional study in rural parts of Ranga Reddy district, Telangana, India. Int J Community Med Public Health. 2016;3:2054-7.

Cite this article as: Verma A, Singh S, Nagargoje MM, Mishra SK, Singh S, Awasthi S. An analysis of preferences and practices related to the mode of delivery in Agra district of Uttar Pradesh. Int J Community Med Public Health 2021;8:5310-7.