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Research Article

Knowledge, attitudes and delivery mode preferences among pregnant women in a tertiary hospital, Nepal

Bidhya Gupta*

Author's Affiliations

*Lecturer, Department of Women Health Development, National Medical College Nursing Campus and Teaching Hospital, Birgunj, Nepal

Correspondence to:

Mrs. Bidhya Gupta
Department of Women Health Development,
National Medical College Nursing Campus and Teaching Hospital,
Birgunj, Nepal.
Email: guptarbidhya@gmail.com
ORCID: 0009-0008-8899-7912

ABSTRACT

Background & Objectives: Caesarean section (CS) is life-saving when medically indicated, yet increasing CS use without clear indications is a global concern. Women's knowledge and attitudes influence their preferences and can shape demand for CS. The study aimed to assess knowledge, attitude, and preference toward mode of delivery among pregnant women attending the antenatal clinic of National Medical College, Birgunj.

Materials and Methods: An analytical cross-sectional design was applied to the dataset of total 140 respondents. The knowledge was rated on a 0-44 scale and was divided into poor (<50%) and fair ((50–<75%) and good (≥75%). The participants were assessed on attitudes toward vaginal delivery and CS with two 9-item Likert subscales and were defined as positive (≥60) or negative (<60). The chi-square tests and multivariate logistic regression were used to examine the association.

Results: Mean age was 25.7±3.8 years. Most participants had poor knowledge (58.6%), a negative attitude toward vaginal delivery (60.7%), and a positive attitude toward CS (67.9%). Preference for CS was 50.7%. Knowledge level was associated with preference (p=0.027); compared with fair knowledge, poor knowledge was associated with higher odds of preferring CS (AOR=3.42, 95% CI 1.34–8.69).

Conclusions: Preference for CS was common and co-existed with limited knowledge and

less favorable attitudes toward vaginal birth. Antenatal counseling that supports informed choice and addresses fear, misinformation, and local drivers of CS may help align preferences with evidence-based care.

Keywords: Antenatal care, attitude, caesarean section, childbirth; knowledge, vaginal delivery

INTRODUCTION

Caesarean section (CS) is a major obstetric procedure that can prevent maternal and perinatal morbidity and mortality when complications make vaginal birth unsafe. However, CS is also associated with short and long-term maternal and child risks, particularly when performed without a clear medical indication [1]. At the population level, CS rates above roughly 10% have not been associated with additional reductions in maternal and newborn mortality, and decisions about CS should be driven by clinical need and respectful, woman-centered care [2].

Globally, CS use has risen markedly over the past decades, with large inequalities within and between countries [3,4]. Earlier global estimates documented substantial increases from 1990 to 2014 [5]. In South Asia, CS rates have increased alongside expanding facility births; analysis of Demographic and Health Survey data showed that CS in Nepal increased from 0.8% in 2001 to 11.0% in 2016 to 18% in 2022 [6]. Evidence from urban hospitals in Nepal has highlighted substantial differences between private and public facilities and noted that maternal request can contribute to CS in some settings [7]. The significant determinants of delivery-mode preference are parity and prior obstetric history. Women who have already given birth to a child, especially those who have already had a caesarean section or had a negative birth experience, might have different expectations, fears, and perceived safety issues than nulliparous women. There is evidence that the preference towards caesarean section is more likely to be high among multiparous women compared to primiparous women, and prior caesarean birth establishes a unique decision context between trial of labor and repeat caesarean birth [8,9].

Women's preferences for mode of delivery are shaped by knowledge, perceived safety, prior experiences, information sources, and social norms. Qualitative work has identified fear of childbirth and pain, safety perceptions, and biased or incomplete information as common drivers of CS preference [10]. In the Mutaba'ah cohort, women's knowledge and perceptions were associated with delivery preferences, suggesting that health education and counseling may influence informed choice [11].

In Nepal, a tertiary-care survey reported that most women had positive attitudes toward vaginal birth and a low preference for CS, highlighting the importance of local context and the potential for change over time and across settings [12]. Birgunj is a major urban center in Madhesh Province and receives a diverse population of pregnant women, but local data on knowledge, attitudes, and preferences related to delivery mode are limited.

Therefore, this study aimed to describe knowledge, attitude, and preferred mode of delivery among pregnant women attending the antenatal clinic at National Medical College, Birgunj, and to explore factors associated with preference for CS.

MATERIALS AND METHODS

Study design and setting: This analytical cross-sectional study was conducted at the antenatal clinic of National Medical College and Teaching Hospital, Birgunj, Nepal.

Participants and sample size: The study included 140 pregnant women attending the antenatal clinic of National Medical College and Teaching Hospital, Birgunj, from 1 June 2025 to 30 November 2025. All eligible women who attended the clinic during the study period were approached for participation. Of the 169 women approached, 140 consented and completed the interview, giving a response rate of 82.8%. Women who did not provide consent, were seriously ill at the time of data collection, or had incomplete responses were excluded from the final analysis. For estimation of a single proportion in a cross-sectional study, the required sample size was calculated using $n = Z^2pq/d^2$, assuming maximum variability (p = 0.50), 95% confidence level (Z = 1.96), and precision of 8.3%, which yielded an estimated sample of approximately 140 participants. As the study was conducted in a single antenatal clinic, the findings should be interpreted with caution and may not be generalizable to all pregnant women in Birgunj or Nepal.

Variables and measurement tools: Sociodemographic variables included age group, age at marriage group, education of the woman and her husband, residence, family income, and main source of information. Knowledge, attitude, and preference measures were adapted from previously published tools assessing delivery-mode knowledge and attitudes.[12,13] Variables such as parity, previous caesarean section, obstetric risk status, and fear or anxiety related to childbirth were not included in the present analysis, as they were not collected in the original study instrument. This study was therefore limited to the assessment of selected sociodemographic characteristics, knowledge, attitudes, and preferred mode of delivery. The omission of these obstetric and psychosocial factors should be acknowledged as a limitation, as they may influence women's delivery preferences.

Knowledge scoring: Knowledge regarding modes of delivery was summarized as a total score (0–44) and classified into poor (<50%), fair (50–<75%), and good (≥75%) levels.[13]

Attitude scoring: Attitude was assessed using two 9-item subscales (attitude toward vaginal delivery and attitude toward CS). Each items was scored on a 3-point Likert scale, giving a total score range of 9 to 27 per subscale. For interpretation, a 60% threshold of the maximum possible score was applied, consistent with the referenced tool; since 60% of 27 is 16.2, scores ≥17 were classified as positive attitude and scores <17 as negative attitude.[13]

Outcome variable: The primary outcome was preferred mode of delivery (vaginal delivery vs CS).

Statistical analysis: Descriptive statistics were used to summarize participant characteristics. Bivariate associations between preferred mode of delivery and selected factors were first assessed using the chi-square test. Variables with $p < 0.05$ in bivariate analysis were then included in the multivariable logistic regression model to estimate adjusted odds ratios and 95% confidence intervals for factors associated with preference for caesarean section. Statistical significance was considered at $p <$

0.05. However, adjustment for confounding was restricted to the variables collected in the study, and unmeasured factors such as parity, previous caesarean section, obstetric complications, and childbirth-related fear could not be controlled for.

Ethical considerations: Ethical clearance for the study was obtained from the Institutional Ethics Committee of National Medical College, Birgunj, Nepal (Ref. F-NMC/782/080-081). Informed oral and written consent was taken from the informant (patient and patient party) as per the protocol of the study method. Patient confidentiality was strictly maintained for the study purposes.

RESULTS

Table 1 shows the socio-demographic profile of the 140 pregnant women that were used in the study.

The average age of the participants was 25.7 years old and the average age at which they got married was 21 years old. A majority of the women were those who were between the ages of 20-25 years (57.1%), and most married (70.0%). The majority of the respondents were well-educated with a university-level education (60.0%), and half of their husbands were well-educated as well (50.7). Women had a higher number of those who reported lack of sufficient income in their family (62.1) and those that lived in rural settings (66.4). The most prevalent source of information about mode of delivery was media (37.1%), and then health workers and family/friends (28.6 each), but only a small percentage (5.7) of them referred to educational sessions or booklets. The average level of knowledge was 19.6, SD 12.0 (1-44) and the average level of attitudes was 16.3, SD 5.6 (vaginal delivery) and 18.9, SD 5.0 (cesarean section).

The spread of the levels of knowledge among the pregnant women is represented in figure 1. Most of the participants lacked knowledge on modes of delivery especially in the poor

Table 1: Socio-demographic characteristics of participants

Variable	Categories	Frequency (n)	Percentage (%)
Age	20-25 years	80	57.10
	26-30 years	42	30.00
	31-35 years	18	12.90
Age at marriage	< 20 years	42	30.00
	20-25 years	98	70.00
Educational level of Women	Can read and write	14	10.00
	Upto Secondary Level	42	30.00
	University Degree	84	60.00
Husband's education	Can read and write	15	10.70
	Upto Secondary Level	54	38.60
	University Degree	71	50.70
Family Income	Not enough	87	62.10
	Enough	53	37.90
Residence	Rural	93	66.40
	Urban	47	33.60
Main source of information	Health worker	40 (28.6)	28.60
	Family/Friends	40 (28.6)	28.60
	Media	52 (37.1)	37.10
	Education sessions/booklet	8	5.70

level (n = 82) and 33 women were in the fair level of knowledge. The number of participants who had a good knowledge level was only 25, which shows that the level of awareness of the population regarding delivery modes was low before the specific educational interventions were delivered to them.

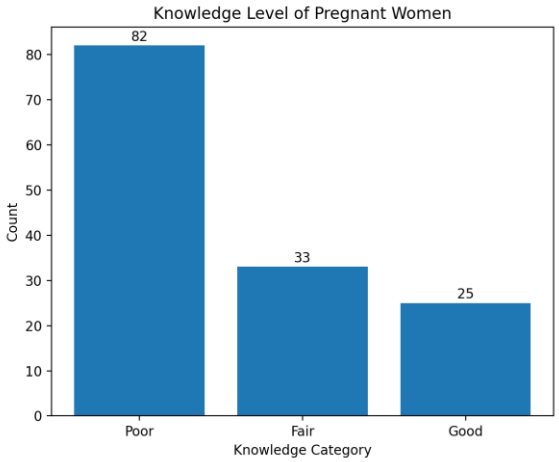

Figure 1: Level of Knowledge among Pregnant Women

The attitude of the pregnant women towards various modes of delivery is represented in figure 2.

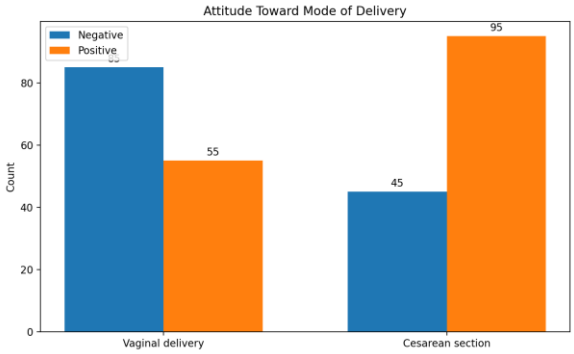

Figure 2: Attitude towards mode of delivery

A more significant percentage of the participants reported their negative attitude to vaginal delivery (n = 85) than to positive attitude (n = 55). Conversely, the responses to cesarean section were generally positive and 95 participants expressed positive attitude, 45 others expressed negative attitude (Fig. 2).

Figure 3 presents the mode of delivery that is preferred by the pregnant women. Almost equal percentages of the respondents favored cesarean section (n = 71) and vaginal birth (n = 69). Nevertheless, there was a tendency towards cesarean section even though the preference was slightly higher, which is a hint of a slight inclination to cesarean delivery among the participants of the study.

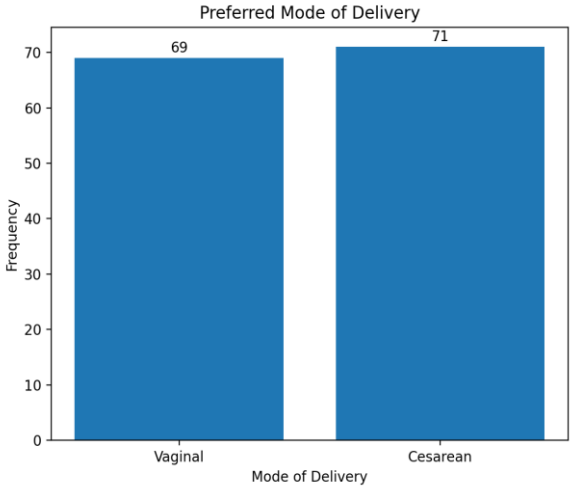

Figure 3: Preferred mode of delivery among pregnant women

Table 2 presents the relationship between the choice of delivery and other preferred demographic factors of women. They found no statistically significant relationship between the educational level of women, their residence, their family income, and their primary source of information and the preferred mode of delivery ($p > 0.05$).

Despite the fact the cesarean section was more popular among women with secondary education and those living in the rural regions whereas vaginal delivery was comparatively much higher among women with reading and writing abilities, urban residents and those

Table 2: Association of Women's Demographics with Preferred Mode of Delivery

Variables	Categories	Mode of delivery		p-value
		Caesarean section	Vaginal Surgery	
Women's Education	Can read and write	5 (35.7%)	9 (64.3%)	0.373
	Secondary	24 (57.1%)	18 (42.9%)	
	University	42 (50.0%)	42 (50.0%)	
Residence	Rural	51 (54.8%)	42 (45.2%)	0.232
	Urban	20 (42.6%)	27 (57.4%)	
Family Income	Not enough	44 (50.6%)	43 (49.4%)	0.893
	Enough	27 (50.9%)	26 (49.1%)	
Main Source of Information	Health worker	16 (40.0%)	24 (60.0%)	0.199
	Family/Friends	25 (62.5%)	15 (37.5%)	
	Media	27 (51.9%)	25 (48.1%)	
	Education sessions/booklet	3 (37.5%)	5 (62.5%)	

Table 3: Association of Knowledge and Attitude with Preferred Mode of Delivery

Factors	Categories	Mode of delivery		p-value
		Caesarean section	Vaginal Surgery	
Knowledge level	Poor	47 (57.3%)	35 (42.7%)	0.027
	Fair	10 (30.3%)	23 (69.7%)	
	Good	14 (56.0%)	11 (44.0%)	
Attitude	Negative	39 (45.9%)	46 (54.1%)	0.212
	Positive	32 (58.2%)	23 (41.8%)	

receiving information accessing health workers or during educational lessons, they were not statistically significant.

Table 3 shows the bivariate relations of the knowledge level, attitude, and the preferred mode of delivery among women. The level of knowledge and preference towards cesarean section were found to have a statistically significant relationship (p = 0.027). The poor level of knowledge used to mean that the women who had a poor level of knowledge were likely to prefer cesarean section and the ones with fair level of knowledge preferred vaginal delivery more.

Contrastingly, attitude towards mode of delivery did not indicate a statistically significant relationship with mode of delivery preference (p = 0.212) but the women who positively rated mode of delivery were relatively more inclined to cesarean section.

DISCUSSION

This study outlined the knowledge, attitudes, and preferences of pregnant women regarding the mode of delivery in an antenatal clinic sample at National Medical College, Birgunj. About 50 percent of the respondents favored caesarean section, and poor knowledge and negative attitudes towards vaginal delivery were prevalent. Despite the necessity of caesarean section as a life-saving procedure when medically necessary, the ongoing increase in its prevalence has led to concerns regarding unnecessary interventions, preventable risks, and disparities in access to proper obstetric care [3,4].

The percentage of women who favored caesarean section in this study was significantly greater than that of a previous Nepalese tertiary-care study, in which only a small percentage of women indicated that they would prefer caesarean birth given the choice [12]. This difference can be both a

change over time and a contextual difference across study settings. The current population may be biased towards caesarean section due to the growing medicalization of childbirth, the broadening of knowledge about facility-based delivery, increased exposure to media and informal sources of information, and the belief that caesarean birth is safer, less painful, or more predictable than vaginal birth. Recent data in urban Nepal has demonstrated that the rates of caesarean section can be particularly high in certain hospital environments, especially in the context of the private sector, and that maternal request can be present alongside clinical indicators [7]. In this regard, women in a tertiary-care facility might be more exposed to discourses that legitimize caesarean birth as a contemporary, convenient, or safer choice, which could be one of the reasons behind the increased preference in this study. Other settings have also found fear of labour pain, fear of poor fetal outcomes, and incomplete or biased information to be significant contributors to caesarean preference [10].

Preferred mode of delivery was significantly related to knowledge level. Poorly informed women were more likely to prefer caesarean section than their fairly informed counterparts. This observation aligns with the existing literature that suggests that the preferences of women are not only influenced by clinical factors but also by their level of knowledge, safety beliefs, and misinformation or fear-inducing stories [10,11]. Misconceptions about pain, recovery, fetal safety, and convenience in an environment where family members, media, or community networks are the sources of information about childbirth instead of formal antenatal education can lead to caesarean preference.

The percentage of participants who had a negative attitude towards vaginal delivery and a more positive attitude towards caesarean section was higher, although the statistical relationship between attitude and delivery preference was not significant. This can imply that attitudes are conditioned by larger cultural and institutional perceptions that cannot be well represented by mere preference questions. There is also a possibility that some of the participants gave answers that they thought were socially acceptable in a hospital environment. This social desirability bias could have influenced self-reported knowledge and attitudes, especially when respondents were under pressure to seem knowledgeable, cooperative, or in line with what they believed to be medically approved opinions. Thus, the attitudes and preferences observed are to be taken with a grain of salt.

These results justify the need to reinforce antenatal counseling with evidence-based information on both vaginal birth and caesarean section that is balanced. WHO recommendations focus on respectful, woman-centred communication and shared decision-making during pregnancy and childbirth [14]. Counseling in Birgunj and other such environments can be more effective when it is tailored to the most common fears of labor pain, fears of fetal safety, misinformation disseminated by the media or social networks, and the perception that caesarean section is safer or easier. Engaging family members in counseling, providing culturally relevant educational resources, and supporting evidence-based signs of caesarean section can assist women in making more informed choices and decrease preference based on fear or misinformation [4,13].

The sample in this study was only taken in one antenatal clinic, which restricts the ability to generalize the results to the broader population of Birgunj or Nepal. Moreover, the research was based on self-reported measures of knowledge and attitude, which can be influenced by recall error and social desirability bias. The dataset did not include important obstetric and psychosocial variables such as parity, previous caesarean section, obstetric risk status, and fear or anxiety about childbirth, and thus residual confounding may occur. Lastly, the cross-sectional design determines associations but fails to determine causal relationships among knowledge, attitudes, and delivery preference.

CONCLUSIONS

Preference for caesarean section was common and was associated with lower delivery-mode knowledge. Strengthening antenatal counseling and respectful, woman-centered communication may therefore help support informed preferences and appropriate use of caesarean section. In Birgunj, practical strategies should include incorporating structured discussion of the risks, benefits, and medical indications of both vaginal delivery and caesarean section into routine antenatal care, providing culturally appropriate education that addresses fear of labor pain and misconceptions about safety, engaging family members in shared decision-making, and promoting evidence-based use of caesarean section through consistent counseling by skilled health workers.

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