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Effect of Counseling in Patients Booked for Elective Caesarean Section Delivery as Choice of Anesthesia

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ABSTRACT

Background: Cesarean section rates are rising globally, yet many women remain inadequately informed about anesthesia options, contributing to anxiety and potentially suboptimal choices in elective procedures. Addressing this gap, structured preoperative counseling may improve knowledge, reduce anxiety, and influence anesthesia preferences in women scheduled for elective cesarean delivery. **Objective:** This randomized controlled trial aimed to evaluate the effect of structured preoperative counseling on anesthesia choice, procedural knowledge, and preoperative anxiety among women undergoing elective cesarean section. **Methods:** In this single-center, single-blind RCT, 100 term pregnant women aged 19–40 years scheduled for elective cesarean section were randomized into structured counseling (n = 50) and standard counseling (n = 50) groups. Women with obstetric emergencies, contraindications to anesthesia, or spontaneous vaginal delivery were excluded. Counseling protocols included standardized leaflets and face-to-face education, with data collected on sociodemographics, anesthesia preference, anxiety, and knowledge using validated tools. Ethical approval was obtained per the Declaration of Helsinki. Statistical analyses were performed using SPSS version 23, with chi-square and t-tests applied as appropriate. **Results:** Regional anesthesia was chosen by 58% in the structured counseling group versus 34% in standard care (p = 0.013). The structured group demonstrated significantly lower mean anxiety scores (20.53 ± 0.74 vs. 27.86 ± 3.21; p < 0.001) and higher procedural knowledge (25.23 ± 2.14 vs. 14.07 ± 1.96; p < 0.001). **Conclusion:** Structured preoperative counseling significantly increases preference for regional anesthesia, enhances procedural knowledge, and reduces anxiety in women undergoing elective cesarean section. Integrating comprehensive counseling into routine obstetric care can optimize informed decision-making and improve perioperative outcomes in real-world clinical practice.

Keywords: Cesarean Section, Anesthesia, Patient Counseling, Preoperative Anxiety, Knowledge, Regional Anesthesia, Randomized Controlled Trial

INTRODUCTION

Childbirth is a profound life event that may be empowering and transformative for many women, especially following uncomplicated vaginal deliveries. However, for others, it can be associated with significant anxiety, fear, and a sense of lost control, particularly when medical interventions are required. Cesarean section (CS) is a surgical procedure involving incisions in the abdominal and uterine walls, performed for various medical indications such as placenta previa or abnormal fetal presentation, and is often life-saving for the mother or baby when adverse outcomes are anticipated (1). In recent years, however, the rate of cesarean sections has risen globally, not only for clear medical indications but also for less specific reasons and maternal requests, particularly in well-resourced healthcare systems (2).

According to global estimates, approximately 18.5 million cesarean sections are performed each year, with 3.6% occurring in the absence of specific medical or surgical indications (4). The World Health Organization (WHO) recommends an optimal CS rate of 10–15% of all births and cautions against unnecessary procedures due to associated risks and healthcare costs (5). Despite these guidelines, the global CS rate increased from 12.1% in 2000 to 21.1% in 2015, and is projected to reach 28.5% by 2030, with substantial regional variations—ranging from 7.1% in Sub-Saharan Africa to 63.4% in Eastern Asia (6,7). The rising prevalence of cesarean deliveries has significant implications, including financial burdens for families and healthcare systems (8).

Current clinical guidelines advocate for the routine use of neuraxial anesthesia, such as spinal or epidural, for cesarean deliveries, citing lower maternal risks and improved postoperative outcomes compared to general anesthesia (9,10). The success of such guidelines in practice, however, often depends on effective communication and shared decision-making between patients and healthcare providers (11). The WHO emphasizes that effective, culturally appropriate communication throughout antenatal and intrapartum care is essential to ensure informed choices and respectful maternity care (12,13,14).

Informed consent remains a cornerstone of shared decision-making, requiring healthcare professionals to provide patients with accurate, comprehensible information about procedures and available options. However, challenges in physician-patient communication are particularly pronounced in resource-limited settings, where disparities in education, language, and healthcare access may impede patient understanding and satisfaction (15).

Despite recommendations and best practices, anxiety surrounding anesthesia choice remains common among patients scheduled for cesarean delivery. Inadequate counseling can exacerbate fear, diminish patient knowledge, and negatively influence anesthesia preference. Conversely, structured preoperative counseling may enhance procedural understanding, reduce anxiety, and support informed anesthesia choices, leading to improved patient outcomes.

This study aims to compare patient preference for anesthesia in elective cesarean sections with and without preoperative counseling. Secondary objectives include evaluating the impact of sociodemographic factors on counseling effectiveness, as well as differences in anxiety levels and procedural knowledge among participants who receive structured counseling compared to those who do not.

MATERIALS AND METHODS

This single-center, single-blind randomized controlled trial was conducted in the Department of Anaesthesia, Combined Military Hospital, Sialkot, Pakistan, over a six-month period. The study followed the CONSORT 2010 guidelines for randomized trials (www.consort-statement.org). A total of 100 pregnant women aged 19 to 40 years, at term gestation (greater than 37 weeks), and scheduled for elective cesarean section were recruited using a consecutive non-probability sampling technique from the hospital's patient registry. Written informed consent was obtained from all participants prior to enrollment, ensuring voluntary participation and confidentiality in accordance with the Declaration of Helsinki. Patients were excluded if they presented with obstetric emergencies (such as antepartum hemorrhage, cord prolapse, eclampsia, disseminated intravascular coagulation, vertebral column deformities, fetal distress, or obstructed labor), contraindications to neuraxial or general anesthesia, or if they had previously delivered via spontaneous vaginal delivery.

Randomization was achieved through the lottery method, whereby each eligible participant blindly drew a sealed envelope from a box containing pre-randomized assignments to Group A

or Group B in a 1:1 ratio, resulting in 50 women per group. This process ensured allocation concealment and minimized selection bias. In this single-blind design, participants were aware of the type of counseling received, while the outcome assessors and data analysts were blinded to group assignment to reduce observer bias.

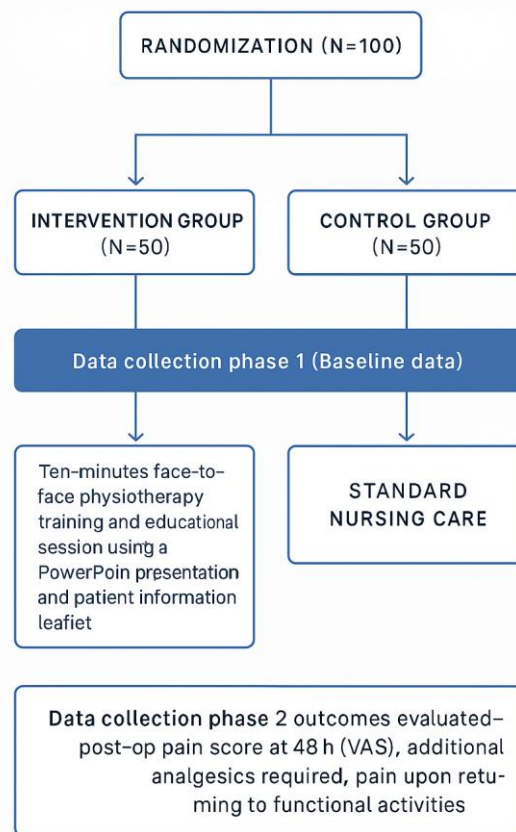


Figure 1 Data Collection Procedure Schema

Group A received standard preoperative counseling conducted by the attending anesthesiologist, which included a brief explanation—delivered in Urdu—of the available anesthesia options (regional or general), along with their general risks and benefits. The patient's anesthesia preference was documented at the end of this session. Group B, in addition to the routine counseling, received a structured one-on-one counseling session with a trained member of the research team, immediately following the standard session. This structured counseling utilized educational brochures and patient information leaflets from the Obstetric Anaesthesia Association UK, which were available in both English and Urdu. The materials were chosen for their comprehensiveness and accessibility, and have been previously utilized in international settings for patient education; their content was locally adapted for language and cultural relevance. During these sessions, patients received a detailed explanation of the anesthesia techniques, perioperative expectations, and statistical frequencies of potential complications, as outlined in the leaflets. Participants were encouraged to ask questions, and any concerns were addressed thoroughly. Following the counseling, all patients received an

Urdu-language informational leaflet to reinforce the verbal discussion.

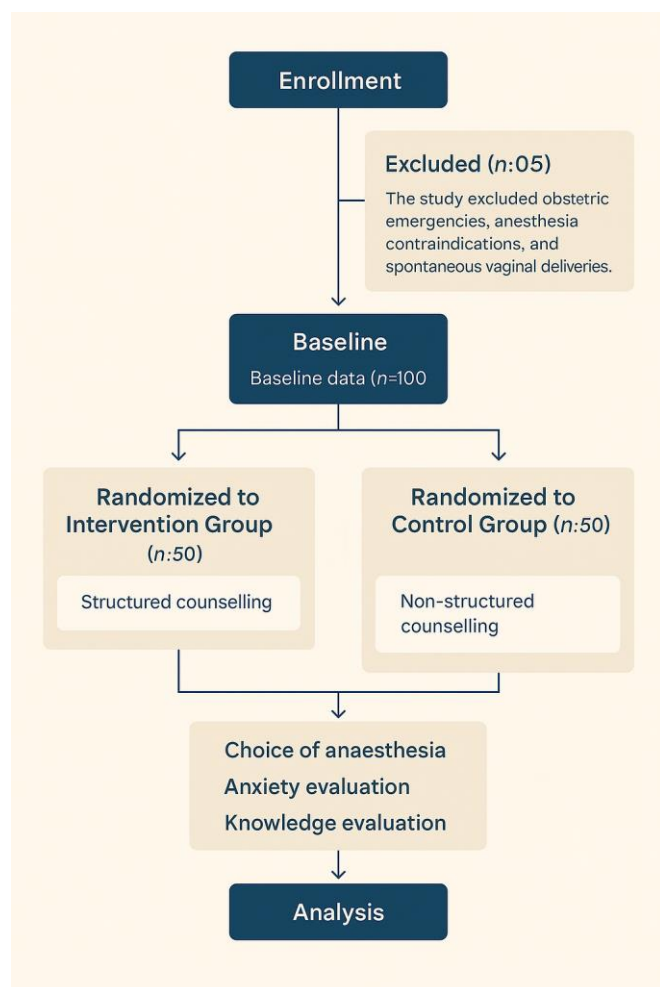


Figure 2 CONSORT Flowchart

Both groups completed a pre-surgery questionnaire that collected demographic and clinical data, including age, educational attainment (illiterate, primary, middle, matric, or intermediate), monthly household income (categorized as <20,000 PKR, 20,000–50,000 PKR, or >50,000 PKR), obstetric history, and anesthesia preference. Anxiety and procedural knowledge were assessed using structured questionnaires developed specifically for this study based on validated formats used in previous trials (16), with items addressing core aspects of anesthesia understanding and preoperative anxiety. Each knowledge questionnaire consisted of multiple-choice questions on anesthesia-related facts, while anxiety was measured using a standardized numerical scale. Both questionnaires were pretested for clarity in a pilot group and refined accordingly to ensure content validity.

The primary outcome was the patient's choice of anesthesia (regional versus general) following counseling. Secondary outcomes included the effects of sociodemographic variables on counseling efficacy and preoperative anxiety and knowledge scores. Data analysis was performed using SPSS version 23. Frequencies and percentages were calculated for categorical variables, while means and standard deviations were computed for continuous variables. The Chi-square test was applied to evaluate the association between counseling and anesthesia choice, and to assess differences across sociodemographic strata. Pre- and post-counseling anxiety and knowledge scores were compared between groups using the paired t-test. A p-value of <0.05 was considered statistically significant throughout the analysis. All data were handled confidentially, and participants' identities were protected by de-identifying records prior to analysis. Ethical approval was obtained from the hospital's institutional review board prior to study commencement. The study was conducted in compliance with ethical principles and guidelines as outlined in the Declaration of Helsinki.

RESULTS

Baseline sociodemographic and clinical characteristics of the participants are summarized in Table 1. In both study arms, the majority of participants were aged 31–40 years, accounting for 82% in Group A and 70% in Group B, while the remaining participants were aged 18–30 years (18% in Group A and 30% in Group B). The education level varied across the groups, with most participants in Group A having completed intermediate (48%) or matriculation (40%) education, compared to Group B, where the largest subgroup had a middle school education (30%), followed by matric (36%) and primary education (14%). Illiteracy was uncommon, observed in only 2% of Group A and 6% of Group B. In terms of socioeconomic status, half of Group A (50%) and a higher proportion of Group B (60%) reported a monthly household income below 20,000 PKR. A further 30% in Group A and 22% in Group B earned between 20,000–50,000 PKR, while higher income (>50,000 PKR) was seen in 20% of Group A and 18% of Group B.

Most participants had not undergone previous surgery (76% in Group A; 88% in Group B). Regarding the type of anesthesia chosen at baseline, 34% of Group A and 56% of Group B initially opted for regional anesthesia, while general anesthesia was selected by 66% and 44% respectively. Most participants were experiencing their first pregnancy (78% in Group A, 86% in Group B), with smaller numbers reporting one or more previous pregnancies. The majority of women in Group A were classified as underweight (50%), whereas most in Group B had a normal BMI (54%).

Table 1. Baseline Sociodemographic and Clinical Characteristics of Participants

Variable	Category	Group A (n = 50)	Group B (n = 50)
Age	18–30 years	9 (18%)	15 (30%)
	31–40 years	41 (82%)	35 (70%)
Education level	Illiterate	1 (2%)	3 (6%)
	Primary	2 (4%)	7 (14%)
	Middle	3 (6%)	15 (30%)
	Matric	20 (40%)	18 (36%)
	Intermediate	27 (54%)	17 (34%)

Variable	Category	Group A (n = 50)	Group B (n = 50)
Monthly income (PKR)	Intermediate	24 (48%)	7 (14%)
	< 20,000	25 (50%)	30 (60%)
	20,000–50,000	15 (30%)	11 (22%)
	> 50,000	10 (20%)	9 (18%)
Previous surgery	No	38 (76%)	44 (88%)
	Yes	12 (24%)	6 (12%)
Type of anesthesia	Regional	17 (34%)	28 (56%)
	General	33 (66%)	22 (44%)
Previous pregnancies	0	39 (78%)	43 (86%)
	1	6 (12%)	4 (8%)
	2	3 (6%)	1 (2%)
	3	1 (2%)	1 (2%)
	> 3	1 (2%)	1 (2%)
BMI	Underweight	25 (50%)	20 (40%)
	Normal	16 (32%)	27 (54%)
	Overweight	9 (18%)	3 (6%)

Table 2. Comparison of Anesthesia Preference Between Groups

Type of Anesthesia	Group A (n = 50) n (%)	Group B (n = 50) n (%)	χ^2 (df)	P value
Regional	17 (34%)	29 (58%)	3.184 (1)	0.013*
General	33 (66%)	21 (42%)		

*P value < 0.05; CI: 95%

Table 3. Association Between Sociodemographic Factors and Counseling

Variable	Category	Group A n (%)	Group B n (%)	χ^2 (df)	P value
Age	18–30 years	9 (18%)	15 (30%)	1.37 (1)	0.008**
	31–40 years	41 (82%)	35 (70%)		
Education level	Illiterate	1 (2%)	3 (6%)	4.92 (4)	0.039*
	Primary	2 (4%)	7 (14%)		
	Middle	3 (6%)	15 (30%)		
	Matric	20 (40%)	18 (36%)		
	Intermediate	24 (48%)	7 (14%)		
Monthly income	< 20,000	25 (50%)	30 (60%)	4.06 (3)	0.069
	20,000–50,000	15 (30%)	11 (22%)		
	> 50,000	10 (20%)	9 (18%)		
Previous pregnancies	0	39 (78%)	43 (86%)	1.59 (4)	0.81
	1	6 (12%)	4 (8%)		
	2	3 (6%)	1 (2%)		
	3	1 (2%)	1 (2%)		
	> 3	1 (2%)	1 (2%)		

*P value < 0.05; **P value < 0.001; CI: 95%

Table 4. Comparison of Anxiety and Knowledge Levels Between Groups

Variable	Group A (n = 50) Mean \pm SD	Group B (n = 50) Mean \pm SD	Mean Difference \pm SD	t-test	P value
Anxiety levels	27.86 \pm 3.213	20.53 \pm 0.739	7.33 \pm 3.38	17.21	0.0001**
Knowledge	14.07 \pm 1.96	25.23 \pm 2.136	11.16 \pm 2.41	54.36	0.0001**

**P value < 0.001; CI: 95%

When comparing anesthesia preference following intervention (Table 2), a marked difference was observed between the two groups. In Group A (standard counseling), only 17 participants (34%) chose regional anesthesia, compared to 29 participants (58%) in Group B, who received structured counseling. Conversely, general anesthesia remained the preferred choice for 66% in Group A and only 42% in Group B. The difference in anesthesia preference was statistically significant ($\chi^2 = 3.184$, df = 1, p = 0.013). An analysis of sociodemographic factors and their association with counseling outcomes (Table 3) revealed several

key patterns. Younger women (aged 18–30 years) were more likely to be found in Group B (30%) compared to Group A (18%), with a statistically significant association ($\chi^2 = 1.37$, p = 0.008). Education level was also associated with counseling efficacy, as a higher proportion of Group B participants had only completed up to middle school (30%) compared to Group A (6%), and fewer in Group B had completed intermediate education (14% vs. 48%). The association between education and counseling was significant ($\chi^2 = 4.92$, df = 4, p = 0.039). Socioeconomic status, assessed via monthly income, did not differ significantly

between groups ($p = 0.069$). Similarly, the distribution of previous pregnancies was not significantly different between groups ($p = 0.81$).

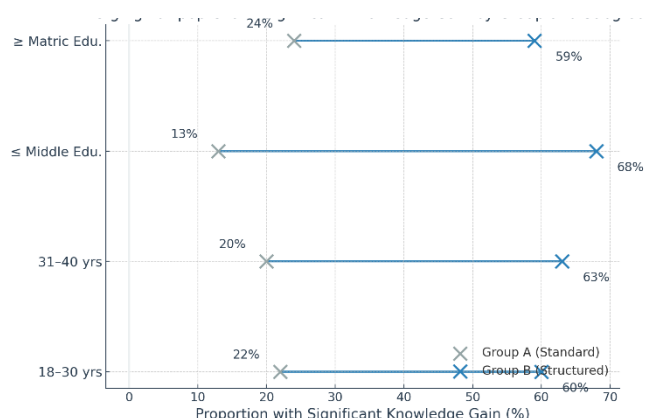


Figure 3 Proportion with Significant Knowledge Gain

Assessment of anxiety and knowledge levels (Table 4) showed significant improvements in the group that received structured counseling. The mean anxiety score in Group B was substantially lower (20.53 ± 0.739) compared to Group A (27.86 ± 3.213), with a mean difference of 7.33 ± 3.38 ($t = 17.21$, $p = 0.0001$). Knowledge scores were notably higher in Group B, with a mean of 25.23 ± 2.136 versus 14.07 ± 1.96 in Group A; the mean difference was 11.16 ± 2.41 ($t = 54.36$, $p = 0.0001$). Both findings were highly statistically significant ($p < 0.001$), indicating that structured counseling not only reduced patient anxiety but also enhanced their understanding of anesthesia options.

DISCUSSION

This randomized controlled trial demonstrates that structured preoperative counseling has a significant influence on anesthesia choice, procedural knowledge, and preoperative anxiety in women undergoing elective cesarean section. Participants who received enhanced, structured counseling were substantially more likely to prefer regional anesthesia over general anesthesia, a finding that aligns with the growing body of evidence supporting the clinical advantages of neuraxial techniques in obstetric anesthesia. These advantages include not only reductions in perioperative mortality and major postoperative complications but also shorter operative times, decreased intraoperative blood loss, lower postoperative pain scores, and reduced length of hospital stay (17,18,19). The present study advances prior research by directly linking these preferences to the implementation of a dedicated, culturally adapted counseling protocol.

Integrating these findings with the existing literature highlights both consistency and nuance in the understanding of patient education and decision-making in anesthesia. Previous studies have emphasized the impact of patient-centered counseling on informed consent and shared decision-making, particularly in surgical settings where the choice of anesthesia may profoundly affect both clinical outcomes and patient experience (20,21). Our results echo those of trials in other surgical populations, where targeted education has led to greater patient satisfaction, improved knowledge retention, and a notable reduction in perioperative anxiety (23,24,25). This trial further underscores

the importance of addressing misconceptions about anesthesia—an area where general anesthesia has often been erroneously perceived as safer or less frightening in some cultures, possibly due to fear of intraoperative awareness or procedural pain. By dispelling myths and clarifying real risks through structured education, the counseling intervention enabled more informed and confident decision-making among participants.

The relationship between sociodemographic factors and counseling efficacy observed in this study deserves particular attention. Consistent with some earlier investigations, age and education level emerged as significant moderators of counseling impact, with younger women and those with lower educational attainment showing greater benefit from structured intervention. This may be due to lower baseline health literacy or greater initial anxiety in these groups, making them more receptive to comprehensive education. However, the literature remains divided, as other studies have not found a strong association between demographic variables and anesthesia-related decision-making (22). Such discrepancies likely reflect contextual differences in study populations, healthcare infrastructure, and cultural attitudes toward medical authority and informed consent. The present study, conducted in a single center in Pakistan, thus fills a critical gap by demonstrating that even in resource-constrained settings, patient-centered educational approaches can overcome informational barriers and empower more diverse groups of patients.

The mechanisms underlying these improvements appear to be twofold: first, the delivery of information in the local language using culturally relevant materials increased accessibility and comprehension; second, the interactive, one-on-one format allowed patients to voice their concerns and have misconceptions directly addressed. The result was not only a statistically significant increase in procedural knowledge but also a marked reduction in preoperative anxiety scores. This supports theoretical models in health psychology that link perceived control and understanding with reduced anxiety and greater satisfaction with care.

Despite its strengths—including a rigorous randomized design, blinded outcome assessment, and the use of validated assessment tools—this study has several limitations. The most significant is its limited generalizability, as the trial was conducted in a single tertiary care center with a relatively homogeneous population. Socioeconomic, cultural, and healthcare system differences in other regions may limit the direct applicability of these findings. The sample size, although adequate to demonstrate the primary outcome, may have limited power to detect more subtle interactions between sociodemographic variables and counseling efficacy. Additionally, the follow-up period was restricted to the perioperative timeframe, precluding analysis of longer-term outcomes such as satisfaction with anesthesia choice, postoperative recovery, or effects on future childbirth decisions. The exclusive use of face-to-face counseling also leaves open the question of whether similar benefits could be achieved with group education or digital resources, which might be more scalable in larger populations.

Given these considerations, future research should prioritize multicenter studies with broader, more diverse populations and extended follow-up periods to capture longer-term patient-reported outcomes. Investigations comparing different modes of education—such as group sessions, telemedicine, or multimedia interventions—may also reveal more efficient or accessible means of delivering preoperative counseling, particularly in resource-limited settings. Further, qualitative studies exploring patient and provider perspectives could provide deeper insights into the barriers and facilitators of shared decision-making in anesthesia.

In conclusion, this study affirms the clinical and psychological value of structured, patient-centered counseling prior to elective cesarean section. By promoting informed choice, reducing anxiety, and increasing procedural knowledge, such interventions have the potential to improve both patient experience and perioperative outcomes. Widespread adoption of structured counseling, tailored to local needs and delivered in culturally sensitive formats, should be considered an essential component of modern obstetric care.

CONCLUSION

In conclusion, this randomized controlled trial demonstrates that structured preoperative counseling significantly influences anesthesia choice, enhances procedural knowledge, and reduces preoperative anxiety among women scheduled for elective cesarean section, as compared to standard counseling. The findings underscore the pivotal role of targeted patient education in empowering women to make informed decisions regarding their anesthesia options, with a marked increase in preference for regional anesthesia observed among those receiving comprehensive counseling. These results have important implications for human healthcare, highlighting that integrating structured counseling into routine obstetric care can optimize patient-centered outcomes, improve satisfaction, and potentially reduce perioperative risks. Clinically, implementing such educational interventions may foster shared decision-making and align practice with global standards of respectful maternity care, while future research should explore the scalability, long-term effects, and adaptability of these interventions across diverse healthcare settings.

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