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Knowledge, Attitudes, and Perceptions Toward Locoregional Anesthesia Among the Adult Population in Saudi Arabia: A Cross- Sectional Survey

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Abstract

Background: Patient acceptance of locoregional anesthesia (LRA) is often hindered by psychological barriers and misconceptions. However, LRA offers notable clinical advantages. Saudi Arabia's 2030 vision for patient care requires an understanding of public perceptions. This study's goal is to determine what the Saudi population knows, thinks, and feels about LRA.

Methods: This prospective cross-sectional survey depended on a structured questionnaire circulated to adults aged 18 years and older and executed through all five SA's administrative regions from January to April 2026, excluding healthcare professionals. Demographics, knowledge, attitudes, and past anesthesia experiences were gathered.

Results: A total of 448 participants responded to the survey (74.3% = women, and 46.4% = the ages of 18- 29). 78.8% preferred LRA to general anesthesia (GA); there were major disparities in knowledge: only 36.2% correctly identified epidural anesthesia (EA), and 46% incorrectly classified GA as a LRA type. Fear of intraoperative awareness (31.7%) was the main reason for the responders' hesitance. Multivariate analysis revealed that housing region ($\beta = 0.183$, $P < 0.001$) and education level ($\beta = -0.148$, $P = 0.003$) were significant predictors of EA knowledge. Females exhibited superior LRA knowledge for caesarean section (CS) ($P = 0.007$)

Conclusion: there is an immense impact of Saudi adults with positive attitudes towards LRA in comparison to ignorance about it. There is an urgent need for targeted, culturally tailored educational interventions to address fears, correct misconceptions, and support detailed, true consent.

Introduction

LRA employs numerous techniques, such as spinal anesthesia, EA, and peripheral nerve blocks, that provide the required analgesia and anesthesia. LRA is considered the gold standard in certain surgical practices over GA. LRA provides lower systemic opioid requirements, fewer systemic complications, and faster recovery. Enhanced recovery after surgery (ERAS) protocols are now the goals of well-designed and effective worldwide healthcare systems that recommend LRA as a key part of high-quality perioperative care. (1, 2)

Even though LRA has clear benefits, patients occasionally reject it. Deep-seated psychological barriers and false beliefs are the main reasons for this rejection. The choice of patients based on their intense fear of intraoperative awareness and the fear of permanent paralysis may overcome the clinical evidence. Although different studies have been performed in SA, concentrating on the effect of demographics on pregnant women, there are still research gaps regarding SA adults' knowledge and attitudes towards LRA. Well- designed and effective healthcare systems must identify these specific barriers and misconceptions to mitigate anxieties that prevent patients from selecting safer and preferable anesthesia choices. (3, 4)

This research proves highly timely for SA because it fits closely with SA's Vision 2030 of healthcare transformation. The patient-centered care that stresses the importance of making informed choices and being health knowledgeable is the main key to this transformation. With the development of the SA medical community, it is important to consider how demographic factors affect patients' knowledge, attitude, and perceptions. The kingdom necessitates improvement of surgical outcomes and patient satisfaction through providing anesthetic practices in line with autonomy and the safety of the patient. (5, 6)

This study is intended to address these challenges by evaluating the existing knowledge, attitudes, and perceptions of the SA population regarding LRA. The main goal is to explore what the population already knows and what common misconceptions affect their choices about anesthesia. Secondary objectives encompass the comparison of perspectives on LRA versus GA, the analysis of demographic influences, the effects of prior experiences, the identification of prevalent misconceptions, and the assessment of future willingness of LRA.

Methods

This research utilized a descriptive, prospective, cross-sectional observational survey design. The research was performed throughout the whole SA, including five administrative regions (central, western, eastern, northern, and southern) in both urban and rural settings from January to April 2026. The target population consisted of the general adult demographic (Saudi and non-Saudi individuals aged 18 years and older), able to give well-informed consent, and fill out the questionnaire (either on their own or in an interview).

Population under 18 years old, healthcare professionals (physicians, nurses, and technicians) with greater knowledge than the public, and those who refuse to provide informed consent were not allowed to participate.

The survey was developed by the research team following a comprehensive review of the relevant literature on public knowledge and perceptions of locoregional anesthesia (supplementary file 1). Prior to the commencement of full data collection, a pilot study was conducted among 30 participants to evaluate the clarity, comprehensiveness, and administrative efficiency of the questionnaire. Responses obtained during the pilot phase were excluded from the final dataset.

The Institutional Review Board, Faculty of Medicine, Al-Baha University, SA, gave its approval for this survey on December 24, 2025, with approval number IRB/SUR/BU-FM/2025/15. The study followed the guidelines set out in the Declaration of Helsinki. Participants were fully informed of the study's purpose and assured that their data would be confidential.

Before the start of the survey, all eligible participants offered their informed consent electronically. The first page of the questionnaire provided a full explanation of the study's purpose, that the participation was voluntary, and the right to leave at any time without penalty. The participant must choose "YES" to

give their written consent before the start of the study. Questionnaire. All responses were gathered anonymously, and the data were securely maintained to ensure confidentiality.

The data were collected using a structured, self-administered questionnaire in both Arabic and English. There were three parts of the questionnaire. The first part asked for demographic data, such as age group, sex, final educational level, housing region, occupation, previous surgical history, and previous anesthetic experiences. The second section examined the participants' knowledge of locoregional anesthesia, including types, common uses, benefits, and side effects. The final section focused on evaluating participants' attitudes toward and willingness to consider locoregional anesthesia for future exposure to anesthesia.

For data analysis, descriptive statistics were used to summarize the data, including counts and percentages. To assess the adequacy of knowledge and information across various demographic and obstetric factors, the study applied the Chi-Square test, Kruskal Walli's test, and Mann Whitney test. The normality of the data was evaluated using the Kolmogorov Smirnov test and the Shapiro-Wilk test. To identify determinants of knowledge (as suggested by the analytical component of the design), bivariate analysis was conducted. Multivariate predictors of knowledge were evaluated by multiple regression analysis. Cronbach's α was used to assess the reliability (internal consistency) of the questionnaire using a 5-point Likert scale, which evaluated the attitude and perception of the candidate.

A P-value of less than 0.05 was considered statistically significant. The Statistical Package for the Social Sciences (SPSS), version 28, was used to perform the whole analysis. The 95% confidence level, 5% error margin, and 50% prevalence rate were formalized to figure out the lowest sample size recommended, which is 385. A 15% contingency was used to ensure that the results were strong enough to handle the surveys with non-response and incomplete response.

Results

A total of 448 participants completed the survey (Fig. 1). Internal consistency for the 7 attitude-based questions was evaluated using Cronbach's α, presenting a coefficient of 0.732, indicating acceptable reliability.

As shown in Table 1, the majority of participants were women (n = 333; 74%). The most represented age group was 18–29 years (n = 208; 46%). Geographically, the Southern area showed the highest participation (n = 127; 28%), followed by the Western area (n = 112; 25%).

Over half of the participants held a Bachelor's degree (n = 244; 54%). Most participants were either employed (n = 171; 38%) or students (n = 138; 31%).

Over half of the participants (n = 233; 52%) offered a history of previous surgery. Among these individuals, the most common type of anesthesia used was GA, accounting for 46% (n = 108) of surgical cases.

Participants showed varying levels of knowledge about LRA types (Table 2). While most correctly identified spinal anesthesia (n = 327; 73.0%) and local anesthesia (n = 328; 73.2%) as forms of LRA, awareness of EA was poor, with only 36.2% (n = 162) answering correctly and 38.3% (174) indicating they did not know. A significant number incorrectly believed GA was an LRA type (n = 206; 46.0%).

The assessment of participants' knowledge of the clinical applications of LRA revealed significant discrepancies across procedure types. Awareness was highest for its use in CS (n = 317; 70.8%) and post-labor pain management (n = 266; 59.4%). As for other surgeries, only 37.9% (n = 170) were aware of its use in knee/hip surgeries, and 29% (n = 130) were aware of its use in appendectomies. Regarding the benefits of LRA, a majority of the population identified its role in faster recovery (n = 295; 65.8%), reducing postoperative nausea (n = 290; 64.7%), and reducing respiratory complications (n = 284; 63.4%). However, a notable knowledge gap persists regarding its postoperative analgesic effects, correctly identified by only 46.4% (n = 208) of participants, while 28.8% (n = 129) remained uncertain.

Overall, responders offered a favorable attitude toward LRA. A significant majority (n = 353; 78.8%) represented a preference for LRA over GA, provided it is clinically safe. Furthermore, there was a high level of trust in medical experience; 83.9% (n = 376) represented a confidence in the physician's decision-making, and 71.4% (n = 320) explicitly confirmed they were competent. Additionally, 62.5% (n = 280) emphasized the necessity of a detailed preoperative explanation of the risks and benefits associated with LRA.

Despite the generally positive feedback, several participants were hesitant to accept LRA. The primary concern cited by 31.7% (n = 142) was that they didn't want to see or hear what was happening intraoperatively. Other fear-based barriers were also present, with 22.5% (n = 101) presenting fear of pain or potential surgical complications.

Significant associations ($P < 0.05$) were observed between demographic variables and specific knowledge outcomes (Tables 6–14).

Age was a significant determinant of knowledge regarding EA, local anesthesia, regional blocks, and GA. Respondents aged 18–29 demonstrated distinct knowledge profiles compared to older participants, especially regarding EA and regional blocks.

Females demonstrated significantly better understanding of LRA's use in CS ($P = 0.007$) and post-labor pain management ($P = 0.013$), while males demonstrated higher accuracy regarding GA ($P = 0.001$).

The geographical region similarly impacted knowledge across multiple outcomes, such as awareness of spinal anesthesia, EA, and local anesthesia, as well as regional blocks and several clinical uses, such as CS, appendectomies, and post-labor pain management.

Higher education was significantly linked to better knowledge of EA ($P < 0.001$), local anesthesia ($P = 0.012$), regional blocks ($P = 0.02$), GA ($P = 0.008$), and LRA use for post-labor pain management ($P < 0.001$).

Participants with prior surgical experience also showed significantly better knowledge of EA (P = 0.004) and LRA in CS (P = 0.007) and post-labor pain management (P = 0.021). The anesthesia type used in previous surgeries was a significant predictor of knowledge of spinal anesthesia (P = 0.003), EA (P < 0.001), and GA (P = 0.01).

Multiple regression analyses were conducted to identify independent predictors of knowledge, accounting for all demographic and clinical factors.

The model for EA significantly predicted knowledge levels ($F(6,226) = 8.409$, $P < 0.001$, adjusted $R^2 = 0.161$), with region ($\beta = 0.183$, $t = 4.865$, $P < 0.001$) and education ($\beta = -0.148$, $t = -2.969$, $P = 0.003$) emerging as significant predictors.

Similarly, the model for GA knowledge accounted for 16% of the differences observed, with gender and region identified as significant predictors. In contrast, models for spinal and local anesthesia and regional blocks knowledge provide no statistical significance.

Regarding post-labor pain management, the predictive model was significant, demonstrating 10.8% of the variance ($F(6,226) = 5.696$, $P < 0.001$). Housing region and education level were significant independent predictors of LRA knowledge scores. Those from certain housing regions were linked with higher knowledge of LRA ($\beta = 0.272$, $t = 4.039$, $P < 0.001$), while those with higher education levels were correlated with higher knowledge ($\beta = -0.130$, $t = -2.022$, $P = 0.04$). Notably, no significant demographic predictors were identified for knowledge regarding CS, appendectomies, and knee/hip surgeries when the same model was applied (all $P > 0.05$).

Discussion

To our knowledge, this is one of the first large-scale, cross-sectional assessments of public perception toward LRA, conducted specifically across the Saudi adult demographic and all administrative regions.

The main results of this survey, which had 448 participants, show a clear and clinically important difference between positive global attitudes toward LRA and a detailed understanding of its mechanisms. A significant majority (78.8%) favored LRA over GA, and there was a high level of confidence in anesthesiologists (83.9%). However, this favorable perception is comprised of significant knowledge gaps. The majority of people are confused about different anesthesia types. For example, almost half (46%) of the people who answered incorrectly classified GA as LRA type, and a surprising 38.3% of them did not know what EA was. The major difference between the people being willing to accept LRA and not understanding its different techniques demonstrates that the informed consent process and perioperative care pathway in SD are inadequate.

Our findings closely align with regional trends observed in surrounding Gulf Cooperation Council (GCC) countries regarding anesthetic phobia and information sources. Aldobekhi FSS et al. performed a comparable cross-sectional study on anesthesia- related fears in the Eastern Province of SA,

demonstrating that anxiety concerning LRA was primarily shaped by non-medical narratives circulated among family members and social networks, rather than clinical experiences. (7) Our data also shows that the main reason for the hesitance of the people was the intraoperative awareness (31.7%), which made worse stores in the community. The fear of paralysis (10%) is a myth that is still very common in the field, even though modern LRA practices have rare cases of permanent neurological injury. Because of these health beliefs, people's education needs to be culturally appropriate and directly address the effect of social networks on medical decision-making.

Globally, the public's inability to differentiate between local infiltration, neuraxial blocks, and peripheral nerve blocks is a well-documented issue. Aferayne NR et al.'s research on public awareness in Western populations indicated that fewer than 40% of patients could correctly distinguish between spinal anesthesia and EA, irrespective of their education level. (8) Our research confirms the presence of a common health education gap, highlighting an unusual characteristic in spinal anesthesia, the significant regional variation in knowledge across SA regions. The multivariate analysis determined that the housing region (specifically Southern versus Northern) serves as an independent predictor of knowledge regarding EA and post-labor pain management ($\beta = 0.272$, $P < 0.001$). This regional mismatch probably means that people in different areas have different access to specialist healthcare promotion and education programs.

Moreover, the correlation between elevated educational attainment and enhanced awareness of LRA benefits, especially reduced respiratory complications, supports Shebl MA et al. and Demirel A et al. concerning health literacy as a mediator of perioperative anxiety across various cohorts. (9, 10)

Ultimately, the specific fear of paralysis aligns with the results of Alsufyani et al., who identified it as a predominant issue among SA patients regarding spinal anesthesia. (11)

There are a number of limitations with this study that should help clarify the results.

Because of the cross-sectional methodology, we are only able to identify correlations rather than draw conclusions about the relationship between demographics and knowledge gain.

Second, there is a built-in sampling bias because the survey was done online and interviews. This means that it may not accurately represent older people (only 4.5% of the included responders were over 65 years old) or people in rural regions who do not know how to use computers or do not have internet access. This probably explains why there are so many young women with bachelor's degrees (74.3% female) and why the results can't be applied to the general SA males and the elderly.

Third, social desirability bias may have led to an overestimation of trust in anesthesiologists, as individuals in a conservative society might hesitate to voice disagreement with medical authority figures during a survey.

Finally, even though we looked at all five administrative regions, the fact that most of the people who participated were from Southern and Western provinces (53.3% combined) means that the results from

the Northern and Eastern regions may not be as accurate.

We suggest three recommendations that can be done in line with SA's vision 2030 healthcare transformation pillar, which is focused on patient-centered care and preventive medicine.

First, the Ministry of Health should use the fact that the Sehhaty and Tawakkalna digital platforms are so popular to create a short, multimedia educational module on LRA safety. This intervention should clarify the difference between types of numbness and paralysis. The goal is directly to reduce widespread fear of numbness and paralysis.

Second, we support the creation and use of standardized preoperative counselling scripts and visual aids for anesthesiologists to use during the pre-anesthetic clinic visits. These tools should proactively overcome specific misconceptions such as intraoperative awareness and needle phobia, thereby converting the consent process from just a legal formality to a valuable educational process.

We indicate that the Central Board for Accreditation of Healthcare Institutions (CBAHI) add metrics for patient awareness of anesthetic choice to the national hospital accreditation criteria. This would encourage institutions to fix the gap between what they know and what they do.

Conclusion: While the SA population exhibits a commendable and trustworthy attitude towards LRA and anesthesiologists, this study indicates an inadequate foundation of specific knowledge that differs according to geography and educational level. This widespread confusion between GA and LRA, combined with rooted fears, surrounding awareness, and paralysis, underscores an urgent need for a well-structured, culturally informed patient education process. In the kingdom's rapidly evolving perioperative surgical model, it is crucial to close these particular knowledge gaps with focused digital health interventions and improved physician-to-physician communication to ensure that patients truly understand what they are consenting to, accelerate recovery, and enhance patient satisfaction.

Declarations

- Ethics approval and consent to participate: The Institutional Review Board, Faculty of Medicine, Al-Baha University, SA, gave its approval for this survey on December 24, 2025, with approval number IRB/SUR/BU-FM/2025/15. Before the start of the survey, all eligible participants offered their informed consent electronically.
- Consent for publication: Not applicable
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Mishari M Beragdar: Supervision, Methodology, Writing – review and editing. Juberahamad R Attar: Writing – original draft, Formal analysis. Reham Almahdi Writing – original draft, Conceptualization. Hatoon A Alzahrani: Writing – original draft, Data curation. Faisal A Al-Ghamdi: Writing – review and editing. Majed M Alziyadi: Writing – review and editing, Validation. Ziyad Khalid: Writing – original draft, Data curation. Ziyad A Alawni: Writing – original draft, Data curation. Albaraa N Almoshigeh: Writing – original draft, Data curation. Renad M Alharbi: Writing – original draft, Data curation. Hussam Rajhi: Writing – review and editing, Formal analysis

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Tables

Tables 1 to 14 are available in the Supplementary Files section.

Figures

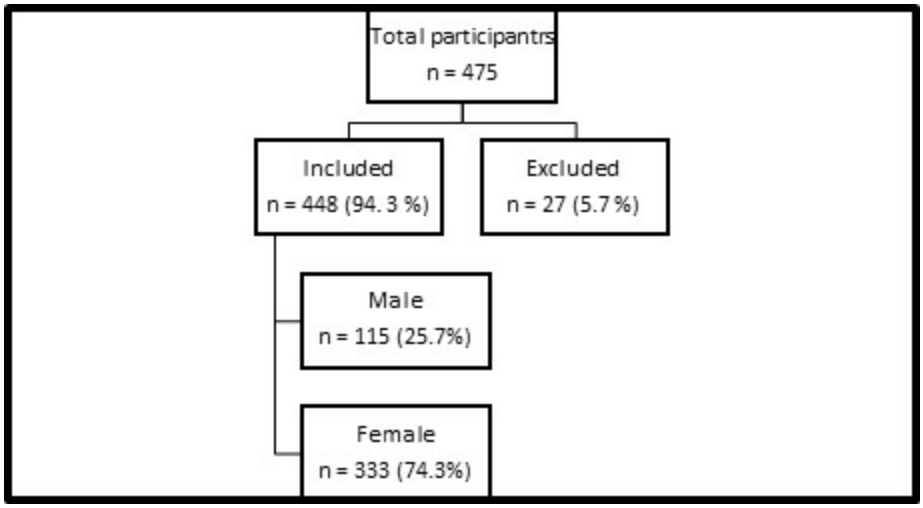


Figure 1

Legend not included with this version.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- FinalResults2.pdf
- SupplementaryFile1Questionnaire.pdf
- unnamed.png