European Review for Medical and Pharmacological Sciences 2023; 27: 2994-3002

# Obstetric neuraxial analgesia – is it a matter of ethnic disparity?

A. PETRIĆ[1,2], R. ŽIVADINOVIĆ[1,2], D. MITIĆ[1,2], P. VUKOMANOVIĆ[1,2], I. KOSTIĆ[3], A. ŽIVADINOVIĆ[1]

[1]Gynecology and Obstetrics Clinic, University Clinical Center of Niš, Niš, Serbia
[2]Faculty of Medicine, University of Niš, Niš, Serbia
[3]Health Center Niš, Niš, Serbia

**Abstract. – OBJECTIVE: Pain is an essential element of humane childbirth. Neuraxial analgesia is the most effective method for relieving pain during childbirth. More and more women are using this type of analgesia in childbirth. The aim of the study was to identify ethnic differences in the application of neuraxial analgesia.**

***SUBJECTS AND METHODS:*** **The research was conducted through a face-to-face survey. The respondents are patients after vaginal delivery. The experimental group consists of patients of the ethnic minority, the Romani group (32 women), and the control group consists of patients of the majority, the Serb group (99 women). We investigated the quality and quantity of prenatal care, information about regional anesthesia, and its application in these two groups.**

***RESULTS:*** **There is a significant ethnic disparity between the Serb and Romani ethnic groups. Patients of the Romani ethnic group have qualitatively and quantitatively poorer antenatal care, less information regarding the use of neuraxial analgesia, and use it significantly less often.**

***CONCLUSIONS:*** **Neuraxial analgesia must be available to all patients regardless of ethnicity or social status.**

*Key Words:*
Neuraxial analgesia, Ethnicity, Disparity.

## Introduction

During childbirth, every woman across the world is particularly vulnerable, especially because childbirth is an event accompanied by pain. Most women in labor experience pain, although they do not experience it all in the same way. Social factors can affect a woman's acceptance of pain and her ability to handle it[1].

In obstetrics, a number of pharmacological and non-pharmacological methods are used to alleviate childbirth pain. Women report different, often mixed, experiences when using different pain relief methods[2]. Obstetric neuraxial analgesia (NA) is the most effective method for relieving labor pain[3]. Childbirth pain is complex and pregnant women should participate in the decision-making process regarding the analgesia modalities[4]. Pharmacological methods alleviate pain in patients, whereas non-pharmacological techniques can enhance the bond between patients and healthcare professionals or birth supporters, resulting in a greater sense of self-efficacy and satisfaction with the childbirth experience. The patient must know the advantages and disadvantages of each method for pain relief[2].

Obstetric NA is widely used today. It can be considered the gold standard in pain relief[5]. The number of women seeking an NA who are afraid of labor pains is growing rapidly[6]. Nevertheless, the overall satisfaction of women in labor does not depend only on the quality of analgesia, but also on the attitude of the staff and the quality of care provided to the woman during childbirth[5,7].

In addition to pharmacological methods, relaxation techniques, massages, acupuncture, and acupressure can be used to relieve pain[7]. The application of these methods brings satisfaction to the patient due to the possibility of pain management and the reduced need for pharmacological analgesia[7]. Water birth is also one of the options for non-pharmacological pain management[8]. Proponents of water birth claim that water helps the mother to relax, and that the heat reduces pain. Large studies show that water birth can be used in the first, second and third stages of labor. Although the probability of completing the birth vaginally is the


*Corresponding Author:* Aleksandra Petrić, MD; e-mail: aleksandra.petric@medfak.ni.ac.rs

same as with other methods, the probability of NA application decreases[9].

The rate of maternal and fetal morbidity is unchanged in water births, as is the rate of neonatal and maternal infections[9]. The perception and reaction to pain depend on personality traits, age, level of education, experience, religious beliefs, and culture[10].

Cultural diversity affects both the perception and intensity of labor pain[10]. Patients with applied NA tolerate pain better, and neonatal results are quite good, except for a slightly higher rate of instrumental delivery[3]. However, there is a risk that the use of NA will be less common in women of minority groups, immigrant women, and women from certain geographical areas[11]. Patients in minority groups have less information about the availability and benefits of NA and are often less educated. Sometimes there are also language barriers[3].

Disparities in perinatal care exist across different ethnic groups, ranging from disparities in the quantity and quality of prenatal medical examinations, obstetric outcomes, and even the use of NA. The disparity is defined as a difference greater than 10% compared to the control group[12]. Disparities that occur in the application of obstetric analgesia are multifactorial but very significant because pain is an important factor in childbirth.

The process of identifying an individual's ethnic background often relies on self-identification by the patient, but this approach can give rise to various challenges and ethical dilemmas. One such dilemma is the phenomenon of "ethnic mimicry", where individuals from minority groups may feel compelled to falsely identify as members of the dominant ethnic group to improve their treatment outcomes. For instance, Roma patients may sometimes identify as members of the majority group, and their self-identification may change over time, as documented in census records[13].

In Serbia, according to the 2011 census, there are 147,604 Roma or about 2.1% of the population. Statistics show ethnicity as a personal commitment[13]. The number of members of the Romani population is unreliable due to their lifestyle, the weakly expressed ethnic identity and the need for better incorporation into society. According to the 2011 census, most Romani live in Eastern and Southern Serbia (38.7%). In these areas, the distribution is uneven, but they are most prevalent in the municipalities of Vranje, Bujanovac, Niš, Aleksinac, and Leskovac. The average number of live births in 2011 was 1.46 for the female population of Serbs and 3.56 - 2.59 for Romani women[13]. According to these data, Romani women give birth to more children and are younger at the time of giving birth to their first child in comparison with Serbian women.

## Subjects and Methods

The research was conducted at the Clinic for Gynecology and Obstetrics in Nis (Southeastern Serbia). The subjects included in this study were all patients who had a vaginal delivery at this clinic. We noticed that patients of minority groups (the Romani ethnic group) use NA less often in childbirth. We have tried to confirm the observed disparity and the leading cause. Two groups were set: a group of Romani patients (32 respondents-experimental group) and a group of patients of Serbian nationality, the majority ethnic group (99 respondents- control group). The research was conducted using a survey. The survey was submitted orally in a face-to-face interview with the examiner. All patients communicated in Serbian. Patients determined their ethnicity by self-identification. The patients answered the examiner's questions related to prenatal controls, reproductive characteristics, and behavior, as well as questions related to the use of analgesia in childbirth. All patients answered the questions voluntarily. The survey was conducted in the obstetrics department, at least 24 hours after delivery.

The research hypothesis is that patients of the Roma ethnic group have a lower level of perinatal protection, have less information about NA, and that in this group NA is significantly less often used.

### Statistical Analysis

Data are presented as an arithmetic mean and standard deviation in the form of absolute and relative numbers. Comparison of continuous values was performed by *t*-test or Mann-Whitney test depending on the data distribution. The comparison of categorical variables was performed by the Chi-square test or Fisher's test of exact probability. The hypothesis was tested with a significance threshold of $p < 0.05$. Statistical data processing was performed in the software package R (The R Foundation for Statistical Computing, Vienna, Austria).

## Results

The survey included 131 women, 99 Serbs, and 32 Romani women. The demographic and clinical characteristics of the respondents are shown in Table I. The average age of the examined population is 28.05 ± 6.25 years (Min 14 years, Max 42 years). The number of marriages was statistically significantly different in relation to nationality ($p = 0.042$). The first menstruation occurs statistically significantly earlier in the Romani population ($p = 0.018$). Painful menstruation is more frequent in the Serbian population (49.5% vs. 21.95%, $p = 0.011$). The Romani women had their first sexual intercourse at a significantly younger age (16.30 ± 2.65) compared to Serbian women (18.34 ± 2.82) ($p < 0.001$). Romani women have, on average, statistically significantly fewer sexual partners compared to the Serbian population ($p < 0.001$). Abortions are statistically significantly more common in the Romani population (34.4% *vs.* 17.1%, $p = 0.044$). The number of pregnancies is statistically significantly different in relation to nationality ($p = 0.001$). The frequency of regular control differs statistically significantly in relation to nationality (100.0% *vs.* 62.5%, $p < 0.001$). The Romani women were statistically significantly less likely to take the Double test ($p < 0.001$), Triple test ($p <0.001$), OGTT ($p < 0.001$), and less likely to go to pregnancy counseling centers ($p = 0.023$). A quarter of Romani women had heard of analgesia (25.0% *vs.* 96.0%, $p < 0.001$). The Romani women are statistically significantly less likely to plan NA use (9.4% *vs.* 42.4%, $p < 0.001$), and less likely to use NA (12.5% *vs.* 38.4%, $p = 0.012$). The Romani women experience their first pregnancy significantly younger than the Serbian women ($p < 0.001$).

In the study population, 45 women (34.4%) planned to use NA. Table II shows the demographic and clinical characteristics of patients who want and plan for NA. Women who plan to use NA are statistically more frequent in their first marriage (97.8% *vs.* 89.5, $p = 0.047$). NA is statistically significantly more often planned in the first pregnancy (64.4% *vs.* 29.1%, $p < 0.001$). Pregnant women planning NA statistically more often visit a doctor during pregnancy ($p < 0.001$). The results indicate that patients who undergo a greater number of intentional pregnancy terminations are less likely to plan to use NA (29.1% *vs.* 11.1%, $p = 0.035$). Pregnant women planning to use NA were statistically more likely to take the Double test ($p = 0.017$), and more likely to take the OGTT test ($p < 0.001$). Pregnant women planning NA were statistically significantly more likely to hear about the possibility of analgesia (100.0% *vs.* 67.4%, $p < 0.001$). Vacuum extraction is statistically significantly more common in pregnant women with NA (15.6% *vs.* 2.3%, $p = 0.013$). Women planning to use NA were statistically significantly older in the first pregnancy ($p < 0.001$). 95.6% of women who plan to use NA and 69.8% of women who do not plan to use NA know about contraception ($p = 0.001$). Pregnant women planning NA are more often primiparous, i.e., they have statistically significantly fewer births ($p < 0.001$).

## Discussion

Annually, about 3,000-3,300 women give birth in our institution, where non-pharmacological methods of pain control are not implemented. Prior to the pandemic, patients in the final weeks of pregnancy received an examination and consultation with an anesthesiologist about the use of NA. Patients are provided with detailed information about possible complications associated with anesthesia, ranging from frequent and mild to severe. Written consent is obtained from the patient for the administration of NA.

The use of regional anesthesia is on the rise, as more and more informed patients request it and it has become commonplace among anesthesiologists' expertise. It has also been widely accepted in obstetrics as a method for relieving childbirth pain. However, the shortage of anesthesiologists during the pandemic led to the suspension of consultations during pregnancy, and NA was not possible for patients who desired it. The presence of a partner or another person during delivery is possible, but due to pandemic-related circumstances, it has been paused for two years. The decrease in Covid-19 cases in the intensive care units resulted in an increase in active anesthesiologists in our maternity hospital and the availability of NA.

The effects of NA use can be observed through the impact on the mother, the fetus, and on the course and experience of childbirth. The patients are completely or partially relieved of pain, the first period of labor is shorter, but the second is often longer, and is often followed by the Kristeller maneuver, vacuum extraction, or forceps. Application of the Kristeller maneuver is not

**Table I.** Demographic and clinical characteristics in relation to nationality.

| | Serbian women | | Romani women | | p |
|---|---|---|---|---|---|
| Age at the time of labor | 29.38±5.60 | | 23.94±6.44 | | < 0.001 |
| Number of marriages | Number | % | Number | % | |
| I | 95 | 96.0 | 26 | 81.3 | 0.042 |
| II | 3 | 3.0 | 4 | 12.5 | |
| III | 1 | 1.0 | 2 | 6.3 | |
| Age at the time of menarche | 13.12±1.62 | | 12.36±1.51 | | 0.018 |
| Painful menstrual cycles | 49 | 49.5 | 7 | 21.9 | 0.011 |
| Age at the time of first sexual intercourse | 18.34±2.82 | | 16.30±2.65 | | < 0.001 |
| Number of sexual partners | 3.14±2.62 | | 1.44±0.88 | | < 0.001 |
| Number of pregnancies | 1.90±1.02 | | 3.59±2.51 | | 0.001 |
| Number of childbirths | 1.71±0.84 | | 2.88±1.94 | | 0.002 |
| Number of miscarriages | 17 | 17.1 | 11 | 34.4 | 0.044 |
| Miscarriages | | | | | |
| Spontaneous miscarriages | 11 | 64.7 | 7 | 53.8 | 0.399 |
| Planned miscarriages | 6 | 35.3 | 5 | 38.5 | |
| Both spontaneous and planned miscarriages in one respondent | 0 | 0.0 | 1 | 7.7 | |
| Regular pregnancy check-ups | 99 | 100.0 | 20 | 62.5 | < 0.001 |
| Number of prenatal visits to the doctor | 10.92±4.33 | | 5.53±3.93 | | < 0.001 |
| Double Marker Test performed | | | | | |
| No | 41 | 41.4 | 8 | 25.0 | < 0.001 |
| Yes | 57 | 57.6 | 4 | 12.5 | |
| Complete lack of information regarding the test | 1 | 1.0 | 20 | 62.5 | |
| Triple Marker Test performed | | | | | |
| No | 92 | 92.9 | 11 | 34.4 | < 0.001 |
| Yes | 6 | 6.1 | 0 | 0.0 | |
| Complete lack of information regarding the test | 1 | 1.0 | 21 | 65.6 | |
| Oral Glucose Tolerance Test performed | | | | | |
| No | 32 | 32.3 | 7 | 21.9 | < 0.001 |
| Yes | 64 | 64.4 | 4 | 12.5 | |
| Complete lack of information regarding the test | 3 | 3.0 | 21 | 65.6 | |
| Fear of childbirth | | | | | |
| Yes | 61 | 61.6 | 26 | 81.3 | 0.067 |
| No | 38 | 38.4 | 6 | 18.8 | |
| Informed about NA | | | | | |
| Yes | 95 | 96.0 | 8 | 25.0 | < 0.001 |
| No | 4 | 4.0 | 24 | 5.0 | |
| Planned on using NA during labor | | | | | |
| Yes | 42 | 42.4 | 3 | 9.4 | < 0.001 |
| No | 57 | 57.6 | 29 | 90.6 | |
| Used NA during labor | | | | | |
| Yes | 38 | 38.4 | 4 | 12.5 | 0.012 |
| No | 61 | 61.6 | 28 | 87.5 | |
| Source of information on pregnancy and childbirth | | | | | |
| Medical doctor | 82 | 82.8 | 10 | 31.3 | < 0.001 |
| Mother, sister, mother in law | 60 | 60.6 | 15 | 46.9 | 0.246 |
| Internet | 58 | 58.6 | 3 | 9.4 | < 0.001 |
| Other | 26 | 26.3 | 6 | 18.8 | 0.533 |

recorded in the medical documentation, but the procedure is frequent during the prolonged phase of fetal expulsion. And the reports in the literature are similar[14-16]. Kristeller maneuver or some variant of fundal pressure is common especially in low and medium-developed countries. The use of this procedure is controversial and potentially harmful due to more frequent injury to the

**Table II.** Demographic and clinical characteristics in relation to the desire to use neuraxial analgesia.

| | Women planned to use NA | | | | *p* |
|---|---|---|---|---|---|
| | No | | Yes | | |
| Age at the time of labor | 27.73±6.45 | | 28.67±5.86 | | 0.405 |
| Number of marriages | Number | % | Number | % | |
| I | 77 | 89.5 | 44 | 97.8 | 0.047 |
| II | 7 | 8.1 | 0 | 0.0 | |
| III | 2 | 2.3 | 1 | 2.2 | |
| Age at the time of menarche | 12.86±1.67 | | 13.09±1.55 | | 0.426 |
| Painful menstrual cycles | 36 | 41.9 | 20 | 44.4 | 0.922 |
| Age at the time of first sexual intercourse | 17.89±3.24 | | 18.61±2.30 | | 0.146 |
| Number of sexual partners | 2.60±2.48 | | 2.96±2.32 | | 0.424 |
| Number of pregnancies | | | | | |
| First | 25 | 29.1 | 29 | 64.4 | < 0.001 |
| Second | 25 | 29.1 | 10 | 22.2 | |
| Third or more | 36 | 42.0 | 6 | 13,3 | |
| Number of childbirths | 2.28±1.43 | | 1.44±0.76 | | < 0.001 |
| Number of miscarriages | 25 | 29.1 | 5 | 11.1 | 0.035 |
| Spontaneous miscarriages | 13 | 52.0 | 5 | 100.0 | 0.056 |
| Planned miscarriages | 11 | 44.0 | 0 | 0.0 | |
| Both spontaneous and planned miscarriages in one respondent | 1 | 4.0 | 0 | 0.0 | |
| Number of prenatal visits to the doctor | 8.47±4.50 | | 11.78±4.70 | | < 0.001 |
| Regular pregnancy check-ups | 75 | 87.2 | 44 | 97.8 | 0.094 |
| Double Marker Test performed | | | | | |
| No | 30 | 34.9 | 19 | 42.2 | 0.017 |
| Yes | 37 | 43.0 | 24 | 53.3 | |
| Complete lack of information regarding the test | 19 | 22.1 | 2 | 4.4 | |
| Complete lack of information regarding the test | 20 | 23.3 | 2 | 4.4 | |
| Oral Glucose Tolerance Test performed | | | | | |
| No | 25 | 29.1 | 14 | 31.1 | < 0.001 |
| Yes | 38 | 44.2 | 30 | 66.7 | |
| Complete lack of information regarding the test | 23 | 26.7 | 1 | 2.2 | |
| Pregnancy counseling services used | | | | | |
| No | 66 | 76.7 | 38 | 84.4 | 0.179 |
| Yes | 11 | 12.8 | 6 | 13.3 | |
| Complete lack of information regarding it | 9 | 10.5 | 1 | 2.2 | |
| Fear of childbirth | | | | | |
| No | 30 | 34.9 | 14 | 31.1 | 0.811 |
| Yes | 56 | 65.1 | 31 | 68.9 | |
| Informed about NA | | | | | |
| No | 28 | 32.6 | 0 | 0.0 | < 0.001 |
| Yes | 58 | 67.4 | 45 | 100.0 | |
| Used NA during labor | | | | | |
| No | 85 | 98.8 | 4 | 8.9 | < 0.001 |
| Yes | 1 | 1.2 | 41 | 91.1 | |
| Age at the time of first pregnancy | 22.70±5.46 | | 26.36±4.81 | | < 0.001 |
| Information about contraception | | | | | |
| No | 26 | 30.2 | 2 | 4.4 | 0.001 |
| Yes | 60 | 69.8 | 43 | 95.6 | |
| Used contraception | | | | | |
| No | 48 | 57.8 | 20 | 44.4 | 0.051 |
| Yes | 18 | 21.7 | 19 | 42.2 | |
| Irregularly | 17 | 20.5 | 6 | 13.3 | |
| Source of information on pregnancy and childbirth | | | | | |
| Medical doctor | 56 | 65.1 | 36 | 80.0 | 0.117 |
| Mother, sister, mother-in-law | 49 | 57.0 | 26 | 57.8 | 1.000 |
| Internet | 37 | 43.0 | 24 | 53.3 | 0.348 |
| Other | 21 | 24.4 | 11 | 24.4 | 1.000 |

perineal muscles and possible amniotic fluid embolism[17,18].

In our institution, 25% of patients receive neuraxial analgesia (NA) in relation to the total number of births. However, we have observed that patients of Romani ethnicity are less likely to consent to NA even in cases of severe labor pain. Furthermore, Romani pregnant women often have inadequate information about the benefits and risks of NA. Only 25% of Romani respondents were informed about the existence and benefits of this type of anesthesia, compared to 96% of women from the Serbian ethnic group. This results in a lower likelihood of planning to use NA during childbirth. Only 9.4% of Romani pregnant women in our study planned to use NA, and 12.4% actually used it. The higher usage rate of NA (12.4%) among Romani women compared to those who planned for it (9.4%) may be explained by the proper engagement of obstetric staff, rapid dissemination of information regarding the benefits and potential complications of using NA, conducting of necessary laboratory analyses, and provision of this type of anesthesia to women who did not plan for it. By contrast, 42.4% of women of Serbian ethnicity in our study planned to use NA and 38.4% used it. These results are consistent with previous research, which has shown that about 35% of Latin American women use this type of analgesia compared to 60% of Caucasians[12].

It is notable that patients from the Romani ethnic group in our study were statistically significantly younger (23.94 years) at the time of childbirth compared to the Serbian ethnic group (29.38 years). This may also contribute to differences in attitudes and preferences toward pain relief during childbirth.

Our study has revealed that NA is significantly more frequently requested by women who are experiencing their first childbirth, are in their first marriage, and belong to the Serbian population. In addition, patients who request NA are typically older than those who are not informed, do not seek it out, and do not receive it. These patients are more likely to attend prenatal counseling centers and have greater knowledge about contraception. This finding could be explained by the fact that attending prenatal counseling centers and having knowledge about contraception may reflect a higher level of education and awareness regarding health-related issues. These patients may have received more comprehensive education about childbirth and pain management options, including NA, which may contribute to their increased likelihood of requesting it. Additionally, patients who attend prenatal counseling centers may have more regular interactions with healthcare professionals, allowing them to discuss their preferences and concerns regarding pain management during childbirth. Conversely, patients who do not attend these centers may have limited access to information about NA and may be less likely to consider it as an option.

In our study, pregnant women from both the Romani and Serbian ethnic groups utilized the resources of both public and private healthcare systems equally. Approximately 25-30% of pregnant women sought care and consultation from multiple doctors simultaneously during their current pregnancy. This highlights the importance of accessibility and availability of healthcare services for all pregnant women, regardless of their ethnic background or socioeconomic status. However, further research is needed to explore the factors that may influence the decision to seek care from multiple doctors during pregnancy.

Patients of the Romani ethnic group showed a lower level of perinatal care: fewer prenatal controls, less frequent biochemical screening tests, and less frequently performed glucose tolerance test. Romani women are statistically more likely to be multigravidas and multiparous compared to female patients of Serbian ethnicity. At the time of their first pregnancy, they are significantly younger than the respondents of Serbian ethnicity, which may contribute to the differences in the level of perinatal care. Younger age at the time of first pregnancy may be associated with lower levels of knowledge about proper prenatal care and its importance. Younger women may also be less likely to seek prenatal care due to a lack of awareness or financial constraints, resulting in overlooked possibilities for screening and monitoring of maternal and fetal health. This may contribute to the observed disparities in perinatal care among Romani women compared to Serbian women, who have a higher mean age at the time of their first pregnancy.

The average number of prenatal visits of Romani women is statistically lower than that of Serbian women, (6 *vs.* 11). A few patients attended the counseling for pregnant women in both groups (15% *vs.* 6%), whereas some of them did not even know it existed (4% *vs.* 19%).

In the available literature, we find very little data related to the quality of prenatal care among women of the Romani ethnic group. Despite the advancement and improvement of the health care

system, NA is less frequently accessible for women of minority groups[19].

Analysis of the monitored parameters related to information and the use of NA indicates an obvious disparity between the Roma and Serbian ethnic groups. Possible reasons for the observed disparity are on several levels.

At the level of prenatal protection: low quality of prenatal information, low quality of prenatal control, and poor communication between the pregnant woman and the doctor. Physicians may potentially be verbally dominant and less focused on patients from non-dominant ethnic groups. There is a small percentage of Romani ethnic group doctors and doctors who know the Romani language. The participation of Romani with an academic degree in Serbia is about 0.33%[20].

At the patient level, the reasons for the disparity in the use of NA may be due to education differences, cultural or religious beliefs, information gathered from incompetent and unreliable sources (Romani women obtain information about pregnancy and childbirth from family and friends more often than from medical workers), distrust of doctors, negative experiences with healthcare providers in the past, arrival at an advanced stage of childbirth (frequently in multiple births), which can discourage both staff and pregnant women from using it.

The patient obtains information about the birth from a gynecologist-obstetrician, friends, relatives, the media, and social networks. Pregnant women of the Serbian ethnic group ask for information from doctors as often as they look for it on the Internet.

Some obstetricians believe that members of ethnic minorities have a lower intensity of the pain[11], which is not based on published research conducted on different ethnic groups. There are no ethnic differences in pain perception[21]. There may be a difference in the patterns of expression of feelings and pain which can result in the staff's failure to recognize a pregnant woman's need for pain relief. Patients of the Roma ethnic group often cry out loud in the early stages of childbirth. There is no statistically significant difference in the presence of fear of pain, but the fear itself is present in a large number of patients in both groups. In our sample, 62% of mothers of Serbian ethnicity and 81% of mothers of the Roma ethnic group were afraid of pain.

There is evidence of discrimination against members of minority ethnic groups and especially Romani women in maternity hospitals in Europe[22]. Women of poorer economic status, women from rural areas, and often women of Roma ethnic origin have limited opportunities to establish informal relations in state maternity hospitals. This leaves them in fear that they cannot be protected from interventionism during childbirth. Romani women have a far better chance of being nationwide, nobody's and everyone's patient[23]. Modern but technocratic childbirth management in large hospitals is often criticized by the public and mothers due to the perceived disconnection between the system and medical staff from patients, as well as the patient's own detachment from her childbirth. There is a tendency of the staff to understand childbirth as a purely mechanical act, and the application of insufficiently defined maneuvers, such as the Kristeller maneuver, is not rare. These maneuvers must be better defined, both the way and conditions of application[18]. The already problematic technocratic model of childbirth is even worse for members of minorities. The Roma women tend to decline the offered epidural because of a lack of knowledge about it, so they are prone to refuse[23]. Therefore, there is a need for health literacy for the entire population, including particularly vulnerable ethnic minority groups. Health literacy enables individuals to process and understand the health information obtained and to be able to decide on a particular medical service[24].

## Conclusions

The benefits of obstetric analgesia must be available to all patients. Quality prenatal health care must include all patients in terms of quantity and quality. NA is a part of modern obstetrics but also the heritage of civilization must be available to all patients regardless of ethnicity or other differences.

### Conflict of Interest

The Authors declare that they have no conflict of interest.

### Authors' Contributions

Aleksandra Petrić: conception and design of the study, drafting the article, validation and final approval of the version of the article to be published. Radomir Živadinović: supervision. Dejan Mitić: validation and final approval of

the version of the article to be published. Predrag Vukomanović: analysis and interpretation of data. Ivana Kostić: acquisition of data, analysis and interpretation of data, drafting the article. Aleksandar Živadinović: acquisition of data, analysis and interpretation of data.

### Data Availability Statement

The datasets generated during and/or analyzed during the current study are available from the corresponding author upon reasonable request.

### Funding

This research received no funding.

### Ethics Approval

The study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Ethics Committee of the University Clinical Center Niš (decision protocol number: 35797/14).

### Informed Consent

All the patients included in the study signed informed consent prior to the procedure and agreed to the anonymous use of clinical data for research purposes.

### ORCID ID

Aleksandra Petrić: 0000-0002-4124-4576.
Radomir Živadinović: 0000-0002-8303-1085.
Dejan Mitić: 0000-0002-8497-4528.
Predrag Vukomanović: 0000-0002-6992-1380.
Ivana Kostić: 0000-0001-7737-0913.
Aleksandar Živadinović: 0000-0002-7648-7375.

## References

1) Whitburn LY, Jones LE, Davey MA, Small R. The meaning of labor pain: how the social environment and other contextual factors shape women's experiences. BMC Pregnancy Childbirth 2017; 17: 157.
2) Thomson G, Feeley C, Moran VH, Downe S, Oladapo OT. Women's experiences of pharmacological and non-pharmacological pain relief methods for labour and childbirth: a qualitative systematic review. Reprod Health 2019; 16: 71.
3) Leighton BL, Halpern SH. The effects of epidural analgesia on labor, maternal, and neonatal outcomes: a systematic review. Am J Obstet Gynecol 2002; 186: S69-S77.
4) Nanji JA, Carvalho B. Pain management during labor and vaginal birth. Best Pract Res Clin Obstet Gynaecol 2020; 67: 100-112.
5) Czech I, Fuchs P, Fuchs A, Lorek M, Tobolska-Lorek D, Drosdzol-Cop A, Sikora J. Pharmacological and Non-Pharmacological Methods of Labour Pain Relief-Establishment of Effectiveness and Comparison. Int J Environ Res Public Health 2018; 15: 2792.
6) Halls KL. Maternal satisfaction regarding anaesthetic services during childbirth. Br J Midwifery 2008; 16: 296-301.
7) Smith CA, Collins CT, Levett KM, Armour M, Dahlen HG, Tan A, Mesgarpour B. Acupuncture or acupressure for pain management during labour. Cochrane Database Syst Rev 2020; 2: CD009232.
8) Zimmermann R, Huch A, Huch R. Water birth-is it safe? J Perinat Med 1993; 21: 5-11.
9) Cluett ER, Burns E, Cuthbert A. Immersion in water during labour and birth. Cochrane Database Syst Rev 2018; 5: CD000111.
10) Yadollahi P, Khalajinia Z, Khormaei F. Cultural differences in Perception of labor pain without considering to painless Technique. J Adv Pharm Edu Res 2018; 8: 9-14.
11) Jiménez Puente A, Benítez-Parejo N, Del Diego-Salas J, Rivas-Ruiz F, Maanon Di Leo C. Ethnic differences in the use of intrapartum epidural analgesia. BMC Health Serv Res 2012; 12: 207.
12) Toledo P, Caballero JA. Racial and Ethnic Disparities in Obstetrics and Obstetric Anesthesia in the United States. Curr Anesthesiol Rep 2013; 3: 292-299.
13) Radovanovic S, Knežević A. Roma in Serbia. Census of Population, Households and Dwellings in the Republic of Serbia 2011, 2014.
14) Grant EN, Tao W, Craig M, McIntire D, Leveno K. Neuraxial analgesia effects on labor progression: facts, fallacies, uncertainties and the future. BJOG 2015; 122: 288-293.
15) Mazda Y. Labor neuraxial analgesia and clinical outcomes. J Anesth 2022; 36: 453-455.
16) Malvasi A, Zaami S, Tinelli A, Trojano G, Montanari Vergallo G, Marinelli E. Kristeller maneuvers or fundal pressure and maternal/neonatal morbidity: obstetric and judicial literature review. J Matern Fetal Neonatal Med 2019; 32: 2598-2607.
17) Youssef A, Salsi G, Cataneo I, Pacella G, Azzarone C, Paganotto MC, Krsmanovic J, Montaguti E, Cariello L, Bellussi F, Rizzo N, Pilu G. Fundal pressure in second stage of labor (Kristeller maneuver) is associated with increased risk of levator ani muscle avulsion. Ultrasound Obstet Gynecol 2019; 53: 95-100.
18) Sarkar A, Panneer Selvam S, Chawla R, Jindal S, Thakur V. Addressing the high prevalence of uterine fundal pressure in low-middle income country during vaginal delivery through a quality improvement initiative: Road to respectful maternity care. J Obstet Gynaecol Res 2023; 49: 194-200.
19) Lange EMS, Rao S, Toledo P. Racial and ethnic disparities in obstetric anesthesia. Semin Perinatol 2017; 41: 293-298.

20) Sokolovska V, Jarić I. Educational and economic status of Roma in Serbia and its regional distribution. Sociological review 2014; 48: 383-395.

21) Badreldin N, Grobman WA, Yee LM. Racial Disparities in Postpartum Pain Management. Obstet Gynecol 2019; 134: 1147-1153.

22) Watson HL, Downe S. Discrimination against childbearing Romani women in maternity care in Europe: a mixed-methods systematic review. Reprod Health 2017; 14: 1.

23) Pantović LJ. Somebodies or Nobody's Patient: The Importance of Social Positioning and Informal Relations during Childbirth in Serbia. Glasnik Etnografskog instituta SANU LXIX 2021; 69: 205-225.

24) Institute of Medicine (US) Committee on Health Literacy. Health Literacy: A Prescription to End Confusion. Washington, DC: National Academies Press, 2004.