

RESEARCH ARTICLE

Indicators of Elective and Indicative Caesarean Section at Teaching Hospitals in Mosul City

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ABSTRACT

Background: Caesarean sections are a surgical procedure used when vaginal delivery is not possible or safe, and the global rate has been increasing. Elective caesarean sections are planned for non-medical reasons and carry risks such as bleeding, infection, and organ injury. The study aimed to assess the indications for elective and indicative caesarean sections at teaching hospitals in Mosul City.

Method: A descriptive, cross-sectional study design aimed to investigate the indications for caesarean sections and women's reasons for choosing the procedure. Conducted from the 25th of February 2023 to the 1st of June 2023, a simple random sampling method selected a sample of 175 individuals from Mosul hospitals. A structured questionnaire gathered demographic data and information on caesarean section indications and preferences. The data was then analyzed using SPSS version 26.

Results: During the study period, the incidence rate for elective and indicative caesarean sections was 31.4% and 68.6%, respectively. Among the reasons for choosing a caesarean section, 9.1% preferred the painless method, 9.1% cited the baby's safety, 12.7% believed it was more satisfying, 7.3% chose it for cosmetic reasons, and 10.9% for emotional health. Interestingly, 23.6% selected caesarean section for a combination of reasons, while 1.8% feared episiotomy and chose it for preserving sexual function. Indications for planned, urgent, and emergent caesarean sections included hypertensive disorders of pregnancy (5.8%), obstructed labor (10%), and fetal distress (15%), respectively.

Conclusion: Planned caesareans were often due to previous caesareans, while urgent and emergent ones resulted from obstructed labor and fetal distress. Mothers chose caesareans for the baby's safety, emotional health, and episiotomy fear.

Recommendation: the study recommends promoting patient education on delivery options, monitoring and analyzing caesarean section trends, and investing in research to understand long-term consequences and minimize risks.

Keywords: *Caesarean sections, Elective cesarean, Indicative caesarean, Obstructed labor.*



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INTRODUCTION

A caesarean section, or C-section, is a surgical procedure used to deliver a baby when vaginal delivery is not possible or safe. The procedure involves making incisions in the mother's abdomen and uterus to remove the baby. Typically, a C-section is performed under regional anesthesia, such as an epidural or spinal block, which numbs the lower half of the body while the mother remains awake (Robertson & White, 2020).

While a C-section is generally considered safe, it does carry some risks. The procedure risks bleeding, infection, and injury to nearby organs. Mothers undergoing a C-section may also be at increased risk for complications in future pregnancies, such as placenta previa, placenta accreta, and uterine rupture (Irwind et al., 2021).

Recovery after a C-section can be longer and more difficult than vaginal delivery. Mothers may experience pain, discomfort, and limited mobility for several weeks following the procedure. They may also experience bleeding and discharge from the incision site. Mothers need to rest and avoid strenuous activity for several weeks after a C-section to allow their bodies time to heal properly (Nahar et al., 2022).

Elective caesarean section refers to a C-section planned for non-medical reasons. In other words, it is a C-section that is not necessary for the health and well-being of the mother or the baby. Elective C-sections are usually performed on maternal request or for other non-medical reasons, such as scheduling convenience or fear of labor pain (Sethi et al., 2023).

1.2 Prevalence rate:

The global caesarean section (C-section) rate has recently increased. According to the World Health Organization (WHO), the ideal rate of C-sections for any country is between 10-15%. However, many countries have rates well above this range (Althabe et al., 2006; Stanton & Holtz, 2006; Villar et al., 2006; Ye et al., 2016).

According to the Nineveh Health Directorate statistical department, the record of births and deaths in 2019, the prevalence of CS in Mosul city, including home and hospital deliveries, was (18.2%) which was slightly higher than the WHO recommended rate and this rate slightly higher than the rate of CS in 2019 statistic in Mosul city which was reported (15.9%).

According to a study conducted in Iraq by (Al-Sanjary et al., 2021), the prevalence of Caesarean section (CS) varied greatly among different governorates. The lowest rate was reported in the governorate of Al-Anbar at 14.2%, while the highest rate was reported in the governorate of Erbil at 52.9%. Compared to a similar study conducted by Alsheeha MA in Qassim, Saudi Arabia, the CS rate in Mosul city was significantly lower at 25, which constituted 55.4%. The overall rate of CS for all hospitals in Mosul city during the study period was 28.8%, which was calculated based on deliveries in hospitals. This rate was slightly higher than the

CS rate reported in 2019 but lower than that of five hospitals in Babel, Iraq, where the reported rate was 34.5%. The higher CS rate in Mosul city could be attributed to high-risk pregnancies and two or more hospital deliveries.

Indications for caesarean section:

Indications for elective C-section:

There are various indications for elective C-sections, varying depending on the healthcare provider or the hospital policies. Some common indications for elective C-sections include:

1. **Convenience:** Some women may choose a C-section because it allows them to schedule the delivery date in advance and avoid the uncertainty and unpredictability of spontaneous labor.
2. **Fear of vaginal delivery:** Some women may fear vaginal delivery due to concerns about pain, tearing, or other complications.
3. **Perceived safety:** Some women may believe that a C-section is a safer option for themselves or their baby, even if there is no medical indication.
4. **Previous traumatic birth experience:** Women who have had a traumatic or difficult vaginal birth may choose a C-section for subsequent deliveries to avoid a similar experience.
5. **Social pressure:** Some women may feel pressure from their partner, family, or cultural beliefs to have a C-section.

(Kose & Sadvhi, 2020; Nahar et al., 2022; Rosa et al., 2021; Sethi et al., 2023; Sungkar & Basrowi, 2020)

The terms "elective" and "planned" Caesarean section (C-section) are not interchangeable and have distinct meanings. Elective C-section refers to a non-medically necessary procedure planned for maternal request or scheduling convenience. In contrast, planned C-section refers to a procedure scheduled in advance for medical reasons, including cases where a previous C-section has been performed or other medical indications for C-section (Cohen et al., 2022).

Additionally, the timing of the procedure differs between the two. Elective C-sections are usually scheduled conveniently for the mother and healthcare provider, whereas planned C-sections are scheduled based on medical indications and the optimal delivery timing (Surana & Dongre, 2020).

Indications for planned C-section:

1. Previous C-section and the risk of uterine rupture, especially with a classical or T-shaped uterine scar
2. Multiple pregnancies (twins and triplets.) with complications or unfavorable presentation
3. Placenta previa (placenta covering the cervix)
4. Breech presentation (baby is positioned on feet or buttocks first)
5. Transverse lie (the baby is positioned horizontally)

6. Maternal medical conditions (e.g., heart disease, high blood pressure, or diabetes) that may pose a risk during vaginal delivery.
7. A very large baby (macrosomia) or a small pelvis increases the risk of obstructed labor.
8. Active genital herpes infection in the mother
9. HIV infection in the mother with a high viral load increases the risk of transmission to the baby
10. Previous uterine surgery, such as myomectomy (removal of fibroids) (Edelblute & Altman, 2021; Lecuyer et al., 2020; Neelam et al., 2022)

Indications for urgent C-section:

1. Failure to progress in labour (arrest of labor, inadequate cervical dilation, or descent of the fetal head)
2. Non-reassuring fetal heart rate patterns, suggesting fetal distress.
3. Cord prolapses (umbilical cord slips through the cervix before the baby)
4. Abruptio placentae (premature separation of the placenta from the uterus)
5. Vaginal bleeding of unknown origin during labor
6. Failed induction of labor
7. Unsuccessful trial of labor after a previous C-section (Idris & Menghisteab, 2022; Mazimpaka et al., 2020; SAIDIA, 2020)

Indications for emergency C-section:

1. Severe fetal distress with immediate threat to the baby's life
2. Uterine rupture (tearing of the uterus) during labor.
3. Placental abruption with severe maternal bleeding and fetal compromise
4. Prolonged umbilical cord prolapses with compromised fetal oxygenation.
5. Maternal hemorrhage or shock that is life-threatening.
6. Sudden maternal medical emergencies (e.g., eclampsia, severe preeclampsia, or amniotic fluid embolism) require immediate delivery. (Idris & Menghisteab, 2022; Mazimpaka et al., 2020; Mehrass et al., 2022; Razzaq et al., 2019; SAIDIA, 2020)

Complications of a caesarean section:

The potential complications of a cesarean section include Infection, Blood clots, Injury to the bladder or bowel, Excessive bleeding, Reaction to anesthesia, Adverse Reaction to medications, Uterine rupture, Damage to the baby, Longer recovery time, Increased risk of hysterectomy, Increased risk of stillbirth in subsequent pregnancies, Increased risk of placenta accreta in subsequent pregnancies (Abdelazim et al., 2020; Alshehri et al., 2019; Grabarz et al., 2021).

Nursing role:

Nurses must be familiar with a cesarean section's pre-operative, intra-operative, and post-operative care. Pre-operatively, nurses should

assess the patient's physical and emotional status, provide education about the procedure, and ensure that the patient is prepared for the surgery. Intra-operatively, nurses should monitor the patient's vital signs, provide emotional support, and administer medications as needed. Post-operatively, nurses should monitor the patient's vital signs, provide pain management, and assess the patient's incision site for signs of infection. Nurses should also provide emotional support and education about post-operative care (Cornelius, 2022).

Significance of the study:

The indications for Caesarean Section at teaching hospitals in Mosul city are significant. These hospitals serve as centers for training future medical professionals and must provide high-quality patient care. The appropriate use of caesarean section is crucial to ensure the safety and well-being of both the mother and the baby. By following the indications for Caesarean Section, these teaching hospitals can reduce the risk of complications during delivery, such as uterine rupture, bleeding, and fetal distress. Furthermore, using Caesarean Section in appropriate cases can reduce the risk of maternal and neonatal mortality, a significant concern in Iraq. Therefore, it is imperative that teaching hospitals in Mosul City follow the established indications for caesarean Section to provide safe and effective care to their patients and to ensure that the next generation of medical professionals is trained to do the same.

The objectives of the study:

1. To describe the demographic characteristics of the study sample.
2. To estimate elective and indicative caesarean section incidence rates during the study period at teaching hospitals in Mosul city.
3. To assess the most common indications for elective, planned, urgent, and emergency caesarean sections at teaching hospitals in Mosul city.

METHOD

Design of the study:

A descriptive, cross-sectional study design as a quantitative approach was adopted to achieve the aim of the present study during the period (from the 25th of February 2023 to the 1st of June 2023).

Sample and sampling:

A simple random sampling method was used for selecting the sample of the study from the Mosul hospitals, and a total number of (175) women divided into (96) from Al-Batool Teaching Hospital, (44) from Al-Salam Teaching Hospital, and (35) from Al-Khansa Teaching Hospital.

The setting of the study:

The data was collected from the obstetric departments in three hospitals in Mosul city (Al-

Batool Teaching Hospital, Al-Khansa Teaching Hospital, and Al-Salam Teaching Hospital). The center of Nineveh Governorate, the second most important city in Iraq, is in the northwest region of Iraq.

Data collection tools:

The data collection process involved administering a structured questionnaire through interviews. The questionnaire was comprised of four main parts, each of which examined different aspects of caesarean sections. The first part focused on the demographic characteristics of the study participants, specifically women who had undergone a caesarean section. The variables studied in this section included age, level of education, occupation, residence, parity, gravidity, and any history of infertility or abortion.

The second part of the questionnaire comprised 13 questions to explore the indications for elective caesarean section. The third and fourth parts focused on the indications for planned and urgent caesarean sections. Finally, the fifth part examined the indications for emergency caesarean sections.

The questionnaire was originally developed in English and later translated into Arabic for data collection purposes. A structured questionnaire facilitated the standardized data collection and ensured that all relevant information was captured uniformly. (Appendix-B).

Validity of the study:

To ensure the validity of the study tool, ten experts were chosen from different specialties in nursing to evaluate it. Their opinions, suggestions, and recommendations were considered in the final draft of the tool of this study (Appendix C).

Reliability of the study:

In order to assess the reliability of the tool, it was tested on a sample of participants by Cronbach's Alpha. The test results were analyzed using appropriate statistical methods to determine the degree of consistency and reliability of the tool. Cronbach's Alpha reported a reliability score of 0.80 for the tool, indicating high consistency and reliability.

Plot study:

To ensure the stability and consistency of the tool and test its reliability, a pilot study was carried out for a period extending from the 2nd of March 2023 to the 7th of March 2023. (18) Pregnant women, equivalent to 10%, were randomly selected from hospitals in Mosul to assess the internal consistency of the questionnaire.

Data collection period:

The data was collected over a period extending (from the 2nd of March 2023 to the 25th of May 2023).

Statistical analysis:

The SPSS version 26 was used to analyze the data to describe and analyze the study's findings. The statistical data were analyzed using various descriptive and inferential statistical tests. The results of these tests were used to interpret and draw inferences from the data.

RESULTS

Table 1 reveals that most of the participants have primary (32.57%) or tertiary (27.43%) education, and most of them are housewives (68.57%). Many of the participants live in urban areas (77.14%). The sample is almost evenly split between primipara (50.29%) and multipara (49.71%) women, and there is slightly more multigravida (57.14%) than primigravida (42.86%) women.

Table 2 shows that the incidence rate for elective caesarean section in this sample is 31.4%, while the incidence rate for indicative caesarean section is 68.6%.

Table 3 shows the reasons for choosing a caesarean section over a vaginal delivery. Out of the 55 respondents, 9.1% chose caesarean section because it is a painless method, and another 9.1% chose it because of the baby's safety. 12.7% of the respondents believed that caesarean section is more satisfying than spontaneous delivery, while 7.3% chose it for cosmetic reasons. Emotional health was also a factor for 10.9% of the respondents. Interestingly, 23.6% of the respondents chose caesarean section for various reasons. Only a small % of respondents, 1.8% each, feared episiotomy and chose a caesarean section to preserve sexual function.

Table 4 presents indications and frequencies of planned, urgent, and emergent caesarean sections. Among planned caesarean sections, the most common indications were hypertensive disorders of pregnancy (5.8%) and no dilation (8.3%). The most common indications for urgent caesarean sections were obstructed labor (10%) and meconium-stained liquor (4.2%). Emergent caesarean sections were performed most frequently due to fetal distress (15%) and placenta abruptio (8.3%).

Table 1. Maternal characteristics of the study sample

Variables		Mean	Standard deviation
Age		27.54	7.372
Variables		Frequency	Percentage
Level of Education	Primary	57	32.57
	Tertiary	48	27.43
	Secondary	35	20.00
	Read & write	19	10.86
	Illiterate	16	9.14
Occupation	Housewife	120	68.57
	Employed	37	21.14
	Student	18	10.29
Residence	Urban	135	77.14
	Rural	40	22.86
Parity	Primipara	88	50.29
	Multipara	87	49.71
Gravidity	Multigravida	100	57.14
	Primigravida	75	42.86
Total		175	100.0

Table 2. Incidence rates for elective and indicative caesarean section

Cesarean Section	Number of Cases	Incidence Rate
Elective	55	31.4%
Indicative	120	68.6%
Total	175	100.0%

Table 3. Reasons for choosing the elective caesarean section.

Reasons	Frequency	Percentage
Cesarean section is a painless method	5	9.1
Safety of the baby	5	9.1
Bad experience with previous vaginal delivery	1	1.8
A caesarean section is more satisfying than a spontaneous delivery	7	12.7
Wanted to repeat the caesarean section (mother's request)	3	5.5
Advice from a spouse	4	7.3
Perseveration of sexual function	1	1.8
Emotional health	6	10.9
Fear of episiotomy	1	1.8
Previous cesarean delivery	5	9.1
Cosmetics for the body	4	7.3
Over five of the reasons mentioned above.	13	23.6
Total	55	100.0

Table 4. Indication of indicative caesarean section

Indication of planned caesarean section	Frequency	Percentage
Previous caesarean section	5	4.2
Malpresentation	3	2.5
Hypertensive disorders of pregnancy	7	5.8
Fetal macrosomia	5	4.2
Multiple pregnancies	3	2.5
Previous vesicovaginal fistula repair	1	0.8
Retroviral positive pregnancy	1	0.8
Precious baby	3	2.5
No Dilation	10	8.3
Congenital anomalies	1	0.8
Cephalopelvic disproportion	4	3.3
Maternal malformation	1	0.8
A medical condition of the mother (Epilepsy)	1	0.8
Indication of urgent caesarean section	Frequency	Percentage
Meconium-stained liquor	5	4.2
Obstructed labour	12	10
Problems in FHR	4	3.3
Severe preeclampsia	3	2.5
Grade 1 or 2 Placenta Previa	1	0.8
Maternal exhaustion	8	6.7
Indication of emergent caesarean section	Frequency	Percentage
Fetal distress	18	15
Abruptio Placenta	10	8.3
Scar dehiscence	1	0.8
Card prolapses	1	0.8
Grade 3 or 4 Placenta Previa	3	2.5
Uterine rupture	2	1.7
Eclampsia	7	5.8
Total	120	100.0

DISCUSSION

An elective caesarean section is a planned procedure before the onset of labour. In teaching hospitals located in Mosul city, elective and emergency caesarean sections are performed based on the medical needs of the mother and baby. The study aimed to assess the indications for elective and indicative caesarean sections at teaching hospitals in Mosul City.

The mean age of the women was 27.54 years, with a standard deviation of 7.372 years. This aligns with many countries' typical childbearing age range (Ganchimeg et al., 2014). Age is an important factor to consider as it can influence the decision to perform a caesarean section, with older women generally at a higher risk for complications (Cleary-Goldman et al., 2005).

The level of education varied among the women, with the majority having primary (32.57%) or tertiary (27.43%) education. This distribution of educational attainment may influence the

decision-making process regarding the mode of delivery, as more educated women may have greater access to information and resources related to childbirth (Dahlke et al., 2013).

Most women were housewives (68.57%), while 21.14% were employed and 10.29% were students. Occupation can also impact the decision to undergo a caesarean section, as working women may perceive a caesarean section as a more convenient option due to the shorter recovery time and better control over delivery timing (Béhague et al., 2002).

Regarding residence, most of the women lived in urban areas (77.14%), with only 22.86% residing in rural areas. This difference in residence may influence the access to healthcare facilities and the availability of caesarean sections. Urban women may have better access to healthcare facilities offering caesarean sections, while rural women may face challenges accessing the same services (Gibbons et al., 2010).

The parity and gravidity of the women were almost evenly distributed between primipara

(50.29%) and multipara (49.71%) and between multigravida (57.14%) and primigravida (42.86%). This distribution suggests that first-time mothers and those with previous pregnancies undergo cesarean sections, highlighting the need for healthcare providers to consider each woman's medical history and obstetric profile when discussing birth options.

Elective caesarean sections are those performed based on maternal request or predetermined medical factors without an urgent or emergent indication. The incidence rate of 31.4% for elective caesarean sections in this study is relatively high, reflecting a growing trend in many countries where caesarean sections are performed upon request or for non-emergency reasons (Betran et al., 2016). This increase in elective caesarean sections may be attributed to several factors, including maternal anxiety, fear of vaginal birth, perceived convenience, and a belief in improved outcomes (Sandall et al., 2018).

On the other hand, Indicative caesarean sections are performed due to specific medical or obstetric indications, such as fetal distress, obstructed labour, or maternal complications. The incidence rate of 68.6% for indicative caesarean sections in this study suggests that most caesarean sections were performed for medically necessary reasons. This finding underscores the importance of caesarean sections as a critical intervention to ensure the safety of both the mother and the baby in complications during pregnancy or labour (Boerma et al., 2018).

The distinction between elective and indicative caesarean sections is essential for healthcare providers and policymakers, as it can inform strategies to reduce unnecessary caesarean sections and ensure that the procedure is performed only when medically indicated. Efforts to reduce the rate of elective caesarean sections may include improving patient education, addressing maternal fears and anxiety, and promoting the benefits of vaginal birth when appropriate (Miller et al., 2016).

The present study explored the reasons for choosing a caesarean section among a sample of women, as shown in the table. The most frequently reported reason was "Over five of the reasons as mentioned above" (23.6%), indicating that a combination of factors influenced the decision to have a caesarean section. This aligns with previous research suggesting that multiple factors, including personal, medical, and social aspects, contribute to the decision-making process regarding caesarean sections (Mazzoni, Althabe, Gutierrez, Gibbons, & Liu, 2011).

The second most common reason for choosing a caesarean section was "A caesarean section is more satisfying than spontaneous delivery" (12.7%). This may reflect women's perceptions of better control, predictability, and reduced pain during a caesarean section compared to vaginal delivery (Karlström, Lindgren, & Hildingsson, 2013).

"Emotional health" (10.9%) was another major reason, which could be attributed to the fear of childbirth, anxiety, or previous traumatic experiences related to childbirth (Fuglenes, Aas, Botten, Øian, & Kristiansen, 2011). Healthcare providers need to address these emotional concerns and provide appropriate support to help women make informed decisions about their mode of delivery.

"Caesarean section is a painless method" and "Safety of the baby" accounted for 9.1% of the responses. These findings are consistent with previous studies that found pain relief and perceived safety as primary motivations for choosing a caesarean section (Gamble & Creedy, 2001; Wiklund, Edman, Larsson, & Andolf, 2007). Less common reasons included advice from a spouse (7.3%), cosmetics for the body (7.3%), and fear of episiotomy (1.8%). These factors highlight the role of social and cultural influences on women's decisions regarding caesarean sections (Størksen, Garthus-Niegel, Adams, Vangen, & Eberhard-Gran, 2013).

In conclusion, this study reveals various reasons for choosing a caesarean section among women, with many reporting multiple reasons. Understanding these factors is crucial for healthcare providers to effectively support women in making informed decisions about their mode of delivery. When discussing birth options with women, it is essential to consider individual preferences, medical indications, emotional well-being, and social influences.

For planned caesarean sections, the most common indication was "No Dilation" (8.3%), followed by "Hypertensive disorders of pregnancy" (5.8%) and "Previous caesarean section" (4.2%). These findings are consistent with previous research, which has identified these factors as common reasons for elective caesarean sections (Mazzoni et al., 2011; Karlström et al., 2013). Healthcare providers should be aware of these indications and consider them when discussing birth options with pregnant women.

In the case of urgent caesarean sections, the most common indication was "Obstructed labour" (10%), followed by "Maternal exhaustion" (6.7%) and "Meconium-stained liquor" (4.2%). These findings highlight the importance of continuous monitoring during labour to identify and address potential complications. Healthcare providers should be prepared to manage such complications and make timely decisions regarding the need for a caesarean section (Spong, Berghella, Wenstrom, Mercer, & Saade, 2012).

Emergent caesarean sections were most commonly indicated due to "Fetal distress" (15%), followed by "Abruptio Placenta" (8.3%) and "Eclampsia" (5.8%). These are serious complications that require immediate intervention to ensure the safety of both the mother and the baby. The high prevalence of these indications underscores the importance of skilled healthcare providers and well-equipped facilities for

managing high-risk pregnancies and emergencies (Villar et al., 2007).

CONCLUSIONS

The study concluded that the most common indication for a planned caesarean section was a previous caesarean section, followed by hypertensive disorders of pregnancy and fetal macrosomia. In contrast, the most common indication for an urgent caesarean section was obstructed labour, followed by fetal distress and maternal exhaustion. For emergent caesarean sections, fetal distress was the most common indication, followed by abruptio placenta and eclampsia. The study also shed light on the reasons why some mothers choose to have a caesarean section. The reasons vary and include the safety of the baby, emotional health, and fear of episiotomy, among others.

Based on the study conclusions, the study recommends that healthcare providers should promote patient education on the benefits and risks of both vaginal and caesarean deliveries, addressing misconceptions and fears to help women make informed decisions about their preferred mode of delivery, hospitals and healthcare facilities should establish guidelines and protocols to ensure that caesarean sections are performed only when medically necessary, reducing the number of elective caesarean sections that may not have clear clinical indications, continue to monitor and analyze the incidence and indications of caesarean sections on a local, national, and global level to identify trends and areas for improvement in maternity care, and invest in research to understand better the long-term consequences of caesarean sections on maternal and child health, as well as to develop strategies to minimize the risks associated with this surgical intervention.

Ethical Approval Statement

This research study, titled " **Indicators of Elective and Indicative Cesarean Section at Teaching Hospitals in Mosul City**" conducted by [Abdulrahman Mazin Hashim], has received ethical approval from the [ethical committee the nursing college] at [University of Mosul] and [Ethical Committee of Nineveh Health Directorate] at [Nineveh Health Directorate].

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AUTHOR'S CONTRIBUTIONS

All authors contributed equally to the conception and design of the study, data collection, and analysis, and drafted the initial manuscript. All authors critically reviewed and edited the manuscript. All authors approved the final version of the manuscript for submission.

DISCLOSURE STATEMENT:

The authors report no conflict of interest.

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