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Understanding the maternal contributors to caesarean section rates: A hospital based study in Makassar, Indonesia

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Original Article

ABSTRACT

Background: Caesarean section (CS) is a surgical procedure performed when vaginal delivery is not possible due to medical or non-medical indications. The increasing prevalence of CS worldwide has raised concerns regarding maternal and neonatal health.

Objectives: This study aims to identify maternal factors contributing to the increased incidence of CS at Sitti Khadijah 1 Maternity Hospital, Makassar, for the period of January 1 – December 31, 2023. This research provides a unique contribution by analyzing CS prevalence and risk factors in a private Islamic maternity hospital, a setting underrepresented in national data. Furthermore, quantitative evaluation using multivariate analysis was conducted to determine the most dominant risk factors, supporting evidence-based prioritization in clinical decision-making and antenatal care planning in similar urban Indonesian contexts.

Methods: A cross-sectional study was conducted using secondary data from medical records of mothers who delivered at Sitti Khadijah 1 Maternity Hospital in 2023. Maternal age, history of CS, premature rupture of membranes (PROM), gestational age, and preeclampsia were analyzed. Statistical tests included Chi-Square and multivariate analysis.

Results: Of 341 deliveries, 300 (88.0%) were CS cases. Significant associations were found between CS and history of CS (p=0.004), preeclampsia (p=0.000), and PROM (p=0.000), while maternal age (p=0.751) and gestational age (p=0.183) were not significant. Mothers with a previous CS had a 99.0% likelihood of undergoing repeat CS. Preeclampsia strongly predicted CS, with 94.8% of cases delivered surgically. PROM was also a determinant, with 96.3% undergoing CS. Multivariate analysis confirmed history of CS as the strongest predictor (OR=19.689; 95% CI 2.589–149.737; p=0.004).

Conclusion: History of CS, preeclampsia, and PROM are significant factors associated with CS. The risk of CS is significantly associated highest with history of CS. These findings highlight the need for improved maternal healthcare strategies to manage high-risk pregnancies and reduce unnecessary CS procedures.

INTRODUCTION

Caesarean section (CS) is an essential obstetric intervention to ensure maternal and neonatal safety in cases where vaginal delivery poses risks. he World Health Organization (WHO) recommends an optimal CS rate of 10–15% to balance the benefits and risks.[1] However, the global prevalence continues to rise, with projections estimating a 29% rate worldwide by 2030, and in some countries potentially reaching 50% in specific populations like Indonesia.[1,2] In Indonesia, the CS rate has reached 25.9%, exceeding WHO recommendations and raising concerns regarding its indications and potential risks.[2]

Various factors contribute to this rise, including maternal medical conditions, hospital policies, and patient preferences. For numerous women globally, the fear of pain during childbirth

is becoming increasingly prevalent, resulting in a growing preference for caesarean deliveries even when there are no medical indications.[3,4] This demand for a caesarean section can create an ethical dilemma for healthcare professionals, as they must navigate the responsibility of promoting the safest method of delivery—typically vaginal birth without medical necessity—while also respecting their patients choices.[4]

While CS is a life-saving procedure in cases of obstetric emergencies, its excessive and sometimes unnecessary use may lead to higher risks of maternal morbidity, postpartum complications, and increased healthcare costs. Studies have shown that a significant proportion of CS procedures are performed without absolute medical indications, highlighting the need for further investigation into the risk factors influencing CS decisions.[4,5] Previous studies have identified several maternal factors influencing CS, including advanced maternal age, previous CS, premature rupture of membranes (PROM), preeclampsia, and fetal distress.[6,7]

The practice of caesarean sections raises the risk of numerous adverse health and behavioral effects for both mothers and their children. Mothers who opted for CS in their latest pregnancies experienced a higher prevalence of headaches, hip pain after childbirth, challenges in performing daily tasks, physical complications, and breastfeeding difficulties than those who had vaginal deliveries. Additionally, children born via CS were more likely to face respiratory issues, recurring illnesses, and particular behavioral traits.[8] Similarly, obstetric complications such as premature rupture of membranes (PROM) have also been shown to increase the likelihood of caesarean delivery and pose risks of infection, prolonged labor, and neonatal complications, thereby reinforcing the impact of obstetric factors on maternal and child health outcomes.[9]

Despite extensive study, there remains limited evidence on maternal factors influencing CS in regional, faith-based maternity hospitals in Indonesia, particularly in the context of Makassar. This study addresses that gap by analyzing maternal factors associated with CS at Sitti Khadijah Maternity Hospital using multivariate logistic regression to identify the most influential predictors. The findings are expected to benefit the local healthcare system by guiding targeted antenatal counseling, risk screening, and educational strategies tailored to the sociocultural context. Moreover, it contributes to efforts in early detection and prevention of unnecessary CS caused by maternal factors, ultimately aiming to improve maternal and neonatal outcomes in urban and faith-based healthcare settings.[10]

METHODS

Study design

This study employed a cross-sectional design using secondary data from medical records of mothers who delivered at Sitti Khadijah Maternity Hospital between January 1st and December 31st, 2023. Data processing was conducted from December 26, 2024, to January 10, 2025. The dependent variable was caesarean section (CS), while the independent variables were maternal factors including maternal age, gestational age, history of CS, preeclampsia, and PROM. Potential confounding variables—such as fetal malpresentation, fetal distress, shoulder dystocia, twin pregnancy, prolonged labor, and obstructed labor—were acknowledged but excluded from the final analysis to ensure the results focused solely on maternal factors.

This study provides specific benefits for community health applications, particularly in optimizing antenatal care services. By identifying the most significant maternal risk factors associated with CS, such as previous CS history, preeclampsia, and PROM, this research supports the development of early screening tools, personalized risk counseling, and health education interventions for pregnant women. These efforts can reduce unnecessary CS procedures, improve maternal and neonatal outcomes, and promote safer, evidence-based delivery choices within the local population. Additionally, the findings may inform regional health policy by highlighting priority areas for intervention in maternal healthcare planning.

Population and sample

The study population comprised all mothers who delivered at Sitti Khadijah Maternity

Hospital during the study period. The total sample size was 341, selected through total sampling. Of these, 300 mothers underwent CS, while 41 had vaginal deliveries. The inclusion criteria were all mothers with complete medical records, while cases with missing data were excluded. Sample size determination was based on previous studies examining CS risk factors.

Data collection

Data were collected from hospital medical records, including maternal age, gestational age, history of CS, preeclampsia, and PROM. Standardized data extraction forms were used to ensure consistency. Measurements such as weight, height, and blood pressure were reported in metric units. Verification of measurement data was conducted to ensure validity the information recorded in the medical records. Blood pressure measurements are also crucial for determining whether a patient meets the criteria for preeclampsia (a maternal variable that might cause CS) or not, as the authors conducted a double-check by reviewing both systolic and diastolic blood pressure recorded in medical records.

Data analysis

Univariate analysis was performed to summarize maternal characteristics distribution. Bivariate analysis using Chi-square tests examined associations between maternal factors and CS. A significance level of $p < 0.05$ was used. For bivariate analysis, the relationship between each independent variable and CS was examined using cross-tabulation and Chi-Square test. Crude odds Ratio (OR) with 95% confidence intervals (CIs) were calculated to determine the strength of associations between maternal factors and CS. To address the condition where a patient may present with multiple maternal risk factors simultaneously, the authors analyzed each risk factor independently. If a patient had more than one maternal factor—such as a history of CS, preeclampsia, or PROM—the patient was still included in the analysis for each corresponding variable. All 341 samples were assessed and classified according to the presence or absence of each of the five maternal risk factors. This approach allowed the study to evaluate the association between each maternal factor and the likelihood of CS while recognizing that individual patients may contribute to more than one risk category. Multivariate analysis with Multiple Logistic Regression Test was conducted to determine the most influential factor associated with caesarean section after being controlled for the other variables. All statistical analyses were performed using SPSS version 29 for Windows.

Ethical statement

This study adhered to the ethical principles for medical research involving human subjects. Informed consent was waived due to the retrospective nature of the study and absence of direct patient contact. All personal identifiers were removed prior to analysis, and data access was restricted to authorized researchers. Ethical approval was obtained from the Institutional Review Board of UIN Alauddin Makassar (Reference No. E.094/KEPK/FKIK/XII/2024).

RESULTS

Table 1 presents the characteristics of the study subjects, including maternal age, gestational age, history of caesarean section (CS), preeclampsia, and premature rupture of membranes (PROM). Most mothers were within the reproductive age group of 20–35 years and delivered at term. However, there was a high prevalence of maternal risk factors that may influence delivery outcomes, such as a history of CS, preeclampsia, and PROM, with the majority of cases in these groups resulting in delivery via CS.

Table 1. Characteristics of subjects

Category	Frequency(n)	Percent(%)
Maternal age		
<20 years or >35 years	101	29.6
20 - 35 years	240	70.4
Gestational age		
<37 weeks or >42 weeks	58	17.0
37 - 42 weeks	283	83.0
CS history		
Yes	98	28.7
No	243	71.3
Preeclampsia		
Yes	154	45.2
No	187	54.8
PROM		
Yes	163	47.8
No	178	52.2
Sectio Caesarea		
Yes	300	88.0
No	41	12.0

CS: Caesarean Section; PROM: Premature Rupture of Membrane

Bivariate analysis (Table 2) showed that a history of previous CS, preeclampsia, and PROM were significantly associated with a higher likelihood of CS delivery ($p < 0.001$ for all). Maternal age and gestational age were not significantly associated with CS ($p > 0.05$). These findings suggest that clinical complications during pregnancy have a stronger influence on the decision to perform caesarean delivery than general patient background characteristics.

Table 2. Bivariate analysis results

Variable	Caesarean Section				Total		OR (95% CI)	*p-value*
	Yes		No					
	n	%	n	%	n	%		
Maternal Age								
<20 or >35 years	88	87.1	13	12.9	101	100	0.894	0.751
20 – 35 years	212	88.3	28	11.7	240	100	(0.44-1.80)	
Gestational Age								
<37 or >42 weeks	48	82.8	10	17.2	58	100	0.59	0.183
37 – 42 weeks	252	89.0	31	11.0	283	100	(0.27-1.28)	
CS History								
Yes	97	99.0	1	1.0	98	100	19.11	0.004
No	203	83.5	40	16.5	243	100	(2.58-149.73)	
Preeclampsia								
Yes	146	94.8	8	5.2	154	100	3.91	0.000
No	154	82.3	33	17.7	187	100	(5.27-12.79)	
PROM								
Yes	157	96.3	6	3.7	163	100	6.40	0.000
No	143	80.3	35	19.7	178	100	(3.50-23.12)	

CS: Caesarean Section; PROM: Premature Rupture of Membrane; CI: Confidence Interval

Table 3 Shows that after the authors get the result for all variables, a previous CS remained the strongest predictor for repeat caesarean delivery. Preeclampsia and PROM also significantly increased the odds ratio of CS, reinforcing the importance of managing high-risk conditions during pregnancy to reduce unnecessary surgical births.

Table 3. Multivariate analysis results

Variable	*p-value*	aOR	CI 95%	
			LL	UL
CS History	0.004	19.689	2.589	149.737
Preeclampsia	0.000	5.396	2.276	12.790
PROM	0.000	9.005	3.506	23.128

CI: Confidence interval; aOR; adjusted Odds ratio

The multivariate analysis revealed that a history of previous caesarean section was the strongest independent predictor of undergoing a caesarean delivery in the current pregnancy, with an aOR of 19.689. This indicates that mothers who had previously undergone a caesarean section were nearly 20 times more likely to deliver by caesarean again, compared to those without such a history. Additionally, preeclampsia and PROM were also significantly associated with increased odds of caesarean delivery, with aOR values of 5.396 and 9.005, respectively. These findings suggest that the presence of maternal complications such as preeclampsia and PROM substantially elevates the likelihood of surgical delivery. In contrast, maternal age and gestational age did not show a statistically significant association with caesarean delivery after adjusting for other variables in the model.

In the multivariate logistic regression model, categorical variables were coded using binary values, and the reference groups were clearly defined. The reference group for maternal age was 20–35 years, for gestational age was 37–42 weeks, for caesarean section history was no prior CS, for preeclampsia was the absence of preeclampsia, and for premature rupture of membranes was the absence of PROM. All adjusted odds ratios presented in the model reflect comparisons relative to these reference categories

DISCUSSION

A history of CS emerged as the strongest predictor for repeat CS in this study, consistent with global findings.[8] Our multivariate analysis (aOR: 19.689; 95% CI: 2.589–149.737; p=0.004) confirms the dominant role of previous CS in influencing delivery mode. A study found that a history of CS is the most dominant factor influencing repeat CS, further reinforcing the need for careful assessment in managing previous CS cases.[9] According to WHO recommendations, the interpregnancy interval after CS should be at least 24 months to minimize the risk of complications.[1,2] These findings also indicate that maternal awareness of the risks of pregnancy with a history of CS is quite high, as reflected by increased antenatal visits and delivery planning at health facilities.[11]

This high percentage aligns with the common obstetric principle, which is often based on concerns about uterine rupture, abnormal placentation, and other obstetric complications associated with vaginal birth after caesarean (VBAC). Although VBAC is considered a safe option for many women, its utilization remains low due to strict eligibility criteria.[3] VBAC carries the potential risk of scar dehiscence or rupture at the site of the previous uterine incision, which can be life-threatening for both the mother and the baby. Due to these risks, many obstetricians prefer repeat CS as a preventive measure to avoid severe complications such as hemorrhage, fetal distress, or maternal morbidity. Consequently, this clinical consideration significantly contributes to the high rate of repeat CS in women with a previous history of the procedure.[3,12]

Preeclampsia was strongly associated with increased CS rates (aOR: 5.396; 95% CI: 2.276–12.790; p=0.000). In our cohort, 94.8% of mothers with preeclampsia underwent CS, compared

to 82.3% without the condition. Previous studies indicated that hypertensive disorders in pregnancy often necessitate CS to prevent complications like placental insufficiency and fetal distress.[15] This finding supports prior research suggesting that preeclampsia is a strong predictor of adverse pregnancy outcomes and requires careful management to ensure maternal and fetal safety.[13,14] A previous study found that preeclampsia significantly increases the risk of a caesarean section. Their data showed that the incidence of CS in women with preeclampsia reached 68.9%, compared to 37.8% in those without preeclampsia, with a relative risk (RR) of 1.8. This risk is particularly high in specific Robson Classification groups, including nulliparous women, multiparous women without prior CS, and preterm pregnancies. These findings indicate that preeclampsia not only raises the overall likelihood of CS but also has a particularly strong impact on certain patient groups, reinforcing the importance of early identification and appropriate management of preeclampsia in obstetric care.[15]

The high rate of CS among preeclamptic mothers highlights the importance of early detection, close monitoring, and appropriate obstetric management to prevent adverse outcomes. Strengthening ANC programs, improving blood pressure control, and ensuring timely medical intervention for high-risk pregnancy factors such as anemia or high blood pressure could help reduce emergency CS cases associated with preeclampsia.[16,17]

PROM is one of the main causes of birth complications in Indonesia. Based on IDHS 2017 data, it occurs in 16.1% of deliveries and contributes to neonatal death due to infection and sepsis.[17] This study confirmed a strong association between preeclampsia and the likelihood of CS with aOR = 9.005 (95% CI: 3.506 – 23.128; p=0.000), supporting previous research findings. PROM, defined as the rupture of the amniotic sac before the onset of labor, is a critical obstetric condition that increases the risk of infection, fetal distress, and umbilical cord prolapse, leading to a higher rate of CS. In cases of prolonged PROM, the risk of infection can increase up to tenfold, and the likelihood of neonatal sepsis reaches 8.7%. This makes CS a logical choice, particularly in cases where the latent period exceeds 24 hours or when fetal conditions deteriorate.[9,12]

Previous studies have reported similar findings, where PROM is associated with an increased risk of emergency CS to prevent complications. [18,19] Another study also found that PROM is a risk factor for neonatal asphyxia, with mothers experiencing PROM for more than 12 hours being 3.872 times more likely to give birth to babies with asphyxia.[19] The study supports the view that PROM, although not an absolute indication for CS, can be a complicating factor in pregnancy that influences the decision to perform the procedure. Similar results were reported in prior studies, indicating that age alone is not a strong determinant of CS unless combined with other medical risk factors.[20] Therefore, these findings highlight the importance of proper management of PROM cases to minimize risks and ensure optimal delivery outcomes.[21]

While maternal age and gestational age have been considered risk factors for CS, this study found no significant relationship. The study results indicate that the decision to perform a CS is more influenced by medical factors, such as obstetric history, pregnancy complications, and fetal distress, rather than maternal age itself. Therefore, although there is variation in maternal age, these clinical factors play a more dominant role in determining the mode of delivery. Additionally, the majority of the study sample consisted of mothers within a relatively homogeneous age group, with most being in the healthy reproductive age range (20– 35 years). 87.4% of CS cases occurred in women aged 20–35 years, but no significant association was found between advanced maternal age (>35 years) and CS rates.[22,23] However, research found that maternal age over 35 years is associated with increased pregnancy complications, which may indirectly increase the likelihood of CS, though the effect was not significant in our study population.

Gestational age alone may not significantly influence CS rates, but when combined with factors like previous CS or labor induction, the likelihood of CS increases. Mothers with a prior CS and gestational age ≥37 weeks had a 97.06% CS rate, while multiparous women without a CS history had an 80.95% CS rate, particularly when induction was involved. Preterm deliveries (<37 weeks) also showed a higher CS risk due to complications like fetal distress.[23,24]

From the perspective of Islamic law, CS is permitted if there are clear medical indications to avoid risks to the mother and baby. However, CS performed without medical reasons simply because of the patient's wishes or other factors that are not based on medical needs is considered not by which prioritize the health of the mother and baby.[25] CS that performed simply because of personal preference without medical reasons received serious attention from the ulama. Most schools of thought in Islam, including Hanafi, Maliki, Shafi'i, and Hanbali, agree that CS may be performed if medically necessary but is not recommended if performed without clear indications. The main principle in Islam is to protect the life and health of mothers and babies, which is in line with *maqashid sharia*, namely *hifdz an-nafs* (protecting the soul).[26]

Based on these multivariate analysis findings history of CS is the strongest predictor of repeat CS, followed by preeclampsia and PROM. Therefore, maternal health policies should focus on strategies to reduce unnecessary CS procedures, particularly through education on VBAC and improved management of high-risk pregnancies. The increasing CS rate also calls for targeted interventions to improve maternal health services, including proper prenatal screening, patient education, and timely medical interventions. Research emphasizes the importance of proper maternal healthcare in preventing unnecessary CS, which aligns with the findings of this study. CS without medical indications increases the risk of complications up to 3-5 times higher than normal delivery while the majority of women who underwent CS in previous study were mothers aged 25–35 years, in the third trimester of pregnancy, with parity of 1, a history of one previous CS due to medical indications, an interpregnancy interval of ≥3 years, and no history of vaginal delivery.[27,28]

Another critical aspect influencing the increasing rate of CS is the role of maternal request without medical indication. The global rise in elective CS due to maternal preference is often driven by fear of labor pain, past traumatic experiences, and misconceptions about its safety. Studies have shown that psychological counseling or intervention and patient education regarding the risks and benefits of different delivery methods may help in reducing unnecessary CS procedures by improving maternal emotional well-being.[29]

Our study focused primarily on maternal factors such as age, gestational age, history of CS, preeclampsia, and PROM. Other important causes of CS, such as fetal distress, malpresentation, twin pregnancy, shoulder dystocia, and obstructed labor, were not included in the main analysis, although they may have influenced clinical decision-making. Future research should incorporate these variables to provide a more comprehensive picture of CS determinants, although they may influence clinical decision making. These findings provide an evidence base for healthcare policy-making to reduce unnecessary CS and promote safer deliveries.

Some patients presented more than one or two maternal factors simultaneously. In this study, the risk factor was analyzed independently, which means that a single patient could be counted under multiple risk categories. This approach allows for a clearer understanding of the contribution of each variable but may introduce overlapping effects that were not controlled in bivariate analysis. In this study, the main reason for performing a CS was not isolated when multiple factors were present in the same patient. It was difficult to see the individual effect of risk factors that often occur together, which may affect the interpretation of causality. Future studies are recommended to use grouping or prioritization of indications so that each risk factor influence can be analyzed clearly.

CONCLUSION

Our study found that among various maternal factors examined, a history of caesarean section, preeclampsia, and premature rupture of membranes were significantly associated with an increased likelihood of caesarean delivery, while maternal age and gestational age did not show a significant relationship. These findings suggest that clinical complications during pregnancy play a more decisive role in determining the mode of delivery than demographic characteristics. Given the exclusion of fetal and delivery-related causes from the analysis, future research should aim to incorporate a broader range of maternal, fetal, and institutional factors, as well as assess how multiple simultaneous indications contribute to CS decisions. In addition, it

would be beneficial to explore the influence of non-medical variables such as maternal preference and healthcare provider recommendations to gain a more comprehensive understanding of the factors contributing to the increasing CS trend.

CONFLICT OF INTEREST

All authors declare that there is no conflict of interest in this study.

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DATA AVAILABILITY

Data is available upon request from the corresponding author.

SUPPLEMENTAL DATA

No additional supplemental data are provided for this study. All relevant data supporting the findings of this research are included within the main article. Additional information is available from the corresponding author upon reasonable request.

AUTHORS CONTRIBUTIONS

RSAP and PY initiated the study, formulated the research objectives, coordinated the overall study process, and significantly contributed to data interpretation and manuscript writing. RR was actively involved in refining the methodology, supervising the recruitment and data collection phases, and contributed to the data analysis and revision of the manuscript. RF and AS participated in organizing and analyzing the data, provided expert input on the theoretical framework, guided the interpretation of complex findings, and conducted a thorough critical review to enhance the clarity and academic rigor of the manuscript. All authors have read and agreed to the published version of the manuscript.

DECLARATION OF USING AI IN THE WRITING PROCESS

The authors acknowledge the use of AI-assisted tools in formatting and language refinement of this manuscript. However, the conceptualization, data collection, analysis, and interpretation of findings were conducted solely by the researchers.

LIST OF ABBREVIATIONS

CS: Caesarean Section; PROM: Premature Rupture of Membranes; WHO: World Health Organization, VD: Vaginal Delivery; CI: Confidence interval; OR; Odds ratio

REFERENCES

1. Jiang H, Lu C, Zhou J, Zhang W. Cesarean section and pregnancy outcomes of preterm premature rupture of membranes under different fertility policies in China. Transl Pediatr. 2021;10(4):973-83. doi:10.21037/tp-21-144. Available from: https://doi.org/10.21037/tp-21-144
2. Riskesdas. Survei Kesehatan Indonesia (SKI) 2023. Proporsi metode persalinan pada perempuan umur 10-54 tahun menurut provinsi, SKI 2023. Proporsi gangguan/komplikasi persalinan pada perempuan umur 10-54 tahun menurut provinsi, SKI 2023. Jakarta: Kementerian Kesehatan Republik Indonesia; 2023. p. 589-597.
3. Matussayyidati I, Agami S, Irsam M, Fuad W. Analisis faktor usia ibu, interval persalinan, berat bayi lahir, dan indikasi sectio caesarea sebelumnya yang mempengaruhi keberhasilan VBAC (Vaginal Birth After Caesar). J Ilmu Kedokteran dan Kesehatan. 2023;10(12). Available from: http://ejurnalmalahayati.ac.id/index.php/kesehatan

4. Colomar M, Opiyo N, Kingdon C, Long Q, Nion S, Bohren MA, et al. Do women prefer caesarean sections? A qualitative evidence synthesis of their views and experiences. Ortiz-Panozo E, editor. PLOS ONE. 2021; 16: e0251072. https://doi.org/10.1371/journal.pone.0251072
5. Schantz C, Lhotte M, Pantelias A-C. Dépasser les tensions éthiques devant les demandes maternelles de césarienne. Santé Publique. 2021;32:497–505. https://doi.org/10.3917/spub.205.0497.
6. Suleman D, Setiawati D, Gama A, Nurdin A, Damis R. Analisis hubungan preeklampsia eklampsia gravidarum dengan kejadian persalinan prematur pada ibu bersalin di RSUD Prof. Dr. Aloei Saboe periode Januari-September tahun 2020. Kedokteran. 2021;6(2). Available from: http://dx.doi.org/10.36679/kedokteran.v6i2.340
7. Alfatihah RI, Rahim R, Yunus P. Relationship of preeclampsia history of pregnant women with the incidence of neonatal asphyxia. MPPKI. 2024;7(8). Available from: https://doi.org/10.56338/mppki.v7i8.5780
8. Rahman M, Khan N, Rahman A, Alam M, Khan A. Long-term effects of caesarean delivery on health and behavioural outcomes of the mother and child in Bangladesh. J Health Popul Nutr. 2022;41(45). doi:10.1186/s41043-022-00326-6
9. Oetami S, Ambarwati D. Gambaran kejadian ketuban pecah dini pada ibu bersalin di Rumah Sakit Umum Banyumas. J Bina Cipta Husada. 2023;XIX. Available from: https://jurnal.stikesbch.ac.id/index.php/jurnal/article/view/103/139
10. Husada P, Prihartini AR, Iryadi R. Faktor-faktor yang mempengaruhi persalinan dengan tindakan sectio caesarea (SC) pada ibu bersalin. J Kesehatan Pertiwi. 2019;1. Available from: https://journals.poltekesbph.ac.id/index.php/pertiwi/article/view/4
11. Yunitasari E, Matos F, Zulkarnain H, Kumalasari DI, Kusumaningrum T, Putri TE, Yusuf A, Astuti NP. Pregnant woman awareness of obstetric danger signs in developing country: systematic review. BMC Pregnancy Childbirth. 2023;23:357. https://doi:10.1186/s12884-023-05674-7.
12. Anggraeni N, Asriani, Ramadhani R. Hubungan antara durasi ketuban pecah dini dengan APGAR skor neonatus. UMI Med J. 2020;5(2). Available from: https://doi.org/10.33096/umj.v5i2.117
13. Suciawati A, Carolin BT, Fakultas NP, Kesehatan I. Faktor-faktor yang berhubungan dengan keputusan sectio caesarea pada ibu bersalin. 2023. Available from: http://jurnal.globalhealthsciencegroup.com/index.php/JPPP
14. Sudarsih I, Agustin A. Hubungan antara komplikasi kehamilan dan riwayat persalinan terhadap Tindakan sectio caesarea. 2023. Available from: http://jurnal.globalhealthsciencegroup.com/index.php/JPPP
15. Pasokpuckdee, K., & Boriboonhirunsarn, D. (2023). Incidence of Preeclampsia and Cesarean Section Rate According to the Robson Classification. Cureus. https://doi.org/10.7759/cureus.49845
16. Kuntari, T., & Supadmi, S. (2024). Anemia in young pregnant women: A cross-sectional study in Indonesia. Jurnal Kedokteran Dan Kesehatan Indonesia, 147–161. https://doi.org/10.20885/jkki.vol15.iss2.art3
17. Anisa, N., Astuti, A. W., & Hakimi, M. (2022). Correlation between complications during delivery and neonatal mortality: Data analysis of Indonesia Demographic and Health Survey (IDHS) 2017. Jurnal Kedokteran Dan Kesehatan Indonesia, 125–138. https://doi.org/10.20885/jkki.vol13.iss2.art5
18. Jiang H, Lu C, Zhou J, Zhang W. Cesarean section and pregnancy outcomes of preterm premature rupture of membranes under different fertility policies in China. Transl Pediatr. 2021;10(4):973-83. Available from: https://doi.org/10.21037/tp-21-144
19. Young C, Bhattacharya S, Woolner A, Ingram A, Smith N, Raja EA, et al. Maternal and perinatal outcomes of prolonged second stage of labour: a historical cohort study of over 51,000

women. BMC Pregnancy Childbirth. 2023;23(1). Available from: https://doi.org/10.1186/s12884-023-05733-z

20. Singh N, Pradeep Y, Jauhari S. Indications and determinants of cesarean section: A crosssectional study. Int J Appl Basic Med Res. 2020;10(4):280. Available from: https://doi.org/10.4103/ijabmr.ijabmr_3_20
21. Nurdin A, Nurdin H, Sari M. Analysis of the relationship between premature rupture of membranes with delivery method and newborn asphyxia. Int J Reprod Contracept Obstet Gynecol. 2021;10(12):4377. https://doi.org/10.18203/23201770.ijrcog20214631
22. Tang W, Zeng D, Wu W, Wu S, Ou Y, Huang Y, Xiao L, Huang S, Li Z. How two-child policy affects cesarean section in women with advanced maternal age (AMA): using the Robson classification system. BMC Pregnancy Childbirth. 2024;24(1):242. https://doi.org/10.1186/s12884-024-06784-6
23. Nurhayati FN, Prasetyo B, Miftahussurur M. Analysis of caesarean section rates and source of payment using the Robson classification system. J Matern Child Health. 2023;8(1):1–11. https://doi.org/10.26911/thejmch.2023.08.01.01
24. Sakunti SS, Fitriani R, Jalaluddin S, Tihardimanto A. Analisis faktor risiko asfiksia neonatorum di Rumah Sakit Labuang Baji, Makassar, 2021. Alami J Alauddin Islamic Med J. 2024;8(2):6373-6381. https://doi.org/10.24252/alami.v8i2.36692
25. Fachrudin F, Hidayah Bogor A, Tetap Prodi Ahwal As-Syakhsiyah STAI Al Hidayah Bogor D. Analisis rekayasa kelahiran melalui operasi caesar dalam perspektif hukum Islam. ProsA AS: Prosiding Al Hidayah Ahwal Asy-Syakhshiyah. 2019;1(1). Available from: https://jurnal.staalhidayahbogor.ac.id/index.php/pas/article/view/346
26. Beddu, M. J., Yanti, N., Noviyanti, Aslina, N., & Daud, N. (2024). Caesarean Section in the Perspective of Family, Health, and Islamic Law. Al-Istinbath: Jurnal Hukum Islam, 9(1), 359–374. Available from: https://doi.org/10.29240/jhi.v9i1.8373
27. Dewi R, Sari P, Trijayanthi Utama W, Wahyunindita RN. Morbidity and mortality factors analysis of caesarean section. Indones J Glob Health Res. 2021;3(3):269-276. https://doi.org/10.37287/ijghr.v3i3.563
28. Grace DA, Wantania JJE, Wagey FMM. Profile of pregnant women with previous cesarean section during COVID-19 pandemic. E-CliniC. 2022;10(2):242-249. https://doi.org/10.35790/ecl.v10i2.38124
29. Xu L, Fang L, Xu Q, Shen D. Study on the effect of intervention on postpartum psychological improvement and body recovery of caesarean section women based on information-motivation-behavioural skills model. Nurs Open. 2023;10(7):4705-4712. https://doi.org/10.1002/nop2.1720