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MATERNAL AND FETAL DETERMINANTS OF CAESAREAN SECTION DELIVERY

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ABSTRACT
Maternal, infant, and toddler mortality rates remain a serious public health problem in Indonesia. One effort to reduce these rates is by ensuring safe delivery services, both vaginally and through cesarean sections (CS). Although normal delivery is preferred, the trend of cesarean sections has continued to increase in recent decades. Sultan Iskandar Muda Regional Hospital, as a type C hospital in Nagan Raya Regency, Aceh, records an increase in childbirth cases every year. This study aims to analyze the determinants that influence cesarean section procedures at the hospital. This study uses an explanatory sequential design. This type of quantitative research with a cross-sectional design was conducted using patient medical records. The population is all data on mothers who gave birth by cesarean section at Sultan Iskandar Muda Regional Hospital, taken within a 3-month period, namely October - December 2024, a total of 324 mothers giving birth by cesarean section. The sampling method used the total population with a sample size of 324 respondents. While qualitative research with a phenomenological approach, conducted by interview using interview guidelines, the method of collecting informants using purposive sampling with a total of 7 informants. The results of quantitative research show that the most dominant relationship between cesarean section is prolonged labor (OR: 701.40; 95%CI: 98.02-5019.20; p value: 0.0001), the occurrence of PEB (OR=446.33; 95%CI=21.62-9214.06; p=0.0001) and term birth (OR=35.76; 95%CI=0.29-4446.35; p=0.146) at Sultan Iskandar Muda Regional Hospital, Nagan Raya Regency. The results of qualitative research show that non-medical factors that play a role in cesarean section are fear of pain and complications during normal delivery. Prolonged labor is the most dominant factor with cesarean section. Therefore, health workers at community health centers are expected to provide positive support in the form of positive affirmations to pregnant women, such as deep breathing and relaxation exercises to reduce pain. Strengthen education programs and routine pregnancy check-ups at primary health care facilities to detect risk factors early and prevent childbirth complications.

Keywords: fetal weight; labor; prolonged labor; sectio caesarea; severe preeclampsia

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INTRODUCTION

Maternal, infant, and toddler mortality rates remain a significant health problem in Indonesia, remaining relatively high. The health development target to be achieved by 2025 is to improve public health, with a reduction in maternal, infant, and toddler mortality rates, among other indicators. The target is to reduce the maternal mortality rate from 359 per 100,000 live births to 306 per 100,000 live births (Kemenkes, 2015). One effort to reduce maternal mortality is to save mothers through safe deliveries. Childbirth is the process of delivering a baby. This can be done vaginally or through a cesarean section (CS). The term "cesarean section" comes from Latin, meaning to cut or to cut. In obstetrics, the term refers to a surgical procedure that aims to deliver a baby by opening the mother's abdominal wall and uterus (Daniyati & Mawaddah, 2021).

The rapid development of cesarean section technology has significantly reduced the risk of childbirth. Therefore, cesarean section delivery is performed with the goal of ensuring a well-born baby and a healthy mother. WHO data from 2014 showed that the number of cesarean deliveries in

developed countries increased by 110,000 per 100,000 live births. Caesarean section deliveries have increased over the past three decades, exceeding optimal estimates. The increase has doubled, most recently by 21%, and is increasing by 4% annually. In Latin America, the cesarean section rate has increased by nearly 60%. Currently, cesarean section rates range from 10 to 40 percent of all deliveries, as cesarean delivery is one of the efforts to reduce maternal and infant mortality (Nagy & Papp, 2020; Visconti et al., 2020). Based on data from Riskesdas (2023), the overall normal birth rate was 81.5%, while cesarean section accounted for 19.3% of all births. Normal delivery remains the primary option, but cesarean section (CS) is an alternative if normal delivery is not possible, either due to medical reasons such as preeclampsia or non-medical reasons such as a desire to avoid pain or discomfort (Daniyati & Mawaddah, 2021).

CSs are usually performed when vaginal delivery is not possible or poses high risks to the mother and baby. However, in recent decades, the number of CSs has increased not only for medical reasons but also for non-medical reasons. These non-medical factors include the mother's desire to avoid labor pain, concerns about vaginal damage, or aesthetic reasons such as maintaining body shape. Some mothers also feel more comfortable with a scheduled delivery (Sukasih et al., 2020). Based on the level of urgency, cesarean sections can be divided into elective (planned) and emergency (cito) sections, which will determine when the procedure must be performed. An elective cesarean section is a cesarean section that is planned before labor begins and is performed according to medical indications such as cephalopelvic disproportion (CPD), fetal malposition, placenta previa, and complications for both the mother and the fetus. Meanwhile, an emergency cesarean section is a cesarean section that must be performed immediately after the diagnosis is made if labor is obstructed and fetal and maternal distress occurs that can be life-threatening (Horgan et al., 2023).

Cesarean sections carry intra-operative and post-operative risks, such as potential severe bleeding, infection, slower recovery time after delivery, delayed breastfeeding and skin-to-skin contact, and increased potential complications in subsequent pregnancies. Complications and side effects following a cesarean section significantly impact the mother's recovery process. Therefore, efforts to improve maternal and child health are a priority for national development goals in the health sector (Tambuwun et al., 2023). Nagan Raya Regency, Aceh Province, and Nagan Raya Regency are adjacent to West Aceh Regency. Sultan Iskandar Muda Regional Hospital, Nagan Raya, is a type C regional hospital located in Nagan Raya Regency, Aceh Province. In a preliminary study, the number of childbirth cases has increased from year to year. The number of births recorded in Nagan Raya Regency in 2023 was 3,138 mothers giving birth, both in hospitals and other health facilities, either by CS or vaginal delivery. Then, the prevalence of births by CS compared to vaginal delivery in 2023 was 50.7% (1,591 patients) of total births (Profil RSUD Sultan Iskandar Muda Kabupaten Nagan Raya, 2023). The high CS rate in this region indicates that various factors, including reasons, influence the choice of delivery. This study aims to analyze the determinants that influence the choice of delivery, both normal and CS.

METHOD

This is a mixed-methods study combining quantitative and qualitative approaches. The quantitative approach used a cross-sectional design, while the qualitative approach employed a phenomenological approach to explore non-medical factors influencing the decision to have a cesarean section. Quantitative data collection was conducted using secondary data sourced from the medical records of mothers giving birth at Sultan Iskandar Muda Regional Hospital, Nagan Raya Regency. Data were collected retrospectively for the period from October to December 2024. The data collection process was carried out by tracing and recording relevant information from medical record documents using a structured checklist prepared by the researcher. The variables collected included maternal characteristics (age, education, occupation, parity, height and weight, pregnancy spacing), obstetric factors (history of previous labor, prolonged labor, severe preeclampsia,

antepartum hemorrhage, CPD), and fetal factors (birth weight, fetal distress, prematurity, placenta previa, and fetal abnormalities). All incomplete or illegible data were excluded from the analysis process.

The quantitative research population was all mothers who gave birth by cesarean section at Sultan Iskandar Muda Regional Hospital during the study period, with a total of 324 cases, and the entire population was used as a sample (total sampling). The collected data were then coded, entered, and analyzed using logistic regression tests to identify factors associated with the incidence of cesarean sections. Qualitative data collection was conducted through in-depth interviews with seven informants selected using purposive sampling, consisting of mothers giving birth and health workers directly involved in delivery services. Interviews were conducted using a semi-structured interview guide, focusing on experiences, perceptions, and non-medical reasons for choosing a cesarean section, such as fear of pain and complications of vaginal delivery. All interviews were audio-recorded, transcribed verbatim, and then analyzed thematically to strengthen and complement the quantitative findings.

RESULT

Table 1.
Frequency distribution of respondents' demographic characteristics, maternal factors, fetal factors and caesarean section

Variables	f	%
Mother's Job		
Work	85	26,23
Not working	239	73,77
Maternal Education		
Low	29	8,95
Middle	268	82,72
High	27	8,33
Cesarean Section		
Emergency CS	67	20,68
Elective CS	257	79,32
Parity		
Grande multipara (>5 times)	20	6,17
Multipara (2-5 times)	201	62,04
Primipara (1 time)	103	31,79
Indications for prolonged labor		
Yes	72	22,22
No	252	77,78
Cephalopephalal disproportion		
Yes	13	4,01
No	311	95,99
Threatened uterine rupture		
Uterine rupture occurred	9	2,78
Uterine rupture did not occur	315	97,22
Antepartum hemorrhage		
Bleeding occurred	27	8,33
No bleeding occurred	297	91,67
Previous birth history		
Cesarean Section	210	64,81
Normal	11	3,40
Never	103	31,79
Severe preeclampsia		
Severe preeclampsia	13	4,01
No Severe preeclampsia	311	95,99
Maternal age at delivery		

Variables	f	%
At risk	58	17,90
Not at risk	266	82,10
Maternal height		
At risk	4	1,23
Not at risk	320	98,77
Maternal weight		
Abnormal	81	25,00
Normal	243	75,00
Pregnancy interval		
At risk	180	55,56
Not at risk	144	44,44
Fetal distress		
Yes	65	20,06
No	259	79,94
Fetal weight		
≥ 4.000 grams	13	4,01
< 4.000 grams	311	95,99
Placenta previa		
Total placenta previa	18	5,56
Normal	306	94,44
Premature birth		
Premature	17	5,25
Not premature (term)	307	94,75
Twin pregnancy		
Twins	0	0
Not twins	324	100,0
Fetal abnormality		
An abnormality exists	19	5,86
No abnormality exists	305	94,14

Respondent characteristics showed that the majority of mothers were employed (73.77%) and had secondary education (82.72%), while 26.23% were unemployed. In terms of maternal factors, the majority of mothers underwent elective CS (79.32%), were multiparous (62.04%), and did not experience obstetric complications, such as prolonged labor (77.78%), cephalopelvic disproportion (95.99%), uterine rupture (97.22%), hemorrhage (91.67%), and severe preeclampsia (95.99%). Most mothers also had a history of previous CS (64.81%), age and height that were not at risk were 82.10% and 98.77%, respectively, normal weight (75.00%), and a non-risk pregnancy spacing, although the proportion was lower (44.44%). In terms of infant factors, most fetuses did not experience fetal distress (79.94%), had a birth weight of less than 4,000 grams (95.99%), had normal placenta previa (94.44%), were born at term (94.75%), and no cases of twin pregnancies or fetal abnormalities were found (94.14%) (Table 1).

Table 2.
Bivariate analysis of factors associated with cesarean section using logistic regression test

Variables	Caesarean Section (CS)				OR	95% CI	p-value
	Emergency CS		Elective CS				
	f	%	f	%			
Mother's Job							
Work	67	78,82	18	21,18			
Not working	0	0,00	239	100,0	1	*empty*	*empty*
Maternal Education							
Low	19	65,52	10	34,48			
Middle	38	14,18	230	85,82	11,5	4,96-26,61	0,0001
High	10	37,04	17	62,96	3,23	1,08-9,64	0,036
Parity							
Grande multipara (>5 times)	10	50,00	10	50,00			
Multipara (2-5 times)	34	16,92	167	83,08	4,91	1,90-12,71	0,001

Variables	Caesarean Section (CS)				OR	95% CI	p-value
	Emergency CS		Elective CS				
	f	%	f	%			
Primipara (1 time)	23	22,33	80	77,67	3,48	1,29-9,38	0,014
Indications for prolonged labor							
Yes	61	84,72	11	15,28			
No	6	2,38	246	97,62	227,35	80,89-639,07	0,0001
Cephalopephalal disproportion							
Yes	6	46,15	7	53,85			
No	61	19,61	250	80,39	3,51	1,14-10,83	0,029
Threatened uterine rupture							
Uterine rupture occurred	9	100,00	0	0,00			
Uterine rupture did not occur	58	18,41	257	84,26	1	*empty*	*empty*
Antepartum hemorrhage							
Bleeding occurred	27	100,00	0	0,00			
No bleeding occurred	40	13,47	257	96,25	1	*empty*	*empty*
Previous birth history							
Cesarean Section	38	18,10	172	81,90			
Normal	6	54,55	5	45,45	0,18	0,035-0,63	0,007
Never	23	22,33	80	77,67	0,77	0,43-1,37	0,375
Severe preeclampsia							
Severe preeclampsia	12	92,31	1	7,69			
No Severe preeclampsia	55	17,68	256	82,32	55,85	7,11-438,53	0,0001
Maternal age at delivery							
At risk	19	32,76	39	67,24			
Not at risk	48	18,05	218	81,95	2,21	1,18-4,16	0,014
Maternal height							
At risk	1	25,00	3	75,00			
Not at risk	66	20,63	254	79,38	1,28	0,13-12,53	0,830
Maternal weight							
Abnormal	32	39,51	49	60,49			
Normal	35	14,40	208	85,60	3,89	2,19-6,87	0,0001
Pregnancy interval							
At risk	38	21,11	142	78,89			
Not at risk	29	20,14	115	79,86	1,06	0,62-1,83	0,830
Fetal distress							
Yes	2	0,77	257	99,23			
No	65	100,00	0	0,00	1	*empty*	*empty*
Fetal weight							
≥4.000 grams	10	76,92	3	23,08			
< 4.000 grams	57	18,33	254	81,67	14,85	3,96-55,70	0,0001
Placenta previa							
Total placenta previa	8	44,44	10	55,56			
Normal	59	19,28	247	80,72	3,35	1,27-8,85	0,015
Premature birth							
Premature	16	94,12	1	5,88			
Not premature (term)	51	16,61	256	83,39	80,31	10,42-619,22	0,0001
Twin pregnancy							
Twins	0,00	0,00	0,00	0,00			
Not twins	67	20,68	257	79,32	1	*empty*	*empty*
Fetal abnormality							
An abnormality exists	9	47,37	10	52,63			
No abnormality exists	58	19,02	247	80,98	3,83	1,49-9,86	0,005

The results of the study showed that the incidence of emergency cesarean section (CS) was more common in mothers with maternal and fetal risk factors, such as low education, grand multiparity, prolonged labor, cephalopelvic disproportion, severe preeclampsia, maternal age at risk, abnormal

maternal weight, fetal distress, fetal weight ≥4,000 grams, total placenta previa, premature birth, multiple pregnancies, and fetal abnormalities. In contrast, elective CS was more dominant in mothers with secondary and higher education, multiparity and primiparity, without obstetric complications, maternal age not at risk, normal maternal weight, and stable fetal conditions such as singleton pregnancy, fetal weight <4,000 grams, normal placenta previa, and term birth. Statistically, factors such as education, parity, prolonged labor, cephalopelvic disproportion, history of childbirth, severe preeclampsia, maternal age and weight, fetal weight, placenta previa, prematurity, and fetal abnormality were significantly associated with the incidence of CS, while maternal occupation, uterine rupture, antepartum hemorrhage, maternal height, pregnancy spacing, fetal distress, and twin pregnancy did not show a significant association (Table 2).

Table 3.
Multivariate analysis of factors associated with caesarean section using multiple logistic regression test

Variables	Model 1		Model 2		Model 3	
	AOR (95% CI)	p-value	AOR (95% CI)	p-value	AOR (95% CI)	p-value
Maternal Education						
Low						
Middle	10,90 (1,45-82,21)	0,020	9,61 (3,62-25,52)	0,0001	16,05 (1,22-210,80)	0,035
High	7,16 (0,49-103,66)	0,149	3,85 (1,05-14,17)	0,042	11,84 (0,58-240,88)	0,108
Parity						
Grande multipara (>5 times)						
Multipara (2-5 times)	1,84 (0,19-17,56)	0,594			2,55 (0,18-35,79)	0,487
Primipara (1 time)	2,30 (0,20-26,88)	0,508			4,13 (0,23-74,78)	0,337
Indications for prolonged labor						
Yes						
No	314,94 (76,60-1294,92)	0,0001			701,40 (98,02-5019,20)	0,0001
Cephalopephalal disproportion						
Yes						
No	0,31 (0,04-2,56)	0,277			0,16 (0,02-1,49)	0,108
Previous birth history						
Cesarean Section						
Normal	0,20 (0,01-4,20)	0,302			0,18 (0,01-8,81)	0,387
Never	*empty*	*empty*			*empty*	*empty*
Severe preeclampsia						
Severe preeclampsia						
No Severe preeclampsia	197,38 (11,71-3325,84)	0,0001			446,33 (21,62-9214,06)	0,0001
Maternal age at delivery						
At risk						
Not at risk	1,05 (0,16-7,03)	0,961			0,39 (0,03-5,93)	0,0001
Maternal weight						
Abnormal						
Normal	3,72 (1,07-12,87)	0,038			1,87 (0,46-7,60)	0,384
Placenta previa						
Total placenta previa						
Normal			0,54 (0,05-5,68)	0,606	21,81 (0,42-1130,43)	0,126
Premature birth						
Premature						

Variables	Model 1		Model 2		Model 3	
	AOR (95% CI)	p-value	AOR (95% CI)	p-value	AOR (95% CI)	p-value
Not premature (term)			80,85 (10,06-649,49)	0,0001	35,76 (0,29-4446,35)	0,146
Fetal abnormality						
An abnormality exists						
No abnormality exists			2,14 (0,23-19,69)	0,501	0,06 (0,02-1,40)	0,081
Pseudo R2	0,7368		0,2888		0,7909	

In the maternal factors and maternal characteristics model, the indication of prolonged labor is the most dominant factor associated with the incidence of cesarean section (CS), where mothers without indication of prolonged labor have a 314 times greater chance of undergoing elective CS with a pseudo R^2 value of 0.7368 indicating a model contribution of 73.68%. In the infant factors and maternal characteristics model, preterm birth is the most dominant factor, with mothers who give birth at term having an 81 times greater chance of undergoing elective CS, and a pseudo R^2 value of 0.2888. Meanwhile, in the combined model of maternal factors, infant factors, and maternal characteristics, the indication of prolonged labor is again the strongest determinant, where mothers without indication of prolonged labor have a 701 times greater chance of undergoing elective CS, with a pseudo R^2 value of 0.7909 indicating the model's ability to explain the incidence of CS by 79.09%.

DISCUSSION

Frequency Distribution of Caesarean Section

The percentage of mothers with elective CS was 79.32%, while the percentage with emergency CS was 20.68%. This is in line with Febrianawati et al. (2024), which showed that 21.4% of patients had emergency CS.

The Relationship Between Mother's Occupation and Caesarean Section

Based on the analysis above, it shows that the number of mothers who gave birth by emergency CS was higher among working mothers (78.82%), while the number of mothers who gave birth by elective CS was higher among unemployed mothers (100.0%). The statistical test results obtained an empty value, meaning there was no relationship at all between the mother's occupation and cesarean section. These results align with Komarijah and Waroh (2023), who showed no association between maternal occupation and cesarean section. A mother's occupation is not a factor in determining a safe delivery for both mother and baby, but rather serves as a baseline characteristic of the mother about to give birth. Determining a safe and healthy delivery for the mother is not based on whether the mother is employed, but rather on symptoms that pose a high risk to the baby and mother.

The Relationship Between Maternal Education and Caesarean Section

Based on the results of the analysis above, it shows that mothers who gave birth with emergency CS were higher in low education at 65.52%, while mothers who gave birth with elective CS were higher in mothers with secondary education at 85.82%. The results of the statistical test obtained an OR value = 0.28 (0.12-0.66). This means that mothers with secondary education have a 12-fold chance of having an elective CS. The results of the statistical test obtained a p-value of 0.0001, which means there is a significant relationship between secondary education and cesarean section. The results of the statistical test obtained an OR value = 3.23. This means that mothers with higher education have a 3-fold chance of having an elective CS. The results of the statistical test obtained a p-value of 0.036, which means there is a significant relationship between higher education and cesarean section. These results align with Jusman (2023), who showed a relationship between maternal education and cesarean section rates. The researchers argue that education influences cesarean section rates because knowledge of developments can reduce maternal morbidity and

morale. Knowledge is influenced by various factors surrounding an individual, both internal and external. The results of this study are in line with research conducted by Jusman (2023), which explains that the majority of pregnant women who choose cesarean section delivery have less knowledge, as much as 52%. This is due to the educational factor of the mothers, most of whom are high school or college, so the level of knowledge of the mothers is also better because usually the higher a person's education, the better their level of knowledge.

The Relationship Between Maternal Parity and Caesarean Section

Based on the results of the analysis above, it shows that mothers who gave birth with emergency CS were higher in grand multiparous parity by 50.00%, while mothers who gave birth with elective CS were higher in multiparous parity by 83.08%. The results of the statistical test obtained an OR value of 4.91. This means that mothers with multiparous parity have a 5-fold chance of having an elective CS. The results of the statistical test obtained a p-value of 0.001, which means there is a significant relationship between multiparous parity and cesarean section. The results of the statistical test obtained an OR value of 3.48. This means that mothers with primiparous parity have a 3-fold chance of having an elective CS compared to mothers with grand multiparous parity. The results of the statistical test obtained a p-value of 0.014, which means there is a significant relationship between primiparous parity and cesarean section.

The results of this study are in line with Nurshabila and Balfas (2023), who showed that parity is associated with cesarean section. Parity is the number of births resulting in a live birth. A woman who has had three or more pregnancies has a greater risk of experiencing weak contractions during labor (Rahim & Hengky, 2020). With low parity, the mother's unpreparedness for her first birth is a contributing factor to her inability to handle complications that occur during pregnancy and childbirth (Amir, 2020). High parity mothers have lower maternal health outcomes compared to low parity mothers, thus there is a high likelihood that babies born to mothers with high parity mothers are at greater risk of experiencing illness than babies born to mothers with low parity mothers (Amir, 2020). Parity 1-3 is the safest parity in terms of postpartum hemorrhage, which can lead to maternal death. High parity (>4) has a higher incidence of postpartum hemorrhage. Meanwhile, low parity is characterized by a lack of preparedness for the first birth, a factor contributing to the inability of pregnant women to manage complications that occur during pregnancy and childbirth, leading to indications and other conditions that contribute to low parity (Yanti & Lilis, 2022).

In multiparous mothers, the uterus remains relatively well-prepared to maintain its function of contracting effectively during labor. After experiencing multiple deliveries, the uterus is still able to adapt without experiencing a significant decrease in tone and contractility. In other words, the uterine muscles are still strong enough to produce effective contractions, making labor more likely to proceed smoothly. This reduces the risk of complications during labor that could lead to the need for an emergency C-section. Furthermore, multiparous mothers generally have experienced previous births, so their bodies are better prepared for subsequent labors. Therefore, no statistically significant association was found between multiparous parity and emergency C-sections (Dashe et al., 2018).

Conversely, in mothers with grand multiparity, the risk of emergency cesarean delivery increases significantly. This is because the more deliveries a woman has, the greater the likelihood of structural changes in the uterus. Uterine muscles that have been repeatedly stretched tend to experience decreased tone and contractility. As a result, the uterus's ability to contract effectively to expel the baby is reduced. Inadequate contractions can lead to prolonged or obstructed labor, increasing the need for emergency cesarean delivery. Furthermore, changes in uterine tissue due to multiple deliveries can affect the labor process and increase the likelihood of complications, ultimately making an emergency cesarean delivery necessary (Betrán et al., 2015).

Furthermore, mothers with grand multiparity are at higher risk of experiencing labor complications due to decreased uterine elasticity. This can lead to an imbalance in the cervical dilation process and the baby's movement through the birth canal. This imbalance can potentially lead to inefficient labor, ultimately requiring medical personnel to perform an emergency cesarean section to prevent further complications. Therefore, there is a statistically significant association between grand multiparity and emergency cesarean section, as demonstrated by the significant p-value in the analysis (Febrianawati et al., 2024).

The Relationship Between Prolonged Labor and Caesarean Section

Based on the results of the analysis above, it shows that mothers who gave birth with emergency CS had a higher risk of prolonged labor indications of 84.72%, while mothers who gave birth with elective CS had a higher risk of no prolonged labor indications of 97.62%. The results of the statistical test obtained an OR value of 227.35. This means that mothers who did not have prolonged labor indications had a 227 times greater chance of having an elective CS birth. The results of the statistical test obtained a p-value of 0.0001, which means there is a significant relationship between prolonged labor indications and cesarean section. These results align with those of Dashe et al. (2018), who showed a statistically significant association between prolonged labor and the incidence of emergency CS. In other words, prolonged labor is a major risk factor contributing to the increased incidence of emergency CS.

The theory put forward by Ruqaiyah (2019), states that non-progressive labor is a latent phase lasting more than 8 hours. Labor has lasted 12 hours or more, and the baby has not yet been born. Cervical dilation to the right of the alert line indicates active labor (Widiawati, 2019). Non-progressive labor is the absence of progress in cervical dilation, or descent of the part that enters during active labor (Dila et al., 2022). Non-progressive labor is a phase of labor that is obstructed and lasts too long, causing symptoms such as dehydration, infection, fatigue, as well as asphyxia and death in the womb. A cesarean section is an artificial delivery, in which the fetus is delivered through an incision in the abdominal wall and uterine nerve wall intact and the fetus weighs more than 500 grams (Dila et al., 2022). A cesarean section is a procedure to deliver a baby weighing more than 500 grams through an incision in the uterine wall (Rizki et al., 2024).

Physiologically, prolonged labor occurs when labor lasts longer than expected, either during the latent or active phase. This condition can be caused by various factors, such as ineffective uterine contractions, an imbalance between the size of the fetus and the mother's pelvis (cephalopelvic disproportion), or an unfavorable fetal position. When labor does not progress for a long time, the risk of maternal exhaustion increases, as does the risk of fetal hypoxia due to the continuous pressure during contractions. In such circumstances, emergency cesarean section intervention is often necessary to prevent more serious complications for the mother and baby (Betrán et al., 2015). Furthermore, prolonged labor also increases the risk of intrauterine infection due to prolonged rupture of membranes without adequate labor progression. This infection can endanger the health of both mother and fetus, making emergency cesarean delivery the best solution to reduce this risk. Therefore, statistically and clinically, the association between prolonged labor and emergency cesarean delivery is very strong, as demonstrated by the analysis results, which had a very high OR and a significant p-value (Yuhana et al., 2022). According to researchers, cesarean sections are caused by several factors, one of which is non-progressive labor. Non-progressive labor is a phase of labor that is stalled and lasts too long, causing symptoms such as dehydration, infection, fatigue, asphyxia, and stillbirth. In cases of non-progressive labor, a pregnant woman is indicated for a cesarean section. This is because non-progressive labor can result in the risk of fetal death if not managed properly.

CONCLUSION

The incidence of cesarean section is influenced by various maternal and fetal factors that are significantly related, including the mother's secondary and higher education level, primiparous and multiparous parity, prolonged labor, cephalopelvic disproportion, history of previous labor, severe preeclampsia, maternal age and weight, fetal weight, placenta previa, premature birth, and fetal malposition. Multivariate analysis showed that prolonged labor was the most dominant factor associated with cesarean section. In contrast, maternal occupation, threatened uterine rupture, antepartum hemorrhage, history of previous cesarean section, maternal height, pregnancy spacing, fetal distress, and multiple pregnancies did not show a significant association. Overall, the decision to deliver by cesarean section is influenced not only by medical considerations, but also by psychological and social factors, including risk perception, sense of safety, family support, and the role of health workers in providing information and recommendations for the safety of the mother and baby.

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