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Determinant Factors Of Caesarean Section Delivery In Central Java (SDKI Data Analysis)

Syifa Sofia Wibowo[1]*, Widya Ratna Wulan[2], Respati Wulandari[3], Ika Pantiawati[4], Dinar Indri Bakti Salsabila[5]

[1,2,3,4]Faculty of Health Science, Universitas Dian Nuswantoro
[5]Midwifery Department, Poltekkes Kemenkes Semarang

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Abstract

Central Java Province continues to hold the third-highest MMR in Indonesia as of 2023. Caesarean section births are maternal services associated with rates of maternal and newborn morbidity and mortality. The purpose of this study is to examine the factors influencing Caesarean section births in the province of Central Java. The 2017 Indonesian Demographic Health Survey (IDHS) provided the data used in this investigation. 1,060 data were gathered after sorting, and total sampling was employed. SPSS was used to analyze the data, utilizing the frequency distribution for univariate analysis and the Pearson Product Moment test for bivariate analysis. Mothers between the ages of 26 and 28 who have two children, have not given birth in the past year, have a middle-class income, have no problems during childbirth, have neither high blood pressure nor low blood pressure, and whose kids are not breech are the data mode based on study data. Every circumstance influences the decision to use a caesarean section as a delivery procedure. The family's financial situation has the biggest impact on the variable of caesarean delivery.

Correspondence Address:
Faculty of Health Science, Universitas Dian Nuswantoro, Indonesia
E-mail:
syfa.sofia.wibowo@dsn.dinus.ac.id

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Introduction

The process of releasing the embryo and placenta at full term, which occurs between 37 and 42 weeks of gestation, is known as childbirth (Sitepu et al., 2024). Numerous potential difficulties during labour can result in morbidity and mortality for both moms and newborns (Pengurus Pusat Perkumpulan Obstetri dan Ginekologi ndonesia, 2022). All deaths during pregnancy, childbirth, and the postpartum period that are attributable to their treatment and not to other causes like accidents or events are referred to as the Maternal Mortality Rate (MMR). MMR is a crucial metric for evaluating the effectiveness of maternal health initiatives and for determining the level of public health (Badan Pusat Statistik, 2024).

In the 2024 RPJMN, the MMR target is 183 per 100,000 live births. By 2030, the MMR objective set forth in the SDGs is 70 per 100,000 live births. In 2021, 976 incidents of maternal death were reported in Indonesia. In 2022, this figure dropped to 359 instances. In 2023, maternal mortality rose to 466 instances once more (Badan Pusat Statistik, 2024). The data indicates that the number of maternal fatalities in Indonesia continues to fluctuate.

Central Java Province continues to hold the third-highest MMR in Indonesia as of 2023 (Kementerian Kesehatan Republik Indonesia Tahun 2024, 2024). The greatest strategies to lower MMR include safe birth, appropriate postpartum care, and routine ANC check-ups. According to a number of reports, mothers are increasingly choosing cesarean sections (CS) over traditional deliveries (Aningsih & Amalia, 2025).

Cesarean section deliveries are among the maternal care services associated with rates of maternal and newborn morbidity and mortality. An abdominal incision is made during a cesarean section, a surgical procedure used to deliver a fetus and achieve pregnancy (Pengurus Pusat Perkumpulan Obstetri dan Ginekologi ndonesia, 2022). The World Health Organization (WHO) recently reported that the number of cesarean sections performed worldwide has increased to about one in five (21%) of all deliveries. According to the study, this percentage is anticipated to rise over the next ten years, with almost one-third (29%) of all deliveries being caesarean sections by 2030 (WHO, 2021).

Although caesarean sections can be a necessary and life-saving surgical treatment, if they are carried out without clear medical justifications, they may provide needless short- and long-term health risks to both mothers and babies (Angolile et al., 2023; Betran et al., 2021). Numerous distinct reasons contribute to the annual rise in the number of caesarean deliveries worldwide. This circumstance led the author to investigate the factors that influence cesarean section deliveries, specifically in the Central Javan province. Data from the 2017 DHS Program was used in the study. The purpose of this study is to examine the factors that affect deliveries by cesarean section in the province of Central Java.

Methods

Data from the 2017 Indonesian Demographic Health Survey (IDHS) were used in this investigation. After fulfilling a few predetermined restrictions, the data can be accessed from the DHS Program website. Although the IHDS is carried out every five years, data collection in Indonesia was last completed in 2017, and for several reasons, no survey was carried out in 2022. Direct interviews and home visits with research participants were used to collect cross-sectional IHDS data.

The Central Java SDKI population comprised 5,231 data points. The population was categorized according to the criteria for inclusion and exclusion. The study's inclusion criteria included mothers who were Central Javan residents and mothers who had just given birth. Data from cesarean deliveries that were either unrecorded or unknown were excluded from the study. Total sampling was the sampling method employed, and 1,060 data points were acquired after sorting.

Delivery by cesarean section was the study's dependent variable. Maternal age, birth within a year, economic status, delivery difficulties, low/high blood pressure, and breech presentation were the six independent variables that were examined. Categories on each variable adjust to the data already provided by the DHS Program data center. SPSS 27 software was used for the data analysis, which included univariate analysis using frequency distribution and bivariate analysis using Pearson Correlation test. A tutorial to interpreting Pearson Correlation test is provided below:

Table 1. Test result interpretation guide

Parameters	Value	Interpretation
correlation strength	0.0 - <0.2	Very weak
	0.2 - <0.4	Weak
	0.4 - <0.6	Intermediate
	0.6 - <0.8	Strong
	0.8 - <1.00	Very strong
significance value	*p* >0,05	Not significant
	p <0,05	Significant
direction of correlation	Positive	The higher variable A is, the higher variable B is
	Negative	The higher variable A is, the lower variable B is

Results

In this study, 1,060 data points were chosen as the sample size. The following table displays the findings of the frequency distribution analysis of the independent and dependent variables:

Table 2. Frequency distribution results for each variable

Variable	Total	%
Sectio caesarean birth		
Yes	170	16.0
No	890	84.0
Mother's age		
17-19 years	14	1.3
20-22 years	90	8.5
23-25 years	152	14.3
26-28 years	178	16.8
29-31 years	171	16.1
32-37 years	138	13.0
38-40 years	156	14.7
41-43 years	95	9.0
44-46 years	43	4.1
44-46 years	18	1.7
47-49 years	5	0.5
Birth in 1 year		
No birth	780	73.6
Once	278	26.2
Twice	2	0.2
Wealth index		
Poorest	128	12.1
Poorer	219	20.7
Middle	275	25.9
Richer	249	23.5
Richest	189	17.8
Complication during pregnancy		
Yes	178	16.8
No	792	74.7
Low/high blood pressure		
Yes	11	1.0
No	1049	99.0
Baby in wrong position		
Yes	92	8.7
No	968	91.3

The data used in this study met the inclusion criteria. The results showed that 16% of mothers gave birth using the CS method. It is evident from the above table that 170 mothers had cesarean sections. Based on the data above, the mode of data is mothers between the ages of 26 and 28 who have two children, have not given birth in the last year, have a middle-class income, have no problems during childbirth, have neither high blood pressure nor low blood pressure, and whose kids are not breech.

The Pearson Product Moment test was employed to analyze the bivariate results. The findings of this study's examination of the dependent and independent variables are as follows:

Table 3. Bivariate analysis results

Variable	Analysis	Score
Sectio caesarean birth with mother's age	pearson correlation	0,62
	Sig. (2 tailed)	0,043
	N	1060

Variable	Analysis	Score
Sectio caesarean birth with birth in 1 year	pearson correlation	0,62
	Sig. (2 tailed)	0,043
	N	1050
Sectio caesarean birth with wealth index	pearson correlation	1,39
	Sig. (2 tailed)	0,001
	N	1060
Sectio caesarean birth with complication during pregnancy	pearson correlation	0,95
	Sig. (2 tailed)	0,003
	N	1060
Sectio caesarean birth with low/high blood pressure	pearson correlation	0,82
	Sig. (2 tailed)	0,007
	N	1060
Sectio caesarean birth with baby in wrong position	pearson correlation	0,84
	Sig. (2 tailed)	0,006
	N	1060

Discussion

The Pearson Product Moment test results have two meanings, namely the Pearson Correlation results, which indicate the direction and strength of the relationship between variables, and the Sig. (2-tailed) value, which indicates the significance of the relationship in a study. Based on Table 2, it is known that all independent variables (mother's age, birth over 1 year, economic status, complications during childbirth, low/high blood pressure, and breech presentation) affect the dependent variable (childbirth by C-section) with a significance value >0.05.

With a p-value of 0.043, it was discovered that the maternal age variable affected the decision to have a caesarean section as the delivery mode. With a score of 0.62, the Pearson correlation coefficient demonstrated the direction and intensity of the link, indicating a substantial correlation between the mother's age and her likelihood of choosing a caesarean section delivery. According to research conducted in 2023 at the Ulin Banjarmasin Regional General Hospital, moms over 35 are more likely to experience complications during pregnancy and childbirth (Norbaiti et al., 2024). Age is one factor that may indicate a C-section delivery; women over 35 are more likely than those between the ages of 20 and 34 to experience problems during childbirth (Wijaya, 2023).

This variable influences the choice of SC delivery technique, as evidenced by the birth variable in 1 year having a significance value >0.05, specifically 0.043. According to the correlation's direction, the SC delivery method is employed more frequently when a mother gives birth more frequently. With a correlation level of 0.62, these two variables are strongly correlated with one another. According to the findings of the study conducted at Nene Mallomo Regional General Hospital, South Sulawesi, parity and cesarean section birth are connected. Both the mother and the fetus may be at risk from a high parity delivery since the uterine muscular tissue weakens and may result in a number of issues or risks during delivery (Jusman, 2023).

A significance score of 0.001 indicated that the factors of economic status and birth via caesarean section were significant. The two variables had a very strong link, as indicated by the Pearson correlation value of 1.39. The link was positive, indicating that mothers were more likely to select a C-section as the result of their economic standing. Economic position, namely family income, is a determining factor in caesarean section delivery, according to research conducted at Wiradadi Husada General Hospital. The likelihood of a caesarean section delivery is 3.4 times higher for families with sufficient financial standing than for those with less. The neighborhood is seeing an increase in the number of births performed via cesarean section (Riyanto, 2025). Given that giving birth by C-section without a medical indication cannot be covered by health insurance or health coverage, there are signs that mainly wealthy families choose to have this procedure done (Sugiarno & Wiwin, 2020).

There is a substantial correlation between labor complications and characteristics related to cesarean section (CS) delivery. Given the relationship's favorable trend, mothers who encounter labor problems are more likely to choose for cesarean sections. The Pearson correlation between these two variables is 0.95, indicating a very strong association. Similar findings from a 2023 study at Medika Stannia Sungailiat Hospital in the Bangka Belitung Islands indicated that pregnancy problems are a risk factor for delivery by cesarean section. One way to prevent birth by cesarean section is to screen throughout pregnancy (Sudarsih et al., 2023).

There is a noteworthy correlation between characteristics related to cesarean section delivery and low/high blood pressure. These factors have a very significant link with one another (Pearson correlation 0.82). Mothers with low or high blood pressure are more likely to select cesarean section delivery because of the positive direction of the link between the two factors. Blood vessel vasospasm in pregnant women with hypertension and preeclampsia can disrupt uteroplacental circulation and induce respiratory distress in the fetus. Compared to pregnant women without preeclampsia, those with preeclampsia have a 3.18-fold higher chance of giving birth via cesarean section (Asta et al., 2023).

The last variable was breech presentation, which was similarly highly linked with the variable of cesarean section delivery. Mothers who are expecting breech babies are more likely to decide to have a C-section because of the favorable orientation of the relationship. These factors have a very significant link with one another (Pearson correlation 0.84). After the buttocks and abdomen are delivered vaginally, breech presentation in the fetus may result in hypoxia because of compromised placental blood circulation. Vaginal birth might put moms at risk for infection and prolonged labor (Retni et al., 2024). Moms who give birth with a breech presentation are reported to be 4.82 times more likely to die than moms who give birth with a normal fetal position (Setiana et al., 2019).

This study's limitation is that the tests used were only bivariate. Future research could conduct statistical tests up to the multivariate level. Another limitation is the research variables. Future researchers could use more variables provided by the DHS Program to produce more comprehensive data.

Conclusion

All variables used in the study showed a relationship between factors causing labor and the CS method. Risk factors or causes of caesarean section delivery in Central Java Province include maternal age, births within a year, economic status, labour problems, high/low blood pressure, and breech presentation. The family's financial situation has the biggest impact on caesarean delivery.

Author Contributions

S.S.W, DISB; original draft preparation, writing, methodology, resources. WRW, IP, RW; validation, review, editing, project administration.

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Institutional Review Board Statement

It is not applicable because the studies do not involve hhumans or animals.

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Conflicts of Interest:

The authors declare nno conflict of interest.

Appendix A

Table 1. Test result interpretation guide
Table 2. Frequency distribution results for each variable
Table 3. Bivariate analysis results

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