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Factors Influencing Cesarean Section (Cs) Deliveries In Indonesia (DHS Program Analysis)

Syifa Sofia Wibowo[1*], Aprianti[2], Syarifah Aqil Wibowo[3], Atikah Syadza Fadillah[4]

[1,2] Faculty of Health Science, Universitas Dian Nuswantoro, Jl. Imam Bonjol No.207, Central Java 50131, Indonesia
[3] Faculty of Psychology, Soegijapranata Catholic University, Jl. Pawiyatan Luhur Sel. IV No.1, Central Java 50234, Indonesia
[4] Praktik Mandiri Bidan Esti Husada, Jl. Karangroto, Central Java 50117, Indonesia
**Corresponding Author : syfa.sofia.wibowo@dsn.dinus.ac.id*

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Abstract . There are numerous potential issues that might arise during birth, leading to morbidity and even death for both mothers and fetuses. Indonesia's 2020 Maternal Mortality Rate (MMR) was 189 fatalities for every 100,000 live births. Cesarean section (CS) is one maternal care intervention that has a strong correlation with maternal and fetal morbidity and mortality. Finding the contributing factors to cesarean sections deliveries in Indonesia is the aim of this study. Data on 17,746 respondents was gathered after controlling for the inclusion and exclusion criteria. Frequency tests were utilized for univariate analysis, and Pearson Product Moment tests were used for bivariate analysis. 2,915 mother's had cesarean section deliveries; the majority of these mothers were between the ages of 30 and 34 and came from extremely low-income backgrounds. 2,117 births included prolonged labor and 1,331 were breech presentation. Cesarean section delivery can be influenced by the mother's age (p-value 0,001), wealth index (p-value 0,001), breech position (p-value 0,001) and prolonged labor (p-value 0,001). Among these four variables, the one with the strongest correlation is the wealth index (pearson correlation 0,244).

Keywords: Caesarean section, DHS data, maternal age, wealth index, breech position, prolonged labor

INTRODUCTION

Expelling the fetus at full term or between weeks 37 and 42 of pregnancy, followed by a spontaneous vaginal birth with an occipital presentation lasting less than 18 hours and no problems between the mother and the fetus, is considered normal labour and delivery (1). There are numerous potential issues that might arise during birth, leading to morbidity and even death for both mothers and fetuses. The most frequent issues after

delivery, according to data from the 2023 Indonesian Health Survey, are hemorrhage, breech presentation, prolonged labor, hypertension, premature rupture of membranes and cord entanglement (2). Indonesia's 2020 Maternal Mortality Rate (MMR) was 189 fatalities for every 100,000 live births. 183 fatalities per 100,000 live births is the 2024 RPJMN target, which is still not met by this number. This number is much more dissimilar from the MMR's SDGs target, which is 70 fatalities for every 100,000 live births (3).

Cesarean section (CS) is one maternal care intervention that has a strong correlation with maternal and fetal morbidity and mortality. A cesarean section involves making an incision in the mother's abdomen to deliver the fetus and achieve pregnancy (4). In Indonesia, 17.6% of 78,736 newborns were delivered by cesarean section, according to data from the 2018 Basic Health Research or Riskesdas (5). In practice, cesarean section deliveries are frequently carried out without medical indications, even though they should be accompanied by them. Mothers are put at risk by frequent and overuse of cesarean section, which can result in complications such placenta accreta and an increased risk of infection (4).

BPJS Kesehatan does not cover cesarean section deliveries in Indonesia unless there are medical reasons for them. According to data from the 2018 Riskesdas study, 53.3% of deliveries are paid for privately without utilizing BJPS, health insurance, or any other form of government-provided health care. According to the data, the trend of C-section deliveries in Indonesia aligns with the information currently available on the sources of childbirth finance (5). Hospitals, whether private or run by the government, are required to provide C-section deliveries. The majority of deliveries (32.7%) take place in hospitals, according to the 2018 Riskesdas data, as opposed to clinics, community health centers, and village maternity clinics (5).

A medical diagnostic made by an obstetrician and gynecologist must support the need for a cesarean section, which should be carried out following a number of procedures. Cesarean sections can be used to deliver babies with conditions such fetal malposition, multiple pregnancies, placenta previa, placenta accreta, moms with HIV and other illnesses, preterm pregnancies, and cephalopelvic disproportion. It is estimated that difficulties or abnormalities occur in 23.2% of births in Indonesia. Premature rupture of the membranes (5.6%), prolonged labor (43%), and breech presentation (3.1%) are the most frequent problems (5). In this study, researchers used large-scale data, namely the Indonesian Demographic and Health Survey (SDKI), as a data source. This was done to bridge the existing research gap. This analysis employs DHS program data for Indonesia because of the aforementioned data. The aim of this study is to finding the contributing factors to cesarean sections deliveries in Indonesia.

METHODS

The DHS Program particularly for Indonesia, also known as the SDKI (Indonesian Demographic Health Survey), provided the secondary data used in this study. By following the instructions on the DHS Program website, you can get SDKI data. Data from the 2017 survey is used in the most recent Indonesian survey. Although this survey is carried out every five years, it was not carried out in Indonesia in 2022. Numerous continents, including America, Asia, Africa, and the Middle East, have seen health surveys carried out under

the DHS Program. Through technical assistance and field data collecting, USAID (United States Agency for International Development) and ICF support the SDKI survey in Indonesia (6).

Maternal age, wealth index, prolonged labor, and breech presentation were the study's independent variables. Cesarean delivery was the dependent variable. Data for the study was gathered door-to-door by the DHS Program using a cross-sectional approach. Direct interviews were performed with every survey participant. Research subject bias (or respondent bias) in the Indonesian Demographic and Health Survey (IDHS) data is generally related to the data's reliance on self-reported data. For example, respondents had difficulty accurately remembering details of past events, for example events during a previous birth, which was one of the variables in this study.

In Indonesia, 86,265 respondent data points were successfully gathered from the SDKI data. There had to be no missing data on any of the variables utilized in this study, and participants had to have answered all of the questions for each variable. Respondents with incomplete data were excluded based on certain criteria. Data on 17,746 respondents was gathered after controlling for the inclusion and exclusion criteria. Total sampling, which uses all data that satisfies the research objectives, was the sample strategy employed in this study. SPSS 25 software was used for data processing and analysis. Frequency tests were utilized for univariate analysis, and Pearson Product Moment tests were used for bivariate analysis.

RESULT

The following are the findings of univariate analysis for factors including cesarean section delivery, maternal age, wealth index, breech presentation and prolonged labor:

Table 1. Results of univariate analysis of each research variable

Variable	Category	Frequency (n)	Percentage (%)
Caesarean section delivery	Yes	2915	16,4
	No	14831	83,6
Maternal age	15-19 years	435	2,3
	20-24 years	2796	15,8
	25-29 years	4556	25,7
	30-34 years	4679	26,2
	35-39 years	3495	19,8
	40-44 years	1473	8,4
	45-49 years	312	1,8
Wealth index	Poorest	4927	27,8
	Poorer	3462	19,5
	Middle	3245	18,3
	Richer	3120	17,6
	Richest	2992	16,9
Breech presentation	Yes	1331	7,5
	No	16415	92,5
Prolonged labor	Yes	2117	11,9
	No	15629	88,1

According to the findings of the aforementioned univariate study, 2,915 mother's had cesarean section deliveries; the majority of these mothers were between the ages of 30 and 34 and came from extremely low-income backgrounds. 2,117 births included prolonged labor and 1,331 were breech presentation.

The following are the findings of the bivariate data analysis between the dependent variable and the four independent variables with significance <0,05.

Table 2. Results of bivariate analysis using Pearson Product Moment tests

Variable	Statistic test	Result
Maternal age with caesarean section delivery	Pearson correlation	0,092
	Sig. (2-tailed)	0,001
	N	17746
Wealth index with caesarean section delivery	Pearson correlation	0,244
	Sig. (2-tailed)	0,001
	N	17746
Breech presentation with caesarean section delivery	Pearson correlation	0,067
	Sig. (2-tailed)	0,001
	N	17746
Prolonged labor with caesarean section delivery	Pearson correlation	0,031
	Sig. (2-tailed)	0,001
	N	17746

Table 2 indicates that every variable, including breech presentation, prolonged labor, economic status, and maternal age, plays a role causing cesarean section delivery. Family economic status had the strongest Pearson correlation value among the four independent variables.

DISCUSSION

Among the factors that lead to a cesarean delivery, maternal age has a Sig. (2-tailed) value of 0.001. The second-highest of the four independent variables' Pearson correlation values is 0.092. Also, the study's results indicate a positive value, indicating that the older the woman, the higher the chance of a cesarean section during birth. With an adjusted chances ratio of 1.51, nulliparas are more likely to experience an unplanned cesarean delivery if they are older (7). Compared to the general obstetric population in the Netherlands, women who are very advanced in age and those who are advanced in maternal age are more likely to have an unexpected cesarean section. Higher BMI, no prior vaginal birth, and the length of time required for cervical priming all increase risk (8).

A family is more likely to select a cesarean section if they are wealthier, according to positive Pearson's correlation values. Similar findings have also been discovered in Nepal, where a cesarean section birth can be influenced by the wealth index up to 6.7 times. In the Philippines, there is a clear correlation between socioeconomic differences and cesarean section deliveries (9). The likelihood of a mother having a cesarean section delivery increases with her level of affluence. According to a socioeconomic status analysis, women in the "poorer" category had a 1.758-fold higher likelihood of undergoing cesarean section delivery than those in the poorest group (10).

With a Sig. (2-tailed) value of 0.001, a breech presentation is also a decisive factor for cesarean section birth. With a positive Pearson correlation value of 0.067, it is clear that a breech infant has a higher chance of

being delivered via cesarean section. One sign that a cesarean delivery is necessary is a breech presentation. A transverse lie cannot be delivered naturally; if it is, it may hinder labor and result in the death of the fetus or even the mother (11). The transverse lying of the fetus is one of the medical indications for a cesarean section. According to a 2021 study conducted at Yadika Kebayoran Lama Hospital, pregnant women who have a history of fetal position are 3,413 times more likely to have a cesarean delivery than those who do not (12).
Prolonged labor on cesarean section delivery was the next variable examined, and it had a Sig. (2-tailed) value of 0.001, indicating that these two factors were influenced by each other. The C-section approach was more frequently chosen the longer the delivery time was needed, according to the positive Pearson correlation value of 0,031. About half of C-sections in Tanzania in 2024 were carried out during labor with straightforward labor progression, according to research that revealed that many C-sections were carried out as a result of protracted labor (13). Another study conducted in Norway in 2020 found that in the unadjusted analysis, the chance of a subsequent desire for a cesarean delivery was more than twice for protracted labor (odds ratio (OR) 2.66, 95% CI 1.42–4.99) (14).

The limitation of this research is that the researcher did not research based on province so that specific results per province cannot be known. The data provided by the SDKI is very diverse, and this study is limited to only four determinant variables. Future research is expected to examine more variables by including the region of each respondent.

CONCLUSION

Cesarean section delivery can be influenced by the mother's age (p-value 0,001), wealth index (p-value 0,001), breech position (p-value 0,001) and prolonged labor (p-value 0,001). Among these four variables, the one with the strongest correlation is the wealth index (pearson correlation 0,244).

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