

Determinants of cesarean delivery in Indonesia: An analysis of the 2017 Indonesia demographic and health survey

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Determinants of cesarean delivery in Indonesia: An analysis of the 2017 Indonesia demographic and health survey

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Abstract

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Background: According to a statement by the World Health Organization (WHO), the optimal proportion of sectio caesarea (SC) is considered to be between 10-15%. In Indonesia, based on survey data for deliveries using the sectio caesarea (SC) method, the cases increased from 9.8% in 2013 and 17.6% in 2018.

Purpose: To determinants of cesarean delivery in Indonesia: An analysis of the 2017 Indonesia demographic and health survey

Method: This type of research is a quantitative study with a cross sectional design. The population and sample in this study were 14,087 women of childbearing age 15-49 years who had complete variables. Data analysis used chi square, and multiple logistic regression.

Results: Found that there was a significant relationship between sectio caesarea with maternal age, mother's occupation, wealth index, place of residence, spouse's occupation, partner's education, type of birth, history of ANC visits, baby size, health facilities, history of pregnancy complications and delivery, history of miscarriage with p-value < 0,001. And there is no relationship between sectio caesarea and maternal education with a p-value of 0.862. The dominant factor that affects mothers giving birth by caesarean section is the type of birth with an OR of 2.854 times (CI 95% 1,932 – 4,206).

Suggestion: It is expected that people who have undergone IVF or pregnancy insemination will carry out the fertilization alone in order to reduce the risk of giving birth by caesarean section and for women who are already pregnant with multiple pregnancies are expected to be more diligent in conducting ante-natal care visits so that they can better detect the progress of their pregnancy and prevent complications. which will allow delivery by caesarean section.

Keywords: Section caesarea; Delivery; IDHS

INTRODUCTION

Childbirth is a process of expulsion of the products of conception namely the fetus and also the placenta which is full term or can live outside the womb through the birth canal or through other routes (Lubis, 2018). There are two options that can be used in the delivery process, namely spontaneous labor and delivery by surgery caesarean section (SC). Spontaneous delivery is the process of removing the fetus through the genitals that occurs at 37-42 weeks of pregnancy

without complications for the mother and fetus (Maulidya, 2019). While giving birth caesarean section (SC) is a surgical process to deliver a fetus through an incision in the abdominal wall and uterine wall (Erika & Iri, 2020). According to another opinion caesarean section (SC) is a surgical procedure to deliver a fetus by opening the abdominal wall and uterine wall or vagina or a hysterotomy to deliver a fetus from the

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uterus (Ayuningtyas, Oktarina, Misnaniarti, & Sutrisnawati, 2018).

According to a World Health Organization (WHO) statement, the proportion *caesarean section* the optimal (SC) range is considered to be between 10-15% (Hailegebreal, Gilano, Seboka, Ahmed, Simegn, Tesfa, & Yehualashet, 2021). Later this statement was challenged because the data on which the recommendations were based was limited and drawn mainly from northern European countries. In a more recent statement, the WHO stated that the level *caesarean section* (SC) based on population not > 10% (Adewuyi, Auta, Khanal, Tapshak, & Zhao, 2019). However, rate *caesarean section* (SC) remains high and continues to increase in various industrialized countries. In the world, currently 1 in 5 women give birth through *caesarean section* (SC) with a global level average *caesarean section* (SC) is 18.6%, ranging from 6.0% to 27.2% in each of the more developed regions (Tsegaye, Desalegne, Wassihun, Bante, Fikadu, Debalkie, & Yeheyis, 2019).

In Indonesia based on birth survey data with the method *caesarean section* (SC), the cases increased from 2013 by 9.8% and 2018 by 17.6%.

Furthermore, based on the results of the 2018 Basic Health Research, out of a total of 78,736 deliveries, it shows the prevalence of *caesarean section* (SC) at delivery of 17.6 percent, of which the highest was in DKI Jakarta (31.3%) followed by Bali (30.2%) then North Sumatra (23.9%) and the lowest was in Papua (6, 7%) (The Ministry of Health of the Republic of Indonesia, 2014 & 2019).

Should *caesarean section* (SC) is only performed if medically necessary because it can cause several complications such as disability and death. And it can be detrimental to the health of mothers and newborns (Hailegebreal et al., 2021). One of the main problems in *caesarean section* (SC) in addition to the risks and complications of postpartum is the cost. These costs can increase due to surgery and also the need for a longer hospital stay, which can result in an increased financial burden on the family (Verma, Vishwakarma, Nath, Khan, Prakash, & Abid, 2020).

From several studies show the factors that encourage vaginal delivery *caesarean section* (SC)

including ages between 30 – 39 (36.19%) have an incidence rate *caesarean section*(SC) is higher (Hailegebreal et al., 2021), the education of mothers with secondary and higher levels of education and private medical facilities are more likely to undergo *caesarean section* (SC), Childbirth *caesarean section* (SC) is generally more common in women whose baby sizes are very large or smaller than average (Verma et al., 2020), urban residence is associated with the likelihood *caesarean section* (SC) higher (75.27%) (Hailegebreal et al., 2021), the type of birth that increases the chances of delivery *caesarean section* (SC) is multiple births, then spouse's occupation and marital status (Adewuyi et al., 2019), then more than a third (35%) of women's husbands have a higher education level than primary school and 30% of women who belong to the highest wealth quintile undergo *caesarean section* (SC) in her last labor. Of the approximately 78% of women who did not report having pregnancy complications, 12% of them did *caesarean section* (SC). Then from about 9% of women who do not have complications during childbirth they undergo *caesarean section* (SC) (Karim, Ali, Khan, Hassan, Hasan, Hoque, Billah, & Chowdhury, 2020). For the order of birth of children, more than half of the total respondents (56.7%) were gravid II-IV. The majority of respondents (96.3%) had a history of ANC treatment and 11.1% of women had a history of miscarriage which is an indication for ANC *caesarean section* (SC) (Tsegaye et al., 2019). Among women who have a history *caesarean section* (SC) before, probably *caesarean section* (SC) is 3.4 times higher than those who have no history *caesarean section* (SC) before. Then opportunity *caesarean section* (SC) is 2.67 times higher among women who work as housewives (Taye, Nega, Belay, Kibret, Fentie, Addis, & Fenta, 2021). In terms of religion, Muslim women are 12% more likely to give birth through *caesarean section* (SC). In India, around 16 and 11% of respondents have experienced miscarriage and complications of childbirth, respectively, so they have a higher probability of giving birth vaginally *caesarean section* (SC). Regarding age at marriage, prevalence of childbirth *caesarean section* (SC) is much higher among women who are married at

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age 18 or older (Roy, Paul, Chouhan, Rahaman, & Kapasia, 2021). And according to the clinicians who are members of the *National Sentinel Caesarean Birth Audit*, about 79% of deliveries *caesarean section* (SC) is performed at the request of the patient and this is one of the reasons for the increasing incidence of childbirth with *caesarean section* annually (Ulfa, 2021).

Based on IDHS data from all women of childbearing age (15-49 years), there were 49.2% of mothers who gave birth by the *caesarean section* (SC). Mothers aged 20-35 years are the group with the most age, namely 76.3% (Sulistianingsih & Bantas, 2018).

RESEARCH METHOD

This type of research is a quantitative study using secondary data from the 2017 IDHS. This research was conducted in April 2022, to determine the determinants of factors affecting delivery by Section Caesarea (SC) in Indonesia. The research design used a cross-sectional study design or a cross-sectional study design. The population and sample in this study used census block list as the basis for sampling. The sample includes 1,970 census blocks covering both urban and rural areas. From the number of census blocks, 49,261 households were selected, and 47,963 households were successfully interviewed.

Then from 47,963 households that were successfully interviewed, there were 49,627 women of

childbearing age aged 15-49 years. The number of samples used in this study were all female respondents of childbearing age who met the inclusion criteria; female respondents of childbearing age who have given birth, and the exclusion criteria for incomplete variable data from female respondents of childbearing age who have given birth. And obtained a sample of 14087 respondents.

The dependent variables in this study were deliveries categorized as spontaneous and section caesarian. And the independent variable, namely the age of the mother, is categorized as high risk if aged < 20 and > 35 years and low risk if aged 20-35 years; education is categorized as non-school, basic education (elementary to junior high school), secondary education (high school graduate), and higher education (academy and university); work; wealth index (poorer, middle, richer and richest); residence (urban and rural); desire to do SC; spouse work; spouse education; type of birth (single and twin); history of ANC visits (<4 or >4); baby size; health facilities (private/government); history of complications of pregnancy and childbirth; history of miscarriage and history of caesarean section.

Data analysis using chi square. Univariate analysis is used to explain or describe the characteristics of each variable and bivariate analysis is performed on two variables that are suspected to be related or have a correlation.

RESULTS

Table 1. Demographic Characteristic of Respondents (N=14.087)

Variable	Results (n/%)
Methods of Delivery	
Normal Vaginal	11.635/82,6
Caesarean Section	2.452/17,4
Mother's Age	
Low Risk	10.155/72,1
High Risk	3932/27,9
Mother's Education	
No Education	164/1,2
Base and Secondary	11.506/81,7

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Height	2.417/17,1
Occupation	
Unemployment	7.495/53,2
Employee	6.592/46,8
Wealth Index	
Poor	6.371/45,2
Middle	2.710/19,3
Rich	5.006/35,5
Residence	
Rural	6.993/49,6
Urban	7.094/50,4
Cesarean Delivery Desire	
Yes	1.018/7,2
No	13.069/92,2
Birth Type	
Single	13.977/99,2
Twin	110/0,8
ANC Checkup History	
< 4	1.917/13,6
> 4	12.170/86,4
Baby Size	
Don't know	174/1,2
Very small	1846/13,1
Average	7.469/53,0
Very large	4.598/32,7
Medical Facility	
Government	5.056/35,9
Private	9.031/64,1
History of Complications of Pregnancy and Childbirth	
Have not	11.645/82,7
Have	2.442/17,3
Miscarriage History	
Never had	13.102/93
Had	985/7
History Caesarean Section	
Have not	11.635/82,6
Have	2.452/17,4
History Abortion	
Have not	11.635/82,6
Have	2.452/17,4
Husband's Occupation	
Agricultural sector	3.580/25,4
Employees	8.336/59,2
Professional / Technical / ManagerCouples Education	2.171/15,4

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Husband's Education	
No education	178/1.3
Base and Secondary	11.793/83,8
Height	2.116/15,0

Based on table 1, it can be seen that out of a total of 14,087 deliveries, there were 11,635 (82.6%) spontaneous deliveries and 2,452 (17.4%) spontaneously caesarean section. Furthermore, for low-risk maternal age caesarean section 10,155 (72.1%) mothers and ages who are at high risk caesarean section 3,932 (27.9%) mothers. For the education of mothers who gave birth, there were 3,574 (25.4%) mothers with primary education, 7,932 (56.3%) secondary education mothers, 2,417 (17.2%) tertiary education, and 164 (1.2%) unschooled (%). Then there were 7,495 (53.2%) mothers who did not work and 6,592 (46.8%) mothers who worked. Furthermore, for the wealth index itself, there are 5 division categories namely 3,568 (25.3%) poorest, 2,803 (19.9%) poor, 2,710 (19.2%) middle, 2,579 (18.3%) richest, and 2,427 (17.2%) richest). Then for the mother's residence there are 6,993 (49.6%) mothers living in rural areas and 7,094 (50.4%) mothers living in urban areas. For childbirth caesarean section of 2,452 mothers who have a personal desire to do caesarean section there were as many as 1,018 (7.2%) and not personal wishes 1,434 (10.2%).

Furthermore, for the work of spouses of mothers who gave birth there were 3,580 (25.4%) who worked in the agricultural sector, 3,601 (25.6%) worked as informal outside the agricultural sector, 4,735 (33.6%) worked as employees or clerks, and 2,171 (15.4%)

worked as professionals or technicians or managers. Then for the education of partners of mothers who have given birth there are 3,702 (26.43%) primary education, 8,091 secondary education (57.4%), 2,116 (15.0%) tertiary education, and 178 (1.3%) unschooled.

For the most regular type of birth, there were 13,977 (99.2%) single births and 110 (0.8%) twin births. And the number of ANC visits was 1,917 (13.6%) mothers who visited < 4 times and 12,170 (86.4%) mothers who visited ANC ≥ 4 times. During delivery it was found that there were 264 very small babies (1.9%), smaller from an average of 1,581 (11.2%), an average of 7,469 (53.0%), greater than an average of 3,868 (27.5%), greater than an average of 3,868 (27.5%), very large 730 (5.2%), and unknown 174 (1.2%). Furthermore, from all delivery processes, 5,056 (35.9%) chose to deliver at government health facilities and 9,031 (64.1%) private health facilities. Then for a history of previous pregnancies and deliveries that had complications as many as 2,442 (17.3%) and those without a history of 11,645 (82.7%). Mothers who had a history of miscarriage 985 (7.0%) and did not have a history of miscarriage 13,102 (93.0%). Furthermore, mothers with history caesarean section as much 2,452 (17.4%) and those with no history as many as 11,635 (82.6%).

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Table 2. The Analysis of Variables Factors with Caesarean Section and Normal Vaginal Delivery

Variables	Methods of Delivery		p-value	OR (95% CI)
	Normal Vaginal (n=11.635)	Caesarean Section (n=2452)		
Mother's Age (n/%)				
Low Risk Age	8.533/73.3	1.622/66.2	<0,001	1,408 (1,282-1,545)
High Risk Age	3.102/26.7	830/33.8		
Mother's Education (n/%)				
No Education	137/1.2	27/1.1	0,862	
Base and Secondary	9.515/81.7	1.991/81.2		
Height	1.983/17.1	434/17.7		
Occupation (n/%)				
Unemployment	6.320/54.3	1.175/47.9	<0,001	1,292 (1,184-1,410)
Employee	5.315/45.7	1.277/52.1		
Wealth Index (n/%)				
Poor	5.772/49.7	599/24.4	<0,001	
Middle	2.250/19.3	460/18.8		
Rich	3.613/31.0	1.393/56.8		
Residence (n/%)				
Rural	5.377/46.2	1.616/65.9	<0,001	0,444 (0,406-0,487)
Urban	6.258/53.7	836/34.1		
Husband's Occupation (n/%)				
Agricultural sector	3.212/27.6	368/15	<0,001	
Employees	4.101/58.5	1.535/62.6		
Professional / Technical	1.622/13.9	549/22.4		
Husband's Education (n/%)				
No education	168/1.4	10/0.4	<0,001	
Base and Secondary	9.972/85.7	1.822/74.3		
Height	1.495/12.9	621/25.3		
Birth Type (n/%)				
Single	11.566/99.4	2.411/98.3	<0,001	2,850 (1,932-4,206)
Twin	69/0.6	41/1.7		
ANC Checkup History (n/%)				
< 4	1.718/14.8	199/8.1	<0,001	1,961 (1,682-2,287)
> 4	9.917/85.2	2.253/91.9		
Baby Size (n/%)				
Don't know	167/1.5	7/0.3	<0,001	
Very small	1.474/12.6	372/15.2		
Average	6.208/53.3	1.261/51.4		
Very large	3.786/82.6	812/33.1		
Medical Facility (n/%)				
Government	3.914/33.6	1.142/46.6	<0,001	0,582 (0,532-0,635)
Private	7.721/66.4	1.310/53.4		

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History Caesarean section (n/%)				
Have not	9.904/85.1	1.741/71	<0,001	2,337 (2,112-2,585)
Have	1.731/14.9	711/29		
History Abortion (n/%)				
Have not	10.890/93.6	2.212/90.2	<0,001	1,586 (1,362-1,847)
Have	745/6.4	240/9.8		

Based on table 2, it is known that spontaneous labor is the most common with low-risk maternal age, 8,533 respondents (84.0%), while in caesarean section most of the age of the mother with a high risk of 830 respondents (21.1%). From the results of the chi test square obtained a p-value <0.001, which means that there is a significant relationship between maternal age with birth selection. Thus it is proven that the hypothesis states that maternal age is related to childbirth. And it can be seen based on the OR value of mothers who have a high risk age have a 1.408 times the risk of having a SC delivery compared to mothers with a low age.

It is known that during spontaneous deliveries, the majority were with secondary maternal education, 6,555 respondents (56.3%), while those with caesarean section the most in secondary maternal education is 1,377 respondents (56.3%). From the results of the chi-square test obtained a p-value of 0.862, which means that there is no significant relationship between maternal education and choice of delivery. Thus the hypothesis is not proven which states that maternal education is related to childbirth.

It is known that during spontaneous deliveries, most mothers did not work, 6,320 respondents (84.3%), whereas during caesarean section most working mothers 1,277 respondents (19.4%). From the results of the chi-square test, it was obtained that the p-value was <0.001, which means that there is a significant relationship between the mother's occupation and maternity selection. Thus the hypothesis is proven that the mother's occupation is related to childbirth. And it can be seen based on the OR value of working mothers who have a high risk of 1.292 times to have a SC delivery compared to mothers who do not work.

It is known that during spontaneous deliveries, most mothers with the poorest wealth index were

3,327 respondents (93.2%), whereas during deliveries caesarean section most mothers with the best wealth index 803 respondents (33.1%). From the results of the chi-square test obtained a p-value <0.001, which means that there is a significant relationship between the wealth index and the choice of delivery. Thus the hypothesis is proven which states the wealth index related to childbirth.

It is known that during spontaneous deliveries, most of them lived in urban areas, 6,258 respondents (88.2%), while those who delivered caesarean section most of them live in rural areas, 1,616 respondents (23.1%). From the results of the chi-square test, it was found that the p-value was <0.001, which means that there is a significant relationship between place of residence and choice of delivery. Thus the hypothesis is proven that the place of residence is related to childbirth. And it can be seen that based on the OR value, women who live in rural areas have a 0.444 times the risk of having a SC delivery compared to women who live in urban areas.

It is known that during spontaneous delivery, most mothers work as partners in the agricultural sector, 3,212 respondents (89.7%), while during childbirth caesarean section most widely mother with partner work as professional/technical/manager 549 respondents (25.3%). From the results of the chi-square test, it was found that the p-value was <0.001, which means that there is a significant relationship between the partner's occupation and the choice of delivery. Thus the hypothesis is proven that the partner's work is related to childbirth.

It is known that during spontaneous deliveries, most mothers with middle education partners, 6,616 respondents (81.8%), while during deliveries caesarean section most mothers with middle education partners 1,476 respondents (18.2%). From the results of the chi-square test a p-value <0.001 was obtained, which

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means that there was a significant relationship between the partner's education and the choice of delivery. Thus the hypothesis is proven which states that partner education is related to childbirth.

It is known that the type of spontaneous delivery is mostly with single 11,566 respondents (82.8%), while in caesarean section mostly types of twin births 41 respondents (37.3%). From the results of the chi-square test, it was found that the p-value was <0.001, which means that there is a significant relationship between species birth by birth selection. Thus the hypothesis is proven that the type of birth is related to delivery. And it can be seen based on the OR value of mothers who have mothers who have this type of twin birth have a 2,850 times the risk of having a SC delivery compared to mothers with this type of single birth.

It is known that the most spontaneous deliveries with a history of ANC visits <4 times, 1,718 respondents (89.6%), while those with caesarean section the most age of the mother with a history of ANC visits \geq 4 times 2,253 respondents (18.5%). From the results of the chi-square test, the p-value was <0.001, which means that there is a significant relationship between the history of ANC visits with choice of birth. Thus the hypothesis is proven that the history of ANC visits is related to childbirth. And it can be seen based on the OR value of mothers with a history of ANC visits \geq 4 times have a 1.961 times risk of having a SC delivery compared to mothers with a history of ANC visits <4 times.

It is known that in spontaneous delivery the most with an average baby size of 6,208 respondents (83.1%), while in childbirth caesarean section the most the average size is also 1,261 respondents (16.9%). From the results of the chi-square test a p-value <0.001 was obtained, which means that there was a significant relationship between baby size and choice of delivery. Thus the hypothesis is proven that the size of the baby is related to delivery.

It is known that spontaneous deliveries were mostly in private health facilities, 7,721 respondents

(85.5%), while in deliveries caesarean section mostly in private health facilities 1,310 respondents (14.5%). From the results of the chi-square test, it was found that the p-value was <0.001, which means that there is a significant relationship between health facilities with birth selection. Thus the hypothesis is proven which states that health facilities are related to childbirth. And it can be seen based on the OR value of mothers who give birth in private health facilities have a 0.582 times the risk of having a SC delivery compared to mothers giving birth in government health facilities.

It is known that the most spontaneous deliveries with no history of complications of pregnancy and childbirth were 9,904 respondents (85.0%), while those with caesarean section mostly with a history of complications of pregnancy and childbirth 711 respondents (29.1%). From the results of the chi-square test, the p-value was <0.001, which means that there is a significant relationship between the history of complications of pregnancy and childbirth with choice of birth. Thus the hypothesis is proven that the history of complications of pregnancy and childbirth is related to delivery. And it can be known based on the OR value of mothers who have a history of complications of pregnancy and childbirth have 2,337 times the risk of having a SC delivery compared to mothers with no history of complications of pregnancy and childbirth.

It is known that in spontaneous labor the most with never miscarriage was 10,890 respondents (83.1%), while in childbirth caesarean section the most with others having miscarried 240 respondents (24.4%). From the results of the chi-square test, it was found that the p-value was <0.001, which means that there is a significant relationship between history of confusion with the choice of birth. Thus the hypothesis is proven that a history of miscarriage is related to childbirth. And it can be seen that based on the OR value, women who have had a miscarriage have a 1.586 times the risk of having a SC delivery compared to mothers who have never had a miscarriage.

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Tabel 3. Multivariate Analysis

Variable	p – Value	OR	CI 95%	
			Lowest	Highest
Mother's Age	<0,001	1,425	1,290	1,574
Wealth Index	<0,001	1,423	1,366	1,482
Residence	<0,001	0,738	0,665	0,820
Spouse Education	<0,001	1,420	1,311	1,537
Birth Types	<0,001	2,854	1,860	4,378
Anc Checkup History	<0,001	1,338	1,138	1,574
Medical Facility	<0,001	0,482	0,438	0,531
History Of Complications Of Pregnancy And Childbirth	<0,001	2,120	1,905	2,359
History Abortion	<0,001	1,369	1,163	1,612
Wealth Index With Facilities Health	<0,001	1,237	1,146	1,335

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Based on the table above, it is known that the variable mother's age has OR 1.425, wealth index has OR 1.423, place of residence has OR 0.738, spouse's education has OR 1.420, type of birth has OR 2.854, history of ANC visits has OR 1.338, health facilities has OR 0.482, history complications of pregnancy and childbirth had an OR of 2.120, a history of miscarriage had an OR of 1.369, and there was an interaction between the wealth index variable and health facilities with an OR of 1.237.

DISCUSSION

Maternal Age

This is in accordance with the literature which states that the age of the mother also determines maternal health and is very closely related to the conditions of pregnancy, childbirth and the postpartum period as well as the baby. Age of pregnant women who are too young or being too old (35 years) is a factor complicating pregnancy, because pregnant women are too young, their bodies are not ready to face pregnancy, childbirth and care for their babies, while mothers who are 35 years or more will face risks such as congenital abnormalities and complications in time childbirth caused by uterine muscle tissue not accepting pregnancy well; the

reproductive process should take place in women aged between 20 and 34 years because complications of pregnancy and childbirth are rare (Anwar, Safitri, & Aisyah, 2022).

The researcher's analysis concluded that a good age to get pregnant is 20-35 years old. Women aged 20-35 have a very high fertility rate because the reproductive organs function at that age optimally. So for women with at-risk ages, namely <20 years and > 35 years tend to have a risk for the occurrence of complicating factors in pregnancy which will lead to vaginal delivery *section caesarea*.

Mother's Education

There is no significant relationship between maternal education and vaginal delivery *caesarean section* (SC). It is said in theory that the higher a person's level of education, the more information and knowledge he obtains, especially in the field of pregnancy health, so that changes in behavior in a positive direction are expected to occur. If the mother's knowledge is extensive, the mother can recognize the signs of a high-risk pregnancy so that she can prevent or treat pregnancy complications such as premature rupture of membranes, severe preeclampsia, bleeding, shoulder dystocia, fetal position abnormalities, etc.

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early. Conversely, if knowledge is lacking, especially regarding risk factors for pregnancy, it will increase the risk of delivery by cesarean section (Rahmawati, 2018). The researcher's analysis concluded that the higher a person's education level, the more information and knowledge he would get about pregnancy. So that if the woman is pregnant, she will more quickly recognize the danger signs in pregnancy and take into account the risks that might occur in her pregnancy so that it will encourage the decision to give birth spontaneously. *section caesarea*.

Mother's Occupation

Employee is something that must be done, especially to support family life. This is not an indication of the employment relationship with *caesarean section*, but only shows a lack of information/knowledge about the indication *section caesarea*. The majority of mothers experience *caesarean section* at work is a housewife. This is due to a lack of knowledge or receiving information either from the media or from health workers, especially regarding indications *caesarean section* compared to pregnant women who work outside the home (Hijriani, Rahim, & Hengky, 2020).

The researcher's analysis concluded that working women will interact more often with people and have the opportunity to get more information about pregnancy than women who do not work. So that mothers who do not work tend to lack understanding and lack of information in detecting high-risk signs in pregnancy which will cause delays in handling complications of pregnancy that support the occurrence of vaginal delivery *caesarean section*.

Wealth Index

Low and high wealth indexes have different effects on cesarean delivery. Mothers with a low wealth index (quintiles 1 and 2) are affected by childbirth *caesarean section* (SC), while mothers with a high wealth index (quintiles 4 and 5) do not. Mothers with a low wealth index have a 0.89 chance of having a baby *caesarean section* (SC), whereas mothers with a high wealth index are 1.04 times more likely to go into labor *caesarean section*(SC), compared to mothers with

moderate wealth index (quintile 3). A higher wealth index leads to greater opportunities for operations *caesarean section* (SC). The high proportion of cesarean delivery in women with a high wealth index can be caused by the cost of cesarean section which is expensive and requires a more complex level of obstetric care. The cost of cesarean delivery is higher than some incomes, so people with a low wealth index may not be able to afford the higher costs (Lazasni, Machmud, & Ronoatmodjo, 2020).

The researcher's analysis concludes that the higher a person's wealth index will also increase the socio-economic degree, indicating the level of welfare and opportunity to use and receive health services, one of which is vaginal delivery *section caesarea* although it will cost many times more than a normal delivery.

Residence

There is a significant relationship between residence with childbirth *caesarean section* (SC). Results of Sihombing's research *et al* (2017) in Ulfa (2021) said that respondents who live in cities are 1.46 times more likely to have vaginal deliveries *caesarean section* than respondents living in rural areas. This is presumably because respondents who live in cities tend to have easier access to higher and more complete health services if there is a pregnancy complication and can immediately take appropriate delivery measures to save the lives of mothers and babies (Ulfa, 2021).

However, in Ulfa's own research results, it was found that the majority of mothers who gave birth via SC at Karsa Husada Batu General Hospital in 2020 came from Malang Regency, namely the Pujon area where the area is not far from the location of Karsa Husada Batu General Hospital. That way, even though there are many respondents who come from the district, it does not prevent them from getting proper health services because the location of their residence is close to the location of RSU Karsa Husada Batu. The distance between the health care facility and the patient's residence is a major factor in patient selection in utilizing the health care facility (Ulfa, 2021).

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The researcher's analysis concluded that pregnant women who live in cities tend to have easier access to higher and more complete health services if there is a complication during pregnancy *section caesarea*.

Husband's Occupation

Husbands who have jobs with high mobility generally do not have time to accompany their wives in caring for their pregnancies. The higher the mobility of a person, the more likely he is to neglect the health of his family members. Families with higher education will quickly be aware of changes in their family's health. They will immediately seek help from health workers or health service units if an emergency occurs in their family. However, when compared to families with low education, they are generally less responsive when health problems occur in their family members. They can only surrender and will ask for help when their health problems are severe (Rusnawati, 2012).

The researcher's analysis concluded that a husband or partner who has a job will not have free time to take their partner for a pregnancy check-up. However, someone who has a good job will also have a higher education so that if a health problem occurs in his family, he will be more responsive because he has better knowledge about health.

Husband's Education

Husband's high education supports the absorption of good health information, especially about safety and health for mothers giving birth, so that it can be said that husband's education influences the decision regarding the choice of birth place to be carried out by the mother. Husband's education is indirectly related to the level of knowledge and socio-economic level of the family (Arief & Sudikno, 2014).

The results of this study reinforce Adewuyi's research (2019), namely the lack of education of mothers and husbands/partners is significantly associated with low prevalence and also a decreased likelihood of *caesarean section* (SC) which is not indicated. Given that the mother's education did not reach a significant status in the multivariable analysis, the education of the husband/partner still had significance. lack of spousal/partner education is

significantly associated with lower prevalence and reduced likelihood of delivery *caesarean section* (SC) (Adewuyi et al., 2019).

The researcher's analysis concluded that the higher the husband's or partner's education will determine the occupation and economic level of a family. So that the higher the economic level of a family will have a tendency to give birth *section caesarea* because they have the ability to pay and if they have higher education they will have better knowledge regarding health and the actions that must be taken in handling it.

The Type Of Birth

The number of fetuses associated with operative delivery *caesarean section* in Indonesia. Mothers with twin pregnancies (multiple pregnancies) are more at risk for giving birth surgically *caesarean section* compared to mothers with single fetuses. The results of research in America show that the trend is surgical delivery *caesarean section* in multiple pregnancies increases. Furthermore, research in Sragen also shows that multiple pregnancies are more likely to experience operative delivery *caesarean section* compared to single pregnancies (Sihombing, Saptarini, & Putri, 2017).

The researchers' analysis concluded that twin pregnancies or pregnancies with more than one baby increased the risk of spontaneous delivery *section caesarea* because the pregnancy of twins will determine the type of delivery whether it is possible to do vaginal delivery or must be a method *caesarean section*.

History of ANC

Health services for pregnant women must meet a minimum frequency in each trimester, namely once in the first trimester (0-12 weeks' gestation), once in the second trimester (12-24 weeks' gestation), and twice in the third trimester (gestational age). 24 weeks to delivery). The service time standard is recommended to ensure protection for pregnant women and/or the fetus in the form of early detection of risk factors, prevention and early treatment of pregnancy complications (Siahaan, 2018).

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Pregnant women who have poor practice in antenatal care (ANC) will be at greater risk of experiencing labor dystocia as an indication of delivery with *caesarean section* (Rahmawati, 2018).

The researcher's analysis concluded that the number of ANC visits shows the mother's concern for her pregnancy, so the more frequent ANC visits, the pregnancy will be monitored and will detect whether there are complicating factors in the pregnancy or not so that it can avoid pregnancy complications which can pose a risk of delivery *caesarean section*.

Baby Size

Based on WHO, normal baby weight ranges from 2500 grams to 4000 grams. Less than 2500 grams is called LBW, more than 4000 grams is called a giant baby (Handayani, 2019). LBW occurs due to pregnant women experiencing malnutrition, pregnant women have problems emotions during pregnancy, childbirth is done at a gestational age of less than 37 weeks, fetal growth disorders (Intrauterine growth restriction), complications during pregnancy, fetal suffers from a congenital medical condition, baby twins, pregnant women are still young, pregnant women use drugs or drink alcohol alcoholic (Helmi & Rasyid, 2020). The magnitude baby influences the type of delivery. If the baby's body is too large and cannot pass through the pelvis, then the right delivery is by section caesarea (Handayani, 2019).

The researcher's analysis concluded that the size of the baby determines the type of delivery because if the baby's size exceeds the normal size it could become a complication in the delivery process because it cannot pass through the pelvis of the mother due to the size being too large, thus requiring vaginal delivery *caesarean section*.

Health Facilities

The number of section caesarea actions which is quite high and has increased every year deserves attention. This does not only occur in private hospitals but also in government hospitals. In general, in Indonesia, the number **5** of caesarean deliveries in government hospitals is 25% of total deliveries, while

in private hospitals the number is very high, around 30-80% of total **13** deliveries (Ayuningtyas et al., 2018).

The high rate of cesarean delivery in the private sector can be explained by adequate modern medical equipment, specialized care, adequate medical and caregiver staff, demand for partners. It is also possible that some public health institutions are not well equipped to perform cesarean deliveries (Roy et al., 2021).

The researcher's analysis concluded that there were many interested in giving birth *caesarean section* in private health facilities because they can carry out the delivery process without medical indications and can determine when the time of birth, as well as more adequate facilities.

History of Complications of Pregnancy

Pregnancy complications have quite an influence on the incidence *caesarean section*, based on the patient register book shows that complications commonly occur such as breech position, PROM, Severe Preeclampsia, **4** CPD, PPT, large babies, and also failed induction. Complications during pregnancy can also affect delivery, if the delivery is carried out spontaneously by a mother who has pregnancy complications, it will result in quite high risks for the mother and her baby. Appropriate action is needed to **4** anticipate risks that might occur. Pregnancy complications are complications that occur during the pregnancy process or complications that can occur after the mother gives birth such as for example, PROM, Bleeding, Abortion, Preeclampsia and Eclampsia and others that can cause risks to the mother and fetus which will affect the delivery process (Ikhlasih & Riska, 2017).

The researcher's analysis concluded that pregnancies with a history of complications had to give birth spontaneously *caesarean section* in order to minimize complications that will occur in vaginal delivery so that the delivery process *caesarean section* form safer delivery for pregnant women with a history of complications during pregnancy or childbirth.

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History of Miscarriage of Pregnancy

The condition of a high-risk pregnancy is characterized by several things, including a bad obstetric history in the form of a history of abortion, stillbirth or having experienced an act of delivery in a previous delivery. This is included in the condition that there is a potential obstetric emergency. With a history of unfavorable (unhealthy) reproduction, it is possible to cause complications or complications in subsequent pregnancies and ultimately deliver section caesarea (Muhammad, 2016).

The researcher's analysis concluded that a history of miscarriage is a bad obstetric history so that it can cause complications in subsequent pregnancies and can become complications in subsequent deliveries. Until delivery *caesarean section* is a safer delivery option for pregnant women with unfavorable obstetric history and also for pregnant women with a history of complications in pregnancy or childbirth.

CONCLUSION

There is a significant relationship between mother's age, mother's occupation, wealth index, place of residence, personal desire, partner's work, partner's education, type of delivery, history of ANC visits, size of baby, health facilities, history of complications of pregnancy and childbirth, history of miscarriage, history of surgery caesarean section with selection of childbirth with p-value <0.001. And there is no relationship between caesarean section and mother's education with a p-value of 0.862.

The dominant factor that influences women giving birth by caesarean section is the type of delivery with an OR of 2.854 times. Compared with a history of complications of pregnancy and childbirth, it has an OR of 2.120, and maternal age has an OR of 1.425.

SUGGESTION

Society

It is expected that people who go through IVF or pregnancy insemination will carry out the fertilization alone in order to reduce the risk of giving birth spontaneously section caesarea and for women who are already pregnant with twin pregnancies are expected to be more diligent in making visits ante natal

which so that they can better detect the progress of their pregnancy and prevent complications that will later allow vaginal delivery section caesarea.

Health Agencies

It is hoped that health agencies will further reduce the number of deliveries using method *caesarean section* by monitoring private hospitals more so that they only perform vaginal delivery procedures *caesarean section* on the basis of medical indications not on non-medical indications. Furthermore, more health promotion to prospective mothers regarding methods of delivery and the dangers and complications so that each prospective mother can consider and determine the best delivery method for herself, for example spontaneous delivery.

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