Determinants of Cesarean Section Decision in Indonesia: A Systematic Review

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ABSTRACT

Background: Cesarean section delivery should be chosen if there are certain medical indications. However, the trend of childbirth by cesarean section shows a high increase in Indonesia. Complications of childbirth after cesarean section are higher compared to normal childbirth, this condition can endanger the health and safety of the mother and baby. Aims: to determine the determinants of cesarean section decisions in Indonesia. Method: this study is a systematic review using PRISMA, a database search via Google Scholar, PubMed, and ScienceDirect, keywords are adjusted to the topic discussed. Results: 13 articles were reviewed that were relevant to the research topic. Determinants of cesarean section decision are medical indication including age, parity, pregnancy complications (hypertension and pre-eclampsia), history of delivery (cesarean section history), and labor complications (premature rupture of membranes and fetal distress) and by choice (own request) including residence in urban areas and employment. Conclusion: Interventions such as education, counseling, and others using appropriate communication, information, and education media, cooperation, and collaboration with academics and non-government organizations are needed in carrying out interventions.

Keywords: Cesarean section, Delivery, Determinant.

INTRODUCTION

Childbirth is a physiological or medical process in which the fetus developing in a woman's womb is expelled from the mother's body after a certain period of pregnancy. This process involves uterine contractions and other changes in the body to allow the baby to exit through the birth canal (Cunningham et al., 2018). Labor or the birth process carries potential risks for the mother and newborn baby (American College of Obstetricians and Gynecologists, 2019). Two methods can be used: natural or delivery via cesarean section. The Cesarean section method involves surgery to remove the baby from the uterus by making an incision in the abdominal wall and uterus (Pratiwi et al., 2019). Cesarean section is carried out based on medical considerations, such as the presence of conditions such as placenta previa, abnormal position of the fetus at birth, and other factors that have the potential to threaten the lives of both mother and fetus (Cunningham et al., 2018).

The incidence of cesarean section in the birth process continues to increase. Globally, 1 in 5 children (21%) is born by cesarean section (World Health Organization, 2021). Based on data from 121 countries, globally from 1990 to 2014, the average cesarean section rate increased by 12.4%. The highest number of deliveries by cesarean section occurred in Latin America and the Caribbean (40.5%), followed by North America (32.3%), Europe (25%), Asia (19.2%), and Africa (7.3%) (Betrán et al., 2016). According to data compiled by the World Health Organization, the rate of cesarean section in 1990 was 7%, now it has increased to 21%, It is estimated that this number will continue to increase during this decade (World Health Organization, 2021).

Cesarean section shows a high trend in numbers in Indonesia. Based on the 2017 Indonesian Demographic and Health Survey, the percentage of births by cesarean section in Indonesia was 17.2%.

Of the 8,255 births by mothers without pregnancy complications, 13.8% delivered by cesarean section (Yogatama & Budiarti, 2020). The results of the 2018 Indonesian Basic Health Research show that the number of mothers who gave birth by cesarean section was 17.6% (Ministry of Health of the Republic of Indonesia, 2018). The number of mothers who gave birth by cesarean section in Indonesia, based on BPJS Health data, was 21,608 cases. This number is much higher compared to mothers who gave normal birth, 14,112 cases (Ariawan et al., 2022). This fact reflects the increasing popularity of the cesarean section delivery method. This fact reflects the growing popularity of the caesarean section delivery method.

Based on the 2018 Indonesian Basic Health Research data, several common reasons that encourage indications for delivery by cesarean section include transverse or breech fetal position, bleeding problems, convulsions, premature rupture of membranes, prolonged labor, pinched umbilical cord, placenta previa, retained placenta, hypertension, and various other complications (Ministry of Health of the Republic of Indonesia, 2018). There is no medical evidence that definitively supports one method of delivery as the best overall. The choice of delivery method should be based on a case-by-case evaluation or individual condition. Unless there is a clear medical indication requiring delivery by cesarean section, this decision should involve family counselling and consider both the medical indications and family preferences. In this context, a cesarean section will only be taken as an option if there is a medical basis that justifies this (Singh et al., 2018).

Mothers without medical indication for planned cesarean section, the risks of short-term maternal complications were higher with planned cesarean section than with planned vaginal delivery (Dahlquist et al., 2022). Cesarean section is often associated with the incidence of placenta accrete, this condition can increase the risk of bleeding during pregnancy and childbirth which has the potential to be fatal for the mother, as well as increase the chances of premature or preterm birth for the baby (Morlando & Collins, 2020) (Nieto-Calvache et al., 2021).

The decision to choose the right delivery will have a positive impact and can save mother and her baby. However, inappropriate decisions can have a negative impact and endanger mother. Therefore, it is necessary to analyse the determinants of cesarean section decision in Indonesia. The existence of this determinant analysis is expected to be used as a consideration or reference to determine the right intervention.

METHODS

This research is a literature review using PRISMA (Prefered Reporting Items for Systematic Reviews and Meta-Analyses). Database was searched via Google Scholar, PubMed, and ScienceDirect, articles published during the last ten years (2013-2023). Keywords used include "cesarean section", childbirth, influenze or relationship, determinants or factors, and Indonesia. The inclusion criteria set include full text article, research conducted in Indonesia, and published by a reputable journal with at least national accreditation, Sinta 5. Exclusion criteria in this research include systematic review articles, literature reviews, and meta-analyses. After the screening, researching, and reading, thirteen articles obtained that were appropriate to the topic to be discussed, regarding the determinants that contributed to the mother's decision to have a cesarean section in Indonesia.

RESULTS AND DISCUSSION
Table 1. Databases of the Articles.

No.	Authors	Title	Objectives	Method	Finding
1.	(Asta et al., 2023)	Analysis of factors related to childbirth. cesarean section	To analyse Factors related to cesarean section deliveries at Mother and Child	Quantitative Using an analytical survey with cross-sectional	Severe Preeclampsia, fetal distress, premature rupture of membranes will

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			Hospital Muhaya Pangkalpinang in 2020	approach	be at greater risk of giving birth by cesarean section
2.	(Suparmi & Maisya, 2017)	Socio-economic disparities and factors related to cesarean delivery in Indonesia	To determine socio-economic disparities and factors associated with cesarean section deliveries in Indonesia.	Quantitative Using an analytical survey with cross-sectional approach	Maternal age over 35 years and living in urban areas has a greater possibility of having a caesarean section
3.	(Sihombing et al., 2017)	Determinants of cesarean section delivery in Indonesia (Further analysis of 2013 Riskesdas data)	To find out the characteristics of mothers who deliver by cesarean section and the risk factors that accompany the mother during pregnancy and or childbirth	Quantitative Using an analytical survey with cross-sectional approach	Labor complications, parity, maternal age over 35 years, living in urban areas, and pregnancy complications have a greater chance of having a caesarean section
4.	(Suciawati et al., 2023)	Factors related to the decision to cesarean section in pregnant women	To find out the factors related to the decision to have a cesarean section for mothers giving birth at Bhayangkara Hospital, Bogor in 2022	Quantitative Using an analytical survey with cross-sectional approach	Maternal age and parity are related to the decision to have a caesarean section on the mother giving birth
5.	(Ikhlasia & Riska, 2017)	The relationship between pregnancy complications and birth history with procedures cesarean section at Fatimah Hospital Serang	To determine the relationship between pregnancy complications and history of childbirth with events Sectio Caesarea at Fatimah Hospital in Serang in 2017	Quantitative Using an analytical survey with cross-sectional approach	Pregnancy complications and labor history are related to caesarean section
6.	(Yanti et al., 2022)	Analysis of factors related to decision-making for cesarean section delivery	Knowing the factors of mother's education, mother's occupation, mother's husband's support, medical indications, mother's psychology of labor pain, intimate organ beauty, birth myths, mother's age, and parity with the incidence of	Quantitative using an analytical survey with a cross-sectional approach	Maternal employment is related to the incidence of caesarean section

			cesarean section delivery in Banda Aceh City in 2018		
7.	(Fristika, 2023)	1. Analysis of factors related to cesarean section delivery at Bhayangkara Hospital (Moh. Hasan) Palembang in 2022	Analysing factors related to cesarean section delivery	Quantitative Using an analytical survey with cross-sectional approach	Severe pre-eclampsia, history of caesarean section delivery, and premature rupture of membranes are associated with caesarean section
8.	(Emma et al., 2020)	Analysis of factors related to cesarean section at the Regional General Hospital "Dr. H. Moch. Ansari Saleh" Banjarmasin in 2019	Analysed the relationship between maternal age, parity, pregnancy complications, birth complications, and health insurance with cesarean section	Observational analytics with a retrospective case-control approach	Maternal age has the most dominant relationship with cesarean section
9.	(Sudarsih et al., 2023)	The relationship between pregnancy complications and childbirth history on cesarean section procedures	To determine the relationship between pregnancy complications and birth history with cesarean section procedures at Medika Stannia Sungailiat Hospital in 2023	Quantitative Using an analytical survey with cross-sectional approach	Pregnancy complications and birth history related to cesarean section
10.	(Dila et al., 2022)	Factors associated with cesarean section delivery in the period 1 January-December 2019 at Bandung Medan General Hospital	to find out (age, parity, birth history, non-progressing labor, premature rupture of membranes) related to cesarean section delivery at the Bandung Medan General Hospital for the period 1 January – December 2019	Mix Methods	Birth history, maternal age, and parity are related to cesarean section
11.	(Yuhana et al., 2022)	The relationship between premature rupture of membranes, prolonged labor, and fetal distress with caesarean section delivery at Dr. Noesmir Baturaja	To determine the relationship between premature rupture of membranes, prolonged labor, and fetal distress with caesarean section delivery at Dr. Noesmir Baturaja	Quantitative using an analytical survey with cross-sectional approach	Premature rupture of membranes and fetal distress are related to cesarean section

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		Hospital TK. IV in 2020	Hospital TK. IV in 2020		
12.	(Permatasari et al., 2022)	Factors associated with the incidence of caesarean section	To determine the relationship between premature rupture of membranes, cesarean section history, and pre-eclampsia with the incidence of caesarean section at the Muhammadiyah Hospital in Palembang in 2021	Quantitative using an analytical survey with cross-sectional approach	Premature rupture of membranes, cesarean section history, and pre-eclampsia are related to cesarean section incidence
13.	(Helmi & Rasyid, 2020)	Determinant of cesarean section delivery on birth mother in a hospital in Pekanbaru City	To know the determinants associated with cesarean section delivery	Quantitative using an analytical survey with cross-sectional approach	There is a relationship between premature rupture of membranes and hypertension with cesarean section delivery

Based on the thirteen articles found, there are various determinants related to the cesarean section decision in Indonesia. The most frequent determinants are due to medical indications including age, parity, pregnancy complications (pre-eclampsia), and birth history (cesarean section history), and labor complicatios (premature rupture of membranes and fetal distress). The other most common determining factor, cesarean section by choice (own request), includes residence in urban areas. Then there are several other determining factors based on medical indications, pregnancy complications (hypertension) and by choice (own request), employment.

Determinants based on medical indication

1. Age

Maternal age is related to the mother's decision to choose to give birth by cesarean section (Dunn et al., 2017) (Ashar & Kusrini, 2020). Mothers aged <20 years tend to have reproductive organs that do not yet function perfectly, so if pregnancy occurs it will be easier for them to experience complications. The strength of the perineum and abdominal muscles are not functioning optimally, this is the cause of prolonged or obstructed labor, requiring cesarean section during delivery. Meanwhile, mothers aged >35 years will be at risk of experiencing congenital abnormalities and complications during childbirth because the muscle tissue of the uterus is not able to accept pregnancy well, thus requiring a cesarean section during delivery. Mothers aged <20 years and >35 years are 3 times more likely to experience a difficult birth than mothers aged 20-35 years (Murray & Huelsmann, 2013).

2. Parity

Parity is related to the mother's decision to choose to give birth by cesarean section (Amir & Yulianti, 2020). The study conducted by Tebeu et al. (2011) showed that grand multiparas in Cameroon are at high risk of undergoing cesarean section during delivery. First parity and Grande multipara have a higher risk of maternal mortality. This is related to the level of maturity and decreased function of the organs involved in the birthing process. In general, having a history of more than one pregnancy (multigravida) is a condition that is safer for a mother during childbirth and tends to be included in the category of low-risk pregnancy.

However, it should be noted that there are still risk factors that can increase the likelihood of complications in the delivery process which can result in danger to the health and safety of the mother and baby. For example, mothers who are grand multigravidas and have had unsuccessful pregnancies, delivered with the help of a vacuum device, required blood transfusions, experienced retained placenta, or had a history of cesarean section in previous births (Prawirohardjo, 2016).

3. **Pregnancy complications**

Mothers who experience complications during pregnancy tend to choose delivery via cesarean section than mothers who do not face pregnancy problems (Sudarsih & Agustin, 2023) (Gonzales et al., 2013).

a. **Hypertension**

Hypertension is one of the indicative symptoms of pre-eclampsia. According to The American College of Obstretician and Gynecologists (2019), hypertension usually appears after 20 weeks of gestation or in the third trimester of pregnancy, especially at around 37 weekf of gestation. Signs of hypertension in pregnant woman include swelling of the feet, hands, and face, as well as an increase in blood pressure to reach or exceed 140/90 mmHg. Pre-eclampsia can progress from mild to severe, and in more severe cases, can progress to eclampsia. Hypertension associated with pre-eclampsia and eclampsia often requires the selection of delivery by caesarean section as the recommended medical procedure.

b. **Pre-eclampsia**

Mothers who experience pre-eclampsia have a higher chance of having a cesarean delivery than giving birth normally (Gonzales et al., 2013). Severe pre-eclampsia and eclampsia have the potential to cause problems for the mother and fetus. To prevent this, the action taken is to terminate the pregnancy as soon as possible. Induction of labor or even a cesarean section can be a prophylactic step to end a pregnancy to ensure the safety of the mother and fetus (Manuaba et al., 2010).

4. **Birth history (Cesarean section history)**

A history of giving birth by cesarean section influences the decision to give birth by cesarean section in a government hospital (Qudrotunanda & Chamid, 2023). Mothers who have experience giving birth by cesarean section will have the opportunity to give birth by cesarean section in their next pregnancy because the vertical incision of the stomach and uterus risks causing tearing of the uterus (Fajrini, 2016). A history of delivery by cesarean section is known to be associated with the incidence of premature rupture of membranes (Assefa et al., 2018).

5. **Labor complications**

a. **Fetal distress**

Fetal distress is related to the choice of cesarean section (Rosyati, 2022). An emergency in the fetus is the reason for carrying out a cesarean section to save the baby's life (Oxorn & Forte, 2010) (Gangwar & Chaudhary, 2016). Fetal distress refers to disturbances in the condition of the fetus that produce pathological levels of stress, and with the potential to carry a risk of death for the fetus (Lockhart & Saputra, 2014).

b. **Premature rupture of membranes (PROM)**

Premature rupture of membranes (PROM) can pose a risk of harm to the mother, fetus, and baby being born. The impact is that it causes complications, and the worst impact is that maternal and fetal death can occur. Mothers with premature rupture of membranes will have a higher chance of giving birth by cesarean section (Gibbs et al., 2010) (Gabbe et al., 2007). Conditions Mothers who experience premature rupture of membranes will have a 19.194 times chance of delivering by cesarean section compared to mothers who do not experience premature rupture of membranes (Ameliah et al., 2022). Premature

rupture of membranes during labor is associated with an increased risk of selecting a cesarean section.

Determinants based on choice (own request)

1. Place of residence

The living environment (urban or rural) also has an impact on the decision to give birth by cesarean section. The trend of giving birth by cesarean section for mothers living in urban areas is higher than for mothers living in rural areas (Zahroh et al., 2020). Based on the 2018 Riskesdas (Basic Health Research) data analysis, mothers who have the potential to undergo cesarean section are those who live in urban areas, have a higher level of education such as diploma 3 or tertiary graduates, have high economic status (in the highest category), and work in the formal sector as a private employee (Ministry of Health of the Republic of Indonesia, 2018).

2. Employment

Mothers who work and have higher education prefer to give birth by cesarean section (Suparmi & Maisya, 2017). This factor is likely because employment status is often related to socioeconomic status, which can have a significant impact on preferences for health services. Women who have careers tend to have economic independence because they have personal income. In addition, mothers who have a higher educational background tend to have broader knowledge, so they can make their own decisions regarding the birth process (Suparmi & Maisya, 2017). Such conditions can encourage mothers to choose cesarean section as an option, especially if they have a deadline to follow giving birth, such as having to return to work within a certain time. Situations like this significantly increase the chances of delivery via cesarean section, especially in working mothers.

Analysis of the determinants of the cesarean section decision based on behavioral theory

A decision or action to behave can affect the health status of an individual or society. According to Dahlgren and Whitehead, the existence of social determinants of health can influence behavior (Dahlgren & Whitehead, 2021). Social determinants of health are non-medical factors that influence the health status or outcomes of individuals and communities (World Health Organization, 2011). Based on the articles found, age, parity, and employment are several factors that influence the decision to choose a cesarean section. A cesarean section has the potential to be performed if the mother's age is at risk (35 years and above), the higher the mother's age, the higher the risk of cesarean section (Faisal-Curyl et al., 2017) (Rydahl et al., 2019). Obstetric factors such as age and parity can increase the risk of choosing a cesarean section (Elnakib et al., 2019). Working mothers are known to give birth more often by cesarean section (Khojasteh et al., 2016). Working mothers have the potential to experience work stress and this will be at risk of causing pregnancy complications, pre-eclampsia. So, this condition will be an indication for a cesarean section. Pre-eclampsia cases are one of the biggest reasons for cesarean section (Sukmawati et al., 2020). In other conditions, working mothers will choose to give birth by cesarean section for several reasons, for example, work schedules, access to leave and prenatal care, and so on. So according to some women, caesarean section is considered the right solution.

According to social learning theory, a person's behavior is the result of observation, imitation, and interaction with their social environment (Bandura, 1977). Based on the articles found, the factor of residence in urban areas is a determinant in choosing a cesarean section delivery. Delivery by cesarean section has become a trend in urban areas (Giang et al., 2022). The results of basic Indonesian health research in 2018 show that mothers who live in urban environments are more likely to give birth by cesarean section (22.1%) than mothers who live in rural areas (12.4%) (Ministry of Health of the Republic of Indonesia, 2018). If it is related to social learning theory, the living environment plays an important role in influencing the decision to give birth by cesarean section. Mother saw that in the surrounding environment, there were many who gave birth by cesarean section, apart from that the factors of ease of

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access and economic level also supported this. Mothers who live in urban areas tend to have more cesarean section deliveries than mothers who live in rural areas (Islam et al., 2022).

CONCLUSION

Based on the results of a literature study conducted, it can be concluded that the determinants of cesarean section decision in Indonesia are due to medical indication including age, parity, pregnancy complications (hypertension and pre-eclampsia), history of delivery (caesarean section history), and labor complicatios (premature rupture of membranes and fetal distress) and by choice (own request) including residence in urban areas and employment. It is recommended for health workers to provide interventions such as education, counselling, etc. to mothers and their husbands and families regarding childbirth, including conditions that require mothers to choose to give birth by cesarean section using appropriate communication, information, and education media. Health workers should partner and with other parties such as academics or non-government organizations (NGOs) to help provide the intervention.

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