

**RESEARCH ARTICLE****Relationship of Determinant Factors to Severity Level of Caesarean Section Based on The INA-CBGs System at Dr. M. Djamil Padang**Fauzi Ahmad Hasibuan¹, Aladin^{1,*}, Husna Yetti²¹ Sub Division of Social Obstetrics and Gynecology, Obstetrics and Gynecology Department, Faculty of Medicine, Andalas University, Padang, West Sumatera, Indonesia² Department of Public Health and Community Medicine, Faculty of Medicine, Andalas University, Padang, West Sumatera, Indonesia**Corresponding Author:** Aladin; aladin@med.unand.ac.id; +62 812-6606-583**Received :** October 3, 2024; **Accepted:** January 6, 2025; **Published:** January 22, 2025**Doi :** <https://doi.org/10.25077/aoj.9.1.23-29.2025>**Abstract**

Introduction: Cesarean deliveries are increasing worldwide and now account for one fifth (21%) of all deliveries. This has exceeded the standard for caesarean section operations by WHO by around 5-15%. In Indonesia cesarean delivery rate was 17.6% percent with the highest proportion in DKI Jakarta (31.1%), the lowest in Papua (3.3%). West Sumatra is ranked second highest with a caesarean section rate of 23.8%.

Objective: To determine the relationship between age, education, employment, nutritional status, number of ANC's, underlying diseases, and the severity of caesarean section.

Method: This research is an observational analytical design with a cross-sectional approach. It aims to relate the relationship between age, education, employment, nutritional status, number of ANC's, and underlying diseases, and the severity of caesarean section.

Results: This study had 400 research subjects who underwent caesarean section operations, with 16 research subjects experiencing caesarean sections with severe severity, 276 research subjects experiencing moderate severity, and 108 research subjects experiencing mild severity. Using the Chi-Square correlation test, there was significant relationship between a history of ANC and the history of underlying disease on the severity of caesarean section. There was no significant relationship between age, education, employment, or nutritional status on the severity of caesarean section.

Conclusion: There was significant relationship between history of ANC and history of underlying disease on the severity of caesarean section.

Keywords: Determinant Factors, Cesarean section, Level severity, INA-CBGs

INTRODUCTION

WHO states that the standard of cesarean section is around 5-15%. WHO data shows that 46.1% of all births are via cesarean section.⁴⁻⁶ According to WHO data in 2018 from 150 countries, currently 18.6% of all births occur via cesarean section, ranging from 1.4% to 56.4% Latin America and the Caribbean currently have the highest cesarean section rate (40.5%), followed by North America (32.3%), Oceania (31.1%), Europe (25%), Asia (19.2%) and Africa (7.3%). Trend analysis based on data from 121 countries showed that between 1990 and 2014, the global average cesarean section rate almost tripled (from 6.7% to 19.1%) with an average annual increase of 4.4%. The largest absolute increase occurred in Latin America and the Caribbean (percentage from 22.8% to 42.2%), followed by Asia (from 4.4% to 19.5%), Oceania (from 18.5% to 32.6%), Europe (from 11.2% to 25%), North America (from 22.3% to 32.3%) and Africa (with from 2.9% to 7.4%).⁷⁻⁹

The WHO states that cesarean section deliveries are increasing worldwide and now account for one-fifth (21%) of all deliveries. Studies suggest that the number will continue to grow over the next decade, with nearly one-third (29%) of all births expected to occur by cesarean section by 2030.

In Indonesia, the 2018 Riskesdas results show a cesarean delivery rate of 17.6% percent with the highest proportion in DKI Jakarta (31.1%), the lowest in Papua (3.3%). West Sumatra ranked second highest with a cesarean section rate of 23.8% in Indonesia.¹⁰⁻¹¹

Based on data obtained from Dr. M. Djamil General Hospital in 2010 the case of cesarean section delivery was 465 deliveries. In 2011 there was an increase of 527 cases of cesarean delivery. In 2013 the cases of cesarean delivery increased even more, as many as 732 cases.¹²

Several studies have suggested that the risk factors for cesarean delivery are service, demographic, and socioeconomic factors. Cesarean delivery itself is significantly associated with multiple pregnancies, maternal age, history of previous cesarean delivery, socioeconomic status, and access to antenatal care (ANC) services. Some maternal characteristics such as education, and access to ANC services are also associated with cesarean section and can increase the incidence of cesarean section.¹³ One study showed that mothers aged less than 17 years and aged >39 years had a 3 times and 0.75 times higher risk of cesarean section than those aged 20-29 years.¹⁴ Cesarean section is used as a solution when normal delivery is not possible due to specific medical reasons. Therefore, it is important to understand that cesarean section delivery is an alternative to delivery when normal delivery is not possible due to specific medical reasons.¹⁶

Some previous studies on the importance of analyzing the factors that influence a mother's choice to have a cesarean delivery include a study conducted by RA Mendoza in Brazil in 2010 that showed the importance of analyzing risk factors for cesarean delivery using specific categories provided by health care providers to anticipate the increasing ratio of cesarean deliveries without medical indications in Brazil.¹⁷

Indonesia Case Based Groups (INA-CBG) groupings are based on internationally accepted diagnosis and action codes, namely ICD-10 and ICD-9-CM revised in 2010. In ICD-10 there are approximately 14,500 diagnosis codes and in ICD-9-CM there are approximately 7,500

procedure/action codes. After the codes are inputted, the INA-CBG software system will group the codes into one of 1,075 case groups. INA-CBG software called E-claim INA-CBG is a tool used to group diagnoses based on data entry of diagnostic and action codes obtained in medical records. Currently, the running version is version 5.6. To use this software, hospitals must have a hospital registration code issued by the Directorate General of Health Services, then the INA-CBG software will be activated according to the type of hospital and its regionalization by the Center for Health Financing and Decentralization Policy (Pusjak PDK) of the Indonesian Ministry of Health. The software will group diagnoses and actions, so that the codes (O-6-10-I, O-6-10-II, O-6-10-III) and INA-CBG rates appear, and from these values, the severity of cesarean section will be obtained. The division of the degree of cesarean section is important for health workers to be able to screen during pregnancy by looking at the determinant factors that exist in pregnant women to provide appropriate treatment when there are indications of cesarean delivery, with the more severe the severity of the action will increase the risk of intra- and postoperative complications. The severity of cesarean section will also affect the unit cost in the claim procedure with BPJS.

METHODS

This study is an analytical research design with a cross-sectional approach that aims to relate the relationship between age, education, occupation, nutritional status, number of ANC, and comorbidities to the severity of cesarean section. Observational research is research in which the researcher only makes observations without intervening in the research subject. Analytic is a study that explores how and why health phenomena occur. The population in this study were all pregnant patients who gave birth by cesarean section method at RUSP M Djamil Padang in 2023, totaling 400 cases. The sampling technique is reached by the total sampling method. In total sampling, a sampling method in which the number of samples is the same as the total population. The research data was taken through observation of medical record data of Dr. M. Djamil Padang Hospital. The research was conducted after passing ethical tests and obtaining research permission from the Education and Training Department of Dr. M. Djamil Padang Hospital.

RESULT AND DISCUSSION

An analytical study with a hospital-based cross-sectional design was conducted by taking data from the registry of patients who underwent cesarean section surgery at M. Djamil Central General Hospital Padang in the period January to December 2023. This study aimed to analyze the relationship of age, education, occupation, nutritional status, number of ANC, and comorbidities to the severity of cesarean section.

This study obtained a total of 400 research subjects who underwent cesarean section surgery, with 292 research subjects experiencing moderate severity, and 108 research subjects experiencing mild severity. After obtaining the data, descriptive analysis was conducted on each research variable. Then a bivariate correlation test was conducted to assess the relationship of the independent variables, namely age, education, occupation, nutritional status, number of ANC, and comorbidities to the dependent variable, namely the severity of cesarean section.

The subjects of this study were more dominated by antenatal care checks that were not following the recommendations of Permenkes 21 of 2021 because they were dominated by groups who underwent less than 6 checks and or did not conduct antenatal care checks with a doctor or specialist. Statistical analysis found a significant relationship between the two. It can be said that ANC checks following Permenkes 21 of 2021 in pregnant women in this study reduced by 2.7 times the risk of a heavier degree of severity in cesarean section. total of 1470 patients. The results of research by Andayasari, Lelly et al. (2011) amounted to 85.2% in one government hospital and one private hospital in Jakarta.¹⁹

The highest fetal indication in this study was malposition with a percentage of 42.1%. Based on the results of research conducted by Latifah in 2020, the highest fetal indication was malposition at 20.2%. The results of research by Andayasari, Lelly et al. (2011) amounted to 37.8% in one government hospital and one private hospital in Jakarta.¹⁹ A study conducted by Islam et al in 2022, found that antenatal care (ANC) visits were significantly positively associated with receiving cesarean section; mothers with more than four ANC visits (aOR = 4.54) tended to receive more cesarean sections than mothers without ANC visits.²⁰ An analysis in Indonesia (2013) has shown that delivery complications, parity, and maternal and fetal health status are variables associated with greater utilization of cesarean delivery.²¹ Respondents from urban areas were more likely to receive cesarean delivery than those from rural areas, thus supporting findings from other studies. Increased access to internet facilities, maternal age, and access to private insurance have increased the likelihood of planned cesarean section among Indonesian women.²² There is an increased risk of neonatal mortality with planned early delivery compared to expectant management in women with PPROM, an increased risk of perinatal mortality with reduced antenatal visit programs compared to standard care, and an increased risk of maternal adverse events with mifepristone compared to placebo, although these are mainly minor gastro-intestinal disturbances (nausea, diarrhea and vomiting).

A study conducted by Islam et al in 2022, found that antenatal care (ANC) visits were significantly positively associated with cesarean section; mothers who had more than four ANC visits (aOR = 4.54) tended to have more cesarean sections compared to mothers who did not have any ANC visits.²⁰ An analysis in Indonesia (2013) showed that labor complications, parity, and maternal and fetal health status were variables associated with greater use of cesarean sections.²¹ Respondents from urban areas were more likely to have cesarean sections compared to those from rural areas, and this supports findings from other studies. Increased access to internet facilities, maternal age, and access to private insurance have increased the likelihood of planned caesarean section among Indonesian women.²² There was an increased risk of neonatal death in planned early delivery compared with expectant management in women with PPROM, an increased risk of perinatal death in the fewer antenatal visits program compared with standard care, and an increased risk of maternal side effects in mifepristone compared with placebo, although these were mainly gastrointestinal disturbances (nausea, diarrhoea, and vomiting).

A small proportion of the subjects in this study had comorbidities, and most patients did not have comorbidities. There was a significant correlation between comorbidities in the subjects and

the severity of cesarean section. Mothers with a history of comorbidities were 0.42 times more likely to have a more severe cesarean section. The literature suggests that the risk of complications in emergency cesarean section is greater than elective cesarean section (RR 1.1 - 2.5) in many studies. For severe maternal morbidity, the OR was 2.3 for elective cesarean section and 2.0 for intrapartum cesarean section versus Vd, when adjusted for parity, any comorbidities before or during pregnancy, hypertensive disorders, bleeding in the second half of pregnancy, IUGR and other medical conditions in a large study from eight Latin American countries.²³ The degree of cervical dilatation was linearly related to the level of maternal complications, with a total complication rate of 4% at 0 cm and 19.1% at 9-10 cm. Over the past several decades, maternal age, obesity, and the frequency of other comorbidities have increased among first-time mothers.^{24,25} In particular, the prevalence of hypertension, diabetes, thyroid disorders, autoimmune disorders, asthma, and mental health conditions has increased substantially.^{26,27} In addition, certain neurologic and cardiac conditions that were once considered rare or incompatible with pregnancy are now seen with increasing frequency in pregnant patients.²⁸ Complex risk adjustment will be required to compare rates across institutions.²⁹ Target rates set by health care quality organizations are often arbitrary and do not take into account differences in patient characteristics. Based on these findings, we would expect that cesarean delivery rates would be higher in populations with more comorbidities, regardless of whether cesarean delivery is indicated. The goal for such populations should be simultaneous efforts to reduce both comorbidities and cesarean delivery.

CONCLUSION

Based on the results and discussion of this study, it can be concluded that, the distribution of the severity of cesarean sections at RSUP M Djamil Padang in 2023 was dominated by moderate degrees of 73% (292), while mild degrees were 27% (108). The most common indication for mothers undergoing cesarean sections was a history of cesarean sections with a percentage of 26.7%. The age of mothers in this study was dominated by reproductive age which was included in the non-high-risk category, namely 20-35 years, with a percentage of 67% (268). Most of the subjects in this study had completed formal education with a percentage of 60.5% (242). This study was dominated by research subjects who did not work with a percentage of 81.1% (324). The nutritional status in this study was mostly in the normal category of 66.3% (265). The number of ANCs obtained 50.3% (201) did not comply with the Minister of Health Regulation, while 49.8% (199) carried out ANC according to the Minister of Health Regulation. 274 of the study subjects did not have comorbidities, while 31.5% (126) had one or more comorbidities. There was no significant relationship between maternal age and the severity of cesarean section. There was a significant relationship between the number of ANCs and the severity of cesarean section. There was a significant relationship between comorbidities and the severity of cesarean section.

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