

# Factors associated with cesarean delivery in adult nulliparous women

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**ABSTRACT.** The aim of this study was to analyze the sociodemographic factors associated with cesarean section in adult women with conditions favorable for normal delivery and to identify the groups most likely to undergo this surgery in the state of Santa Catarina (SC). A case control study with microdata from the Sistema de Informação de Nascidos Vivos on 7,065 women for 2016 in SC. A relationship between cesarean section and sociodemographic variables was analyzed by logistic regression where we calculated the Adjusted Odds Ratio (AOR), confidence interval and p-value. The probability of cesarean section for each group of women (called "interaction") was also calculated. Among women with more favorable conditions for normal childbirth, the prevalence of cesarean section was 41.1%. Lower chance of cesarean section was found for women without partners (AOR: 0.79 [0.71-0.87]), up to 8 years of schooling (AOR: 0.56 [0.47-0.66]), with up to 2 prenatal visits (AOR: 0.46 [0.23-0.90]). The most likely group of women (51.4% [49.3-53.4]) to undergo cesarean section are women who perform 7 to 15 prenatal visits and have 12 or more years of schooling. A cesarean section occurs with women who have greater access to education and prenatal care and those who have partners, even though the aspects favor normal childbirth, suggesting that this does not seem to be a decision only by women.

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## Introduction

Cesarean surgery emerged as a medical necessity and decreased mortality rates and the occurrence of neonatal and maternal sequelae (Souza et al., 2018). It is an effective alternative to preserve the lives of women and children and should be performed under clinical indications, given the significant risk of adverse outcome (Lavender, Hofmeyr, Neilson, Kingdon, & Gyte, 2012; Brasil, 2015).

Although the main recommendations for performing cesarean sections are described in the literature, the issues that contribute to high cesarean rates are multifactorial, complex and still remain poorly explained (Panda, Begley, & Daly, 2018).

Issues such as social, demographic, cultural and economic factors of pregnant women, related to the care model, aspects of medical work and other professionals can influence the decision for cesarean section, even when there are favorable conditions for vaginal delivery (Patah & Malik, 2011).

The number of cesarean sections has increased and has been the focus of scientific interest due to potential maternal and perinatal risks, cost issues and inequality in access (Kirchengast & Hartmann, 2018).

The average global cesarean rate of 18.6% varies between different regions. South America has the highest average cesarean rates in the world (42.9%). The countries with the highest rates of cesarean sections in Latin America and the Caribbean are Brazil (55.6%) and the Dominican Republic (56.4%), Egypt (51.8%) in Africa, Iran and Turkey in Asia (47.9% and 47.5%, respectively), Italy (38.1%) in Europe, the United States (32.8%) in North America and New Zealand (33.4%) in Oceania (Betrán, Zhang, Gülmezoglu, & Torloni, 2016).

C-section rates were higher than the recommendations of the World Health Organization (Organização Mundial da Saúde (OMS), 2015), which in the last 30 years has considered an ideal between 10% and 15% of all births.

In 2016, Brazil had a percentage of cesarean births of 55.4% (Brasil, 2019) being one of the countries with the highest rate of cesarean sections in the world, which indicates the degree of hyper-medicalization of maternity of the country (Souza & Pileggi-Castro, 2014). Although there are variations between Brazilian

regions, in the case of the state of Santa Catarina, in the same year, the percentage of cesarean sections was 58.3% (Brasil, 2019) and was close to the national average.

Public policies should focus on ensuring that cesarean sections are performed in cases where they are necessary considering that at the population level, cesarean rates greater than 10% are not associated with a reduction in maternal and neonatal mortality; they can cause complications, sequelae or death, especially in places without infrastructure and/or the capacity to perform surgeries safely and to treat postoperative complications (OMS, 2015). Despite this, in 2016 in Brazil, the proportion of cesarean sections in group 1 was 44.8%, and in Santa Catarina, 36.1% (Brasil, 2019).

One of the focuses of Brazilian public policies to reduce cesarean sections should be directed at nulliparous women, through the reduction of elective cesarean sections performed in this group of women, considering that the first experience may influence the subsequent type of delivery (Nakamura-Pereira et al., 2016).

The importance and need to intervene with nulliparous women to reduce cesarean delivery, scarcity of studies with this specific group and the importance of knowing the sociodemographic factors that can lead to a cesarean delivery among women with more favorable conditions for normal childbirth motivated the present study. The objective of this study was to analyze the sociodemographic factors associated with cesarean sections among adult nulliparous women with conditions more favorable for vaginal delivery and to identify the groups most likely to undergo this surgery in the state of Santa Catarina.

## Material and methods

This was a case control study using microdata from the Live Birth Information System (SINASC) in 2016 for the state of Santa Catarina (SC).

These microdata are the unidentified individual records of live births in Brazil made available by the SUS Computer Department (DATASUS). The choice of only one state was due to maintaining contextual homogeneity and access to health services. Santa Catarina has coverage of 100% health regions with agreements in the Cegonha Network, which is the obstetric and neonatal care network and which provides for a change in the care model.

The population of this study was composed of women with possibly more favorable conditions for vaginal childbirth, which are those classified in Robson's group 1 and who met the following inclusion criteria: age range 20 to 34 years; newborn without anomalies, weighing between 2,500g and 3,999g. 'Cases' were considered to be those that met the above criteria and underwent cesarean surgery; and 'controls' were those who underwent vaginal delivery.

The Robson Classification is an instrument for the evaluation, monitoring and comparison of cesarean rates over time in the same hospital and between different hospitals. This classification uses five concepts (obstetric history, number of fetuses, fetal presentation, onset of labor, gestational age) to classify pregnant women into 10 groups on admission (OMS, 2015). Robson's group 1 includes nulliparous women with characteristics typical of the pregnant woman's usual risk, with a single fetus, cephalic presentation and gestation  $\geq 37$  weeks and, therefore, presents characteristics more favorable for vaginal delivery (Entringer, Pinto, Dias, & Gomes, 2018).

Criteria of Robson's group 1 were reapplied in the independent variables, in order to exclude possible inconsistencies and incompleteness in the database. In order to avoid selection bias, births performed outside the hospital environment, assisted by a non-medical professional and with a number of visits greater than or equal to 16, were excluded, considering that a pregnant woman undergoing a high number of visits may present some condition during pregnancy in which cesarean section is recommended, and this condition is not included in the Declaration of Live Birth, source of data for this study.

The variables used to analyze the sociodemographic characteristics were the number of prenatal visits performed, race, education and marital status of women. After applying all the inclusion and exclusion criteria in the database available for Santa Catarina in 2016, the population set for the study was 7,065, including 2,906 cases and 4,159 controls.

Prior to data analysis, the collinearity of variables was checked by the Spearman test, with no variable being collinear. To estimate the adjusted odds ratio (AOR) between the variables of sociodemographic exposure, we used the logistic regression, presenting its 95% confidence interval (CI) and the P-value obtained by the Chi-square test. The probability of each group of women also performing a Cesarean section (called

‘interaction’) was also calculated. Groups were created by combining the independent variables used in the study, which are: race, number of prenatal visits, marital status and schooling in years of study, and were presented in percentages, with their respective CIs.

To check the predictive value of the logistic regression model built by forward selection, the ROC curve was used, whose result was 57.8%, in addition to its distribution of residuals, whose density varied from approximately -3 to 3; both considered acceptable. Data were analyzed in STATA/SE 14.2.

## Results and discussion

In 2016, the prevalence of cesarean sections among live births in Santa Catarina was 57.6%, while in the records selected for the present study it was 41.1%, with the ratio of cesarean sections to vaginal childbirths equal to 1: 1.4 and the difference between the two relative frequencies, 16.5%.

Most women with characteristics more favorable for vaginal childbirth did so. There was a higher prevalence of cesarean sections in white women (41.7%); women with a partner (43.6%); 12 or more years of study (49.4%); and 7 or more prenatal visits (41.9%). In those who had only 1 or 2 prenatal visits, the prevalence was 21.6%; among non-whites the prevalence was 36.2%; values close to the percentages observed among those women without partners and with less than 8 years of study (36.1% and 33.8%, respectively) (Table 1).

Women who do not have a partner had a 79% chance of undergoing a cesarean section (AOR: 0.79 [0.71-0.87]) compared to those who have a partner. Those with less than 12 years of study also had less chance of undergoing a cesarean section, 44% less for those up to 8 years old (AOR: 0.56 [0.47-0.66]) and 38% less for those who have 9 to 11 years of study (AOR: 0.62 [0.56-0.69]). Pregnant women who had less than 7 prenatal visits were also less likely to have a cesarean section, and those with 1 or 2 prenatal visits had 54% (AOR: 0.46 [0.23-0.90]) lower chance to do so (Table 1).

**Table 1.** Sociodemographic factors associated with cesarean section in adult nulliparous women with conditions more favorable for vaginal childbirth. Santa Catarina, 2016.

Variables	Cesarean (2,906 cases)		Vaginal delivery (4,159 controls)		AOR	95% CI	p-value
	n	%	n	%			
Race							
Non-white	255	36.2	449	63.8	0.92	078-1.08	0.307
White	2.651	41.7	3.710	58.3	1.00		
Marital status							
No partner	851	36.1	1.505	63.9	0.79	071-0.87	< 0.05
With partner	2.055	43.6	2.654	56.4	1.00		
Education**							
Up to 8 years	266	33.8	520	66.2	0.56	0.47-0.66	< 0.05
9 to 11 years	1.348	36.8	2.313	63.2	0.62	0.56-0.69	< 0.05
12 or more years	1.292	49.4	1.326	50.6	1.00		
Prenatal							
1 to 2 visits	11	21.6	40	78.4	0.46	0.23-0.90	< 0.05
3 to 6 visits	434	37.8	713	62.2	0.90	0.79-1.02	0.12
and more visits	2.461	41.9	3.406	58.1	1.00		

\*AOR: Adjusted Odds Ratio; \*\*in years of study

The women most likely (51.4% [49.3-53.4]) to have a cesarean section, despite the conditions favorable for vaginal delivery, are white women who had 7 to 15 prenatal visits, with a partner and 12 or more years of study. Those women with a partner and higher education, with variation in race and number of visits, are also more than 45% likely to have a cesarean section.

In contrast, non-white women, with 1 or 2 prenatal visits, without a partner and with schooling up to 8 years of study, have the least chance of having a cesarean section (16.3% [6.9-25.8]). Probabilities below 20% were found among women who had 1 or 2 prenatal visits and did not have a partner, less education and regardless of race (Table 2).

Cesarean section is one of the health technologies most frequently used unnecessarily (Souza & Pileggi-Castro, 2014). Undoubtedly, it is a surgical intervention that brings benefits to women and children in specific health risk situations, however, when used indiscriminately and unnecessarily, its beneficial potential decreases and may even lead to additional risks for women and children (Souza & Pileggi-Castro, 2014; Mascarello, Horta, & Silveira, 2017).

**Table 2.** Probability and 95% confidence interval of having a cesarean section according to group. Santa Catarina, 2016

Group*	Probability (%)	95% CI
White # 7to15 # with a partner # >=12	51.4	49.3- 53.4
Non-white # 7to15 # with a partner # >=12	49.2	44.8-53-7
White # 3to6 # with a partner # >=12	48.7	45.2-52.3
Non-white # 3to6 # with a partner # >=12	46.6	41.4-51.8
White # 7to15 # without a partner # >=12	45.4	42.6-48.2
Non-white # 7to5 # without a partner # >=12	43.3	38.6-48.0
White # 3to6 # without a partner # >=12	42.8	39.0-46.6
Non-white # 3to6 # without a partner # >=12	40.7	35.5-46.0
White # 7to15 # with a partner # 9-11	39.7	37.7-41.6
Non-white # 7to15 # with a partner # 9-11	37.6	33.7-41.6
White # 3to6 # with a partner # 9-11	37.2	34.0-40.4
White # 7to15 # with a partner # up to 8	37.2	33.5-40.9
Non-white # 3to6 # with a partner # 9-11	35.2	30.7-39.7
Non-white # 7to15 # with a partner # up to 8	35.2	30.4-39.9
White # 3to6 # with a partner # up to 8	34.7	30.5-39.0
White # 7to15 # without a partner # 9-11	34.1	31.9-36.4
Non-white # 3to6 # with a partner # up to 8	32.8	27.8-37.8
White # 1to2 # with a partner # >=12	32.5	17.7-47.4
Non-white # 7to15 # without a partner # 9-11	32.2	28.4-36.0
White # 3to6 # without a partner # 9-11	31.8	28.6-34.9
White # 7to15 # without a partner # up to 8	31.8	28.1-35.4
Non-white # 1to2 # with a partner # >=12	30.7	16.0-45.4
Non-white # 3to6 # without a partner # 9-11	29.9	25.7-34.2
Non-white # 7to15 # without a partner # up to 8	29.9	25.5-34.4
White # 3to6 # without a partner # up to 8	29.5	25.5-33.5
Non-white # 3to6 # without a partner # up to 8	27.8	23.2-32.4
White # 1to2 # without a partner # >=12	27.5	14.0-41.1
Non-white # 1to2 # without a partner # >=12	25.8	12.6-39.1
White # 1to2 # with a partner # 9-11	23.1	11.1-35.1
Non-white # 1to2 # with a partner # 9-11	21.6	10.0-33.2
White # 1to2 # with a partner # up to 8	21.3	9.8-32.8
Non-white # 1to2 # with a partner # up to 8	19.9	8.8-30.9
White # 1to2 # without a partner # 9-11	19.1	8.7-29.6
Non-white # 1to2 # without a partner # 9-11	17.8	7.8-27.9
White # 1to2 # without a partner # up to 8	17.5	7.6-27.5
Non-white # 1to2 # without a partner # up to 8	16.3	6.9-25.8

\* Group: Race # Number of prenatal visits # marital status # schooling in years of study.

The performance of cesarean section is related to several socioeconomic, demographic and clinical factors, such as: care in a private institution, the same physician during prenatal and delivery, previous cesarean section, age over 30 years, obesity, higher educational and economic status of the mother, poor fetal position, multiple pregnancy, prolonged gestation or labor, fetal distress, among others (Yuen, Painter, Abraham, Melian, & Denno, 2014; Freitas, Moreira, Manoel, & Botura, 2015; Oliveira, Melo, Novaes, Ferracioli, & Mathias, 2016; Silva et al., 2017; Zgheib, Kacim, & Kostev, 2017).

However, what can be analyzed with SINASC data used by the present study among women with conditions more favorable for vaginal childbirth, is that the greater access to information (higher education), to prenatal care (greater number of visits) and the opinion of another person (women with a partner) influenced the performance of cesarean delivery as a mode of delivery, suggesting that this decision seems to be influenced by the professional who accompanies prenatal care and their partner.

Despite high, the prevalence of the state of Santa Catarina corroborates other national studies (Reis et al., 2014; Gama et al., 2014; Oliveira et al., 2016; Silva et al., 2017) and international studies in developing countries (Yuen et al., 2014; Zgheib et al., 2017; Li et al., 2017).

In Brazil, strategies such as the National Program for the Humanization of Labor and Birth, implemented in 2002, and the Cegonha Network, implemented in 2011, also aim to encourage vaginal delivery, however, such policies have so far performed below expectations (Nascimento, Silva, Oliveira, & Monte, 2018).

In China, despite policies to encourage vaginal delivery, which include educational processes aimed at users of health services and physicians, practical training for obstetricians and obstetricians, setting local goals and, more recently, financial disincentives for failure to achieve target goals, the number of cesarean sections has increased from 28.8% in 2008 to 34.9% in 2014 (Li, et al., 2017).

In the present study, the probability of having a cesarean section when women are white, have higher education, have a partner and had more than 7 prenatal visits is higher, which is consistent with other studies (Yuen, et al., 2014; Gama et al., 2014; Souza et al., 2018).

According to the literature, women with the aforementioned factors have greater purchasing power and use a private service for childbirth, which are also associated with cesarean delivery (Souza & Pileggi-Castro, 2014; Yuen et al., 2014; Gama et al., 2014; Nijagal, Kuppermann, Nakagawa, & Cheng, 2015; Souza et al., 2018).

Women assisted by the private sector are 18 times more likely to perform cesarean section, considering that this is a sector that facilitates the performance of this procedure, as it allows the choice of women even when with more favorable conditions for vaginal delivery, to schedule the surgical procedure, be a choice of health professionals and even health establishments (Souza & Pileggi-Castro, 2014; Freitas et al., 2015; Han, Kim, Ju, Choi, & Park, 2017).

In addition, according to Barros et al. (2011), the combination of higher education with cesarean section, regardless of whether the institution is public or private, can be explained by two factors. The first is about the persuasive power of these women, and the second about the fact that obstetrical professionals have the perception that these patients are from the 'private' system and, therefore, deserve a cesarean section, seen as a procedure that avoids the suffering of women in childbirth.

The association of cesarean section and women with a partner found in the present study can also be related to economic status, since the partner can help in the greater financial stability of the family.

The main result of the present study is that for any sociodemographic group of women with conditions favorable for vaginal delivery, the fact of having only 1 or 2 prenatal visits reduces the probability of cesarean delivery. This finding may show that the less influence women have on services and health professionals, the less cesareans are performed.

For every ten women who start prenatal care, only three prefer cesarean sections. Nevertheless, at the end of pregnancy eight choose to have a cesarean section, especially due to the fact that in prenatal care there is an overestimation of the risks of vaginal delivery and stimulation of fear and insecurity (Souza & Pileggi-Castro, 2014; Weidle, Medeiros, Grave, & Dal Bosco, 2014). Moreover, a study carried out in Paraguay points out that after the reduction in home births and the increase in hospital births, the proportion of cesarean sections increased by 33.3%, which reinforces the influence of institutionalization of childbirth in the decision to have a cesarean (Yuen et al., 2014).

A study carried out in the United States found that after the implementation of clinical guidelines, the rate of cesarean sections among nulliparous women was substantially reduced, with the overall rate of cesarean sections decreasing from 26.9% to 18.8%, with a significant decline in maternal mortality (Wilson-Leedy, Di Silvestro, Repke, & Pauli, 2016).

The influence of health professionals in the decision for cesarean section should be considered, therefore, it is important to qualify professionals and clinical practices to reduce the rates of the referred surgical procedure (Weidle et al., 2014). In addition, counseling on normal childbirth during prenatal care is essential to reduce fear and insecurity in women, as fear of childbirth increases the risk of elective cesarean section (Ryding et al., 2015).

The reduction of cesarean section rates in Brazil is a complex issue and depends on multicomponents, considering that its determination is due to historically constructed issues, such as the role of professionals, institutionalization and medicalization of childbirth, organization of services, convenience and practicality, cultural aspects, among others (Souza & Pileggi-Castro, 2014).

In this direction, it is necessary to overcome these determining factors to allow the decision on the type of delivery to consider the best scientific evidence available, and for women to have sufficient knowledge to participate in this choice (Silva et al., 2017).

The present study had limitations inherent to a study based on secondary data. The possible selection bias stands out, given that not all situations that could lead to a cesarean are included in the SINASC form and

also because only women classified in Robson's Group 1 were analyzed, which does not allow comparison between groups. Thus, some of the pregnant women that we believe to have conditions favorable to normal childbirth could need a cesarean section according to the Brazilian Clinical Protocol and Therapeutic Guideline (Brasil, 2015).

However, when analyzing the difference between the total proportion of cesarean sections in Santa Catarina in 2016 and the study population, it appears that the rate is close to that recommended by World Health Organization, indicating that in fact the population included in the study could have had a vaginal delivery. Further, this study did not differentiate between public and private services, as it aimed to use SINASC, which contains population data from the state of Santa Catarina, which is freely accessible and with great statistical power to detect relatively small effects. Thus, it was possible to verify the synergistic effects for various combinations of risk factors, including those less frequent, but of great importance to focus on preventive interventions in them.

## Conclusion

White women, with a partner, a higher education level and a higher number of prenatal visits were more likely to undergo an unnecessary cesarean section.

As main recommendations for practice, we highlight: qualification of guidelines and preparation for delivery during prenatal care; implementation of clinical guidelines monitoring the percentage of cesarean sections; discussion; guarantee of informed choice; qualification in topics such as ethics, women rights, humanization and safety of labor and birth; greater presence of public policies in private institutions, to motivate the reduction of elective cesarean sections and promote evidence-based practice.

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## References

- Barros, A. J. D., Santos, I. S., Matijasevich, A., Domingues, M. R., Silveira, M., Barros, F. C., & Victora, C. G. (2011). Patterns of deliveries in a Brazilian birth cohort: almost universal cesarean sections for the better-off. *Revista de Saúde Pública*, 45(4), 635-643. DOI: <https://doi.org/10.1590/S0034-89102011005000039>
- Betrán, A. P., Ye, J., Zhang, J., Gülmezoglu, A. M., & Torloni, M. R. (2016). The Increasing Trend in Caesarean Section Rates: Global, Regional and National Estimates: 1990-2014. *Plos One*, 11(2), e0148343. DOI: <https://doi.org/10.1371/journal.pone.0148343>
- Brasil. Ministério da Saúde, Secretaria de Ciência, Tecnologia e Insumos Estratégicos. (2015). *Diretrizes de atenção à gestante: a operação cesariana*. Retrieved from <https://bitlybr.com/BHV7Op>
- Brasil. Ministério da Saúde, Departamento de Informática do SUS. (2019). *Informações de Saúde: estatísticas vitais*. Retrieved February 24, 2019, from <http://www2.datasus.gov.br/DATASUS/index.php?area=0205>
- Entringer, A. P., Pinto, M., Dias, M. A. B., & Gomes, M. A. de S. M. (2018). Análise de custo-efetividade do parto vaginal espontâneo e da cesariana eletiva para gestantes de risco habitual no Sistema Único de Saúde. *Cadernos de Saúde Pública*, 34(5), e00022517. DOI: <https://doi.org/10.1590/0102-311X00022517>
- Freitas, P. F., Moreira, B. C., Manoel, A. L., & Botura, A. C. A. (2015). O parecer do Conselho Federal de Medicina, o incentivo à remuneração ao parto e as taxas de cesariana no Brasil. *Cadernos de Saúde Pública*, 31(9), 1839-1855. DOI: <https://doi.org/10.1590/0102-311X00002915>
- Gama, S. G. N. da, Viellas, E. F., Schilithz, A. O. C., Filha, M. M. T., Carvalho, M. L. de, Gomes, K. R. O., ... Leal, M. do C. (2014). Fatores associados à cesariana entre primíparas adolescentes no Brasil, 2011-2012. *Cadernos de Saúde Pública*, 30(suppl 1), S117-S127. DOI: <https://doi.org/10.1590/0102-311X00145513>
- Han, K.-T., Kim, S. J., Ju, Y. J., Choi, J. W., & Park, E.-C. (2017). Do hospital characteristics influence cesarean delivery? Analysis of national health insurance claim data. *European Journal of Public Health*, 27(5), 801-807. DOI: <https://doi.org/10.1093/eurpub/ckx061>
- Kirchengast, S., & Hartmann, B. (2018). Recent lifestyle parameters are associated with increasing caesarean section rates among singleton term births in Austria. *International Journal of Environmental Research and Public Health*, 16(1), 1-14. DOI: <https://doi.org/10.3390/ijerph16010014>

- Lavender, T., Justus Hofmeyr, G., Neilson, J. P., Kingdon, C., & Gyte, G. M. (2012). Cesarean section for non-medical reasons at term. *Cochrane Database System Review*, 3(CD004660), 1-22. DOI: <https://doi.org/10.1002/14651858.CD004660.pub3>
- Li, H. T., Luo, S., Trasande, L., Hellerstein, S., Kang, C., Li, J. X., ... Blustein, J. (2017). Geographic variations and temporal trends in cesarean delivery rates in China, 2008-2014. *JAMA - Journal of the American Medical Association*, 317(1), 69-76. DOI: <https://doi.org/10.1001/jama.2016.18663>
- Mascarello, K. C., Horta, B. L., & Silveira, M. F. (2017). Maternal complications and cesarean section without indication: systematic review and meta-analysis. *Revista de Saúde Pública*, 51(1), 105-117. DOI: <https://doi.org/10.11606/S1518-8787.2017051000389>
- Nascimento, J. S., Silva, M. R., Oliveira, E. C.T., & Monte, G. C. S. B. (2018). Assistência à mulher no pré-natal, parto e nascimento: contribuições da rede cegonha. *Revista Portal: Saúde e Sociedade*, 3(1), 694-709. DOI: <https://doi.org/10.28998/rpss.v3i1.4241>
- Nakamura-Pereira, M., Leal, M. C., Esteves-Pereira, A. P., Domingues, R. M. S. M., Torres, J. A., Dias, M. A. B., & Moreira, M. E. (2016). Use of Robson classification to assess cesarean section rate in Brazil: the role of source of payment for childbirth. *Reproductive Health*, 13(S3), 245-265. DOI: <https://doi.org/10.1186/s12978-016-0228-7>
- Nijagal, M. A., Kuppermann, M., Nakagawa, S., & Cheng, Y. (2015). Two practice models in one labor and delivery unit: association with cesarean delivery rates. *The American Journal of Obstetrics & Gynecology*, 212(4), 491.E1-491.E8. DOI: <https://doi.org/10.1016/j.ajog.2014.11.014>
- Oliveira, R. R. de, Melo, E. C., Novaes, E. S., Ferracioli, P. L. R. V., & Mathias, T. A. de F. (2016). Fatores associados ao parto cesárea nos sistemas público e privado de atenção à saúde. *Revista da Escola de Enfermagem da USP*, 50(5), 733-740. DOI: <https://doi.org/10.1590/S0080-623420160000600004>
- Organização Mundial da Saúde [OMS]. (2015). *Declaração da OMS sobre taxas de cesáreas*. Retrieved from <https://bitlybr.com/4uP6gRi>
- Panda, S., Begley, C., & Daly, D. (2018). Clinicians' views of factors influencing decision-making for caesarean section: a systematic review and metasynthesis of qualitative, quantitative and mixed methods studies. *PLoS ONE*, 13(8), e0202688. DOI: <https://doi.org/10.1371/journal.pone.0200941>
- Patah, L. E. M., & Malik, A. M. (2011). Modelos de assistência ao parto e taxa de cesárea em diferentes países. *Revista de Saúde Pública*, 45(1), 185-194. DOI: <https://doi.org/10.1590/S0034-89102011000100021>
- Reis, Z. S. N., Lage, E. M., Aguiar, R. A., Gaspar, J. S., Vitral, G. L., & Machado, E. G. (2014). Associação entre risco gestacional e tipo de parto com as repercussões maternas e neonatais. *Revista Brasileira de Ginecologia e Obstetrícia*, 36(2), 65-71. Retrieved from <https://bitlybr.com/CJJNMghz>
- Ryding, E. L., Lukasse, M., Van Parys, A.-S., Wangel, A.-M., Karro, H., Kristjansdottir, H., ... Group, B. (2015). Fear of childbirth and risk of cesarean delivery: a cohort study in six european countries. *Birth*, 42(1), 48-55. DOI: <https://doi.org/10.1111/birt.12147>
- Silva, A. C. L., Félix, H. C. R., Ferreira, M. B. G., Wysocki, A. D., Contim, D., & Ruiz, M. T. (2017). Preferência pelo tipo de parto, fatores associados à expectativa e satisfação com o parto. *Revista Eletrônica De Enfermagem*, 19(1), 1-11. DOI: <https://doi.org/10.5216/ree.v19.44139>
- Souza, C. J. P., & Pileggi-Castro, C. (2014). Sobre o parto e o nascer: a importância da prevenção quaternária. *Cadernos de Saúde Pública*, 30(Sup), S11-S13.
- Souza, C. L. de, Mamédio, L. J. F., Brito, M. F., Silva, V. D. O. da, Oliveira, K. A. de, & Santos da Silva, E. (2018). Fatores associados à ocorrência do parto cesáreo em um hospital público da Bahia. *Revista Baiana de Saúde Pública*, 42(1), a2430. DOI: <https://doi.org/10.22278/2318-2660.2018.v42.n1.a2430>
- Weidle, W. G., Medeiros, C. R. G., Grave, M. T. Q., & Dal Bosco, S. M. (2014). Escolha da via de parto pela mulher: autonomia ou indução? Choice of delivery method by the woman: autonomy or induction? *Caderno de Saúde Coletiva*, 22(1), 46-53. DOI: <https://doi.org/10.1590/1414-462X201400010008>
- Wilson-Leedy, J. G., Di Silvestro, A. J., Repke, J. T., & Pauli, J. M. (2016). Reduction in the cesarean delivery rate after obstetric care consensus guideline implementation. *Obstetrics & Gynecology*, 128(1), 145-152.
- Yuen, J., Painter, I., Abraham, L., Melian, M., & Denno, D. M. (2014). A comparison of trends in cesarean delivery in Paraguay between 1995 and 2008. *International Journal of Gynecology & Obstetrics*, 126(3), 265-271. DOI: <https://doi.org/10.1016/j.ijgo.2014.03.030>
- Zgheib, S. M., Kacim, M., & Kostev, K. (2017). Prevalence of and risk factors associated with cesarean section in Lebanon - a retrospective study based on a sample of 29,270 women. *Women and Birth*, 30(6), e265-e271. DOI: <https://doi.org/10.1016/j.wombi.2017.05.003>