

Effectiveness of Reproductive Biology Educational Interventions in Reducing the Prevalence of Elective Caesarean Sections

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Abstract: Indonesia has the highest caesarean section rate globally, with a prevalence of 17.6% in 2018, rising to 22.50% among urban women by 2021, far exceeding the WHO recommendation of 10-15%. Although caesarean sections can be life-saving, they carry higher risks of complications for both mother and baby compared to normal delivery. This study aims to evaluate the impact of reproductive biology educational interventions on reducing elective caesarean sections at Aulia Pandeglang Regional Hospital in Banten in 2024. Utilizing a quasi-experimental design with a One Group Pre and Post Test approach, the research shows that such educational interventions significantly lower elective caesarean rates. Pre-test data revealed that 70% of cases were in the medium category, while post-test data showed a reduction to 43% in the low category. All respondents participated in both pre-test and post-test evaluations. The findings strongly support the effectiveness of reproductive biology education in decreasing elective caesarean sections, prompting Aulia Pandeglang Regional Hospital to continue its educational program for pregnant women to promote normal delivery.

Keywords: Educational interventio; Elective caesarean; Reproductive biology

Introduction

State Labor caesar is one of the most commonly performed surgical procedures worldwide. World Health Organization (WHO) sets the standard for caesarean section in many countries at around 10-15% per birth. Based on WHO research data in 2021, caesarean sections continue to increase globally, currently accounting for more than 1 in 5 (21%) of all births (Kjeldsen et al., 2023). Indonesia has the highest caesarean section rate globally, according to the Association of Southeast Asian Nations and the number is increasing every year. 2018 Basic Health Research (Riskesmas) data shows the prevalence of caesarean

sections in Indonesia is 17.6%. According to the latest data from the Indonesian Ministry of Health in 2021, the highest caesarean section rate (up to 22.5%) is among urban women in Indonesia. The high number of caesarean section deliveries in Indonesia exceeds WHO's conservative recommendation of 10-15% in a region (Indonesian Ministry of Health, 2022). Although a cesarean section can be a life-saving operation, it can also increase risks for the mother and negatively impact neonatal morbidity and mortality. Caesarean section has health risks and a longer recovery compared to normal delivery. Infection, bleeding, and other surgical complications may occur. The risk of complications for the baby, such as breathing difficulties, may also occur

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(Antoniou et al., 2021). Caesarean section can be differentiated based on surgical technique or medical indications, one of which is elective caesarean section. This operation refers to a caesarean section procedure that is carried out in a planned manner and without any urgent medical indications. The incidence of elective caesarean sections can vary significantly around the world and even within each country. Factors influencing these numbers include cultural norms, medical practices, access to health services, and individual preferences of pregnant women (Mahindra et al., 2020). Research conducted by Srivastava et al. (2022) in Bangladesh that around one third of women in the reproductive age group choose to give birth via caesarean section. Of these, 18.7% underwent elective caesarean section and 14.1% underwent emergency caesarean section. Women who have exposure to mass media are 32% more likely to give birth via elective caesarean section. Other research by Aulya et al. (2021) shows that the rate of elective caesarean delivery is higher (59.2%) compared to emergency caesarean delivery (40.8%) with the reason being mostly due to fear of the baby experiencing injury or asphyxia during labor.

The increasing trend of elective caesarean sections, especially without clear medical indications, has become a concern in various parts of the world. Several factors can contribute to this trend, namely perceived patient preferences, fear of normal delivery, fear of pain, safety and control, choice of delivery schedule, media and cultural influences, medical practices and local culture, availability of information, economic and insurance aspects. It is important to note that an elective caesarean section performed without a clear medical indication, may raise concerns related to overmedicalization and risks associated with medically unnecessary surgery (Tefera et al., 2020). Reducing the trend of elective caesarean sections can involve a variety of strategies aimed at providing information, supporting informed decisions, and promoting vaginal delivery when possible. One way that can be taken to reduce the trend of elective caesarean sections is by providing educational interventions on reproductive biology. The aim is to provide information, increase knowledge, understanding and support informed decision making (Ladja et al., 2021).

The success of reproductive biology educational interventions in reducing elective Caesarean sections can be influenced by specific cultural, social and public health contexts. Customizing interventions according to the needs and characteristics of the target population can increase their effectiveness. A thorough evaluation of these interventions needs to be conducted to measure their impact and adjust strategies if necessary. Reproductive biology educational interventions can

have a positive influence in reducing elective Caesarean section rates by increasing knowledge, changing attitudes, and influencing the behavior of pregnant women, partners, and health care providers (McFarlin, 2019). Research conducted by Sharma et al. (2022) showed the results that providing reproductive biology educational counseling about elective caesarean sections had an effect on reducing elective caesarean operations in pregnant women. In his research, it was explained that reproductive biology educational counseling can provide accurate and comprehensive information about the caesarean section procedure, its risks and benefits, as well as comparisons with normal delivery. This increased knowledge can help mothers make more informed decisions.

Other research by Khasanah et al. (2022) shows the results that providing educational outreach about elective caesarean sections to pregnant women can reduce the number of elective caesarean operations. In his research, it was explained that providing educational outreach can provide comprehensive information to pregnant women about the benefits, risks and normal delivery process. Prenatal education can help overcome fears and uncertainties that may influence the decision to have an elective cesarean section. Data obtained from the Aulia Pandeglang Regional Hospital shows that the rate of caesarean births carried out at the hospital was 30.25% of all births during the period 2022 - 2023. Elective caesarean operations were 21.63% and emergency caesarean operations were 78.37%. In this period there was 1 maternal death out of 1217 caesarean operations, and maternal deaths were included in the emergency caesarean section group. Death is directly caused by bleeding (RSUD Aulia, 2023). Cesarean delivery, whether elective or emergency, is a surgical procedure that involves certain risks and according to WHO a caesarean section rate of more than 15% cannot be justified. Based on the background description above, researchers feel it is important to conduct research on "The effectiveness of reproductive biology educational interventions in reducing the number of elective caesarean sections at Aulia Pandeglang Hospital, Banten in 2024".

Method

This research uses the method like an experiment with approach one group pre-posttest design, in this design, the researcher only intervenes in one group without a comparison. The effectiveness of the treatment is assessed by comparing the values posttest with pretest (Sugiyono, 2018). The population in this study was 30 pregnant women in the third trimester recorded in the Aulia Hospital medical record data for the 2024 period. The sampling method in this research uses techniques

total sampling that is, the entire population in the case was used as the research sample, so the number of samples taken was 30 people. This research will be carried out at Aulia Pandeglang Hospital, Banten. This research will be carried out in February 2024, and data collection will be carried out in March 2024 in weeks 1 to 2. The independent variable in this study is reproductive biology educational intervention, while the dependent variable in this study is reducing the number of elective caesarean sections. In this research, the author collected data using primary data. Data was taken from the results of filling out questionnaires to measure independent variables, while data to measure reproductive biology educational intervention variables, researchers used the lecture method with the media leaflet and SAP. Univariate analysis was carried out to determine the average value of respondents' level of knowledge and understanding before and after being given the intervention. The normality test in this study was used skewness and kurtosis. Skewness is the degree of asymmetry of a frequency distribution. Data analysis in this research used the t-test.

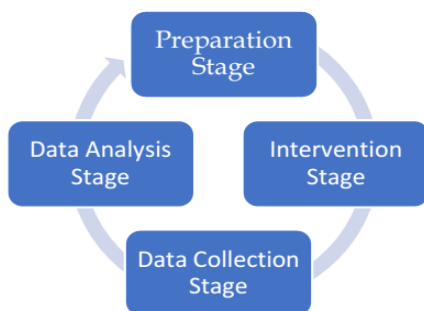


Figure 1. Stages of the research

Result and Discussion

Results

Univariate Analysis

Univariate analysis aims to describe the frequency distribution of the characteristics of the research variables using descriptive statistics. According to Table 1 of 30 respondents, 70% are over 20 years old, 70% have a high school degree, 77% of them are Housewives (IRT), 37% are experiencing a second pregnancy, 70% of elective Caesarean rates are in the medium category during pretest, 43% of elective Caesarean rates were in the low category during the post test and 100% of respondents took part in the pre and posttest reproductive biology educational intervention.

Based on Table 2, it shows that the average score for elective caesareans before being given reproductive biology educational intervention was 1.70 with Std. Deviation 0.466. The highest elective caesarean rate score was 2 and the lowest elective caesarean rate score was 1.

Meanwhile, after being given reproductive biology educational intervention treatment, the average result was 2.43 with Std. Deviation 0.504, the highest elective caesarean rate score is 3 and the lowest elective caesarean rate score is 2.

Table 1. Frequency Distribution of Respondent Characteristics Based on Age, Education, Occupation, Pregnancy at Carita Community Health Center

Characteristics	F	Percentage (%)
Age		
< 20 years	9	30
≥ 20 years	21	70
Total	30	100
Education		
SD	3	10
Junior High School	3	10
SMA	21	70
College	3	10
Total	30	100
Work		
IRT	23	77
Employees/Laborers	4	14
Businessman	1	3
Civil servants	2	6
Other	0	0
Total	30	100
Pregnancy		
One	9	30
Two	11	37
Three	10	33
Total	30	100
Elective Caesarean Rate during Pre-Test		
High	9	30
Currently	21	70
Total	30	100
Elective Caesarean Rate at Post-Test		
Currently	17	57
Low	13	43
Total	30	100
Reproductive biology educational intervention		
Before	30	100
Total	30	100
Reproductive biology educational intervention		
After	30	100
Total	30	100

Source: Primary Data (SPSS 29 Data Processing Results)

Table 2. Average Elective Caesarean Rates Before and After Reproductive Biology Educational Interventions

Elective Caesar figures	N	Min	Max	Mean	Std. Deviation
Pre-Test (Before Intervention)	30	1	2	1.70	0.466
Post-Test (After Intervention)	30	2	3	2.43	0.504

Source: Primary Data (SPSS 29 Data Processing Results)

Bivariate Analysis

In Table 3, the results of the pre-test Skewness ratio can be obtained, namely $(-0.920) - 0.427 = -2.153$ and the Kurtosis ratio, namely $(-1.242) - 0.833 = -1.492$. Meanwhile, the post test results for the Skewness ratio were $0.283 - 0.427 = -0.664$ and the Kurtosis ratio was $(-2.062) - 0.833 = -2.476$. These results show that the data distribution of the variable "Elective Caesarean" is close to a "normal" distribution, so the test that will be used to see the effectiveness of reproductive biology educational interventions in reducing the number of elective Caesareans is the Test *Paired Sample T-Test*.

Table 3. Data Normality Test (Skewness and Kurtosis)

Variable	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Elective Caesarean (Pre Test)	-0.920	0.427	-1.242	0.833
Elective Caesarean (Post Test)	0.283	0.427	-2.062	0.833

Source: Primary Data (SPSS 29 Data Processing Results)

Table 4. Effectiveness of Reproductive Biology Educational Interventions in Reducing the Rate of Elective Caesarean Sections at Aulia Pandeglang Hospital, Banten

Variable	N	Statistics		Paired T-Test	
		Descriptive M (Std. D)	t	df	Sig. (2-tailed)
Current elective caesarean rate Pre-Test	30	1.70 (0.466)	-8.930	29	0.000
Current elective caesarean rate Post-Test	30	2.43 (0.504)			

Source: Primary Data (SPSS 29 Data Processing Results) *T-test

Based on table 4, the test results are shown Paired Sample T-Test shows significant numbers between pre and post test scores with significance values (2-tailed) $p = 0.000 < 0.05$. This means that there is strong evidence that reproductive biology educational interventions significantly reduce the number of elective caesareans at the Aulia Pandeglang Hospital, Banten.

Discussion

The results of the study showed that the average score for elective caesareans before being given reproductive biology education intervention was 1.70 with Std. Deviation 0.466. The highest elective caesarean rate score was 2 and the lowest elective caesarean rate score was 1. Meanwhile, after being given reproductive biology educational intervention treatment, the average result was 2.43 with Std. Deviation 0.504, the highest elective caesarean rate score is 3 and the lowest elective caesarean rate score is 2. In line with research conducted

by Zahroh (2023) that educational interventions targeting pregnant women to optimize the use of caesarean operations consist of intervention elements that utilize social support or peers through group-based interventions, providing communication materials to women, encouraging emotional support by partners or family participation, and giving women opportunities to interact with health care providers.

Likewise, Dewianti (2022) stated that the development of an application-based reproductive biology education model and prenatal yoga with the creation of the Dewi Bidanku application, there is a significant difference in the knowledge of pregnant women about choosing a delivery method between the intervention group and the control group $p=0.000 < 0.05$, there is a significant difference in the attitude of pregnant women on the choice of delivery method between the intervention group and the control group, $p=0.000 < 0.05$, there was an effect of providing application-based reproductive biology education on reducing the incidence of CS delivery with a value of $p=0.001 < 0.05$. Strengthened by the results of research (Arif et al., 2022) entitled "The Effect of Providing Reproductive Biology Education on Preoperative Preparation via Multimedia Video on Anxiety Levels in Pre-Elective Surgery Patients" that providing reproductive biology education has a great influence on pre-operative preparation via multimedia video on anxiety levels in elective pre-operative patients.

Theory also states that reproductive biology educational interventions can provide accurate and comprehensive information to pregnant women and partners about the normal birth process, the risks and benefits of natural birth methods, as well as the options available. Better knowledge can help reduce the uncertainty and concerns that may drive the choice of elective Caesarean section (Chen et al., 2021). Through reproductive biology educational interventions, participants can develop a more positive attitude towards natural birth and change their intention to choose a natural birth method. This change in attitude can influence their decisions regarding delivery methods (Alshdefat & Alshdaifat, 2020). This research shows the test results Paired Sample T-Test shows significant numbers between pre and post test scores with significance values (2-tailed) $p = 0.000 < 0.05$. This means that there is strong evidence that reproductive biology educational interventions significantly reduce the number of elective caesareans at the Aulia Pandeglang Hospital, Banten. In line with research conducted by Umam et al. (2022) that involving communities in reproductive biology educational interventions can also create cultural change regarding childbirth.

Community support can help create norms that support vaginal birth and reduce the pressure to choose an elective Caesarean section without clear medical indications. Providing knowledge and information can empower participants to take an active role in decision making about their birth, including the choice of delivery method and can provide psychosocial support to participants, helping them feel more confident in facing a normal birth (Bam et al., 2021). Research conducted by Sharma et al. (2022) showed the results that providing reproductive biology educational counseling about elective caesarean sections had an effect on reducing elective caesarean operations in pregnant women. In his research, it was explained that reproductive biology educational counseling can provide accurate and comprehensive information about the caesarean section procedure, its risks and benefits, as well as comparisons with normal delivery. This increased knowledge can help mothers make more informed decisions.

Theory also suggests that reproductive biology educational interventions can facilitate the involvement of couples and families in the decision process regarding childbirth. By gaining a better understanding, partners and families can provide more positive support for the choice of natural birth (Romanis, 2019). There are several research limitations that researchers found during conducting research. There are many external factors that can influence the caesarean section rate, such as hospital policies, economic factors and community culture which were not controlled in the research, Patient compliance with biology education reproductions provided may vary, and this may influence the results of the study, Respondents may report information that researchers consider most desirable, rather than the actual information, Studies that only look at short-term effects may not provide a complete picture of the effectiveness of biology educational interventions reproduction in the long term.

Conclusion

In this study, the data shows that before the reproductive biology education intervention was carried out, around 70% of elective Caesarean section cases at Aulia Pandeglang Hospital, Banten were in the moderate category according to the pre-test results. However, after implementing educational interventions that focused on aspects of reproductive biology, significant changes occurred. Post-test results revealed that the rate of elective Caesarean sections which were included in the low category increased to 43%. This showed a significant reduction in the prevalence of elective Caesarean sections after the educational intervention was carried out. All respondents involved

in this study, which covers 100% of the targeted population, took both the pre-test and post-test. These results provide strong evidence that educational interventions regarding reproductive biology can effectively reduce the frequency of elective Caesarean sections. In other words, this educational program not only increases the knowledge of patients and medical personnel about the biological aspects of the birth process but also has a positive impact on the medical decisions taken, especially in the context of reducing elective Caesarean sections. These findings support the importance of continuing education in managing and reducing the need for unnecessary surgical procedures.

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Author Contributions

The following statements should be used Conceptualization ESF, TPW, TS, T, E, EA contributed to the data collection process, data processing, article writing.

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Conflicts of Interest

The authors declare no conflict of interest.

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