Research Article

Effectiveness of Participation in Pregnancy Classes to Reduce the Incidence of Obstetric Labor Complications and Cesarean Section

Efektivitas Keikutsertaan Kelas Ibu Hamil untuk Mengurangi Kejadian Komplikasi Persalinan dan Operasi Sesar

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Abstract

Objective: To assess the effectiveness of participation in pregnancy classes to inform such a prenatal program for physicians and midwives, focusing to reduce the incidence of obstetric labor complications and cesarean section.

Methods: This study was done using an analytic observational approach, using a cross-sectional study and consecutive sampling. One hundred and ninety-four participants of this study were women aged 20–35 years who gave birth between January and November 2019 in balarejo sub-district, East Java, Indonesia. The subjects were divided into two groups: participation (four times) and non-participation (less than four times) in the pregnancy classes. The analyzed outcomes are labor complications (prolonged labor, postpartum hemorrhage, postpartum fever, premature rupture of membrane), and cesarean section birth.

Results: The results of this study indicate that participants of pregnancy classes have a significantly lower probability of suffering prolonged labor (OR=0.05, 95% CI=0.01-0.23, p<0.05), postpartum hemorrhage (OR=0.20, 95% CI=0.04-0.95, p<0.05), and postpartum fever (OR=0.13, 95% CI=0.16-1.08, p<0.05) compared with non-participants. Also, participating women have a lower chance of undergoing cesarean section (OR=0.08, 95% CI=0.03-0.21, p<0.05).

Conclusion: The incidence of obstetric labor complications and cesarean section can be effectively reduced by the participation of pregnant woman class.

Keywords: cesarean section, obstetric labor complications, prenatal education.

Abstrak

Tujuan: *Mengetahui efektivitas keikutsertaan kelas ibu hamil, sebuah program prenatal oleh dokter atau bidan, yang berfokus untuk mengurangi kejadian komplikasi persalinan dan operasi sesar.*

Metode: *Penelitian ini menggunakan pendekatan observasional analitik, studi potong lintang dengan konsekutif sampling. 194 subjek penelitian adalah perempuan berusia 20-35 tahun yang melahirkan antara Januari-November 2019 di wilayah kerja Puskesmas Balerejo, Jawa Timur, Indonesia. Subjek dibagi menjadi dua kelompok partisipasi (empat kali kunjungan), dan non-partisipasi (kurang dari 4 kali kunjungan) dalam kelas ibu hamil. Hasil yang dianalisis adalah komplikasi persalinan (partus memanjang, perdarahan pascasalin, demam pascasalin, ketuban pecah dini), dan persalinan dengan metode operasi sesar.*

Hasil: *Hasil penelitian ini menunjukkan bahwa partisipasi kelas ibu hamil telah menurunkan secara bermakna probabilitas kejadian partus memanjang (OR=0.05, 95% CI=0.01-0.23, p<0.05), perdarahan paska salin (OR=0.20, 95% CI=0.04-0.95, p<0.05), dan demam pascasalin (OR=0.13, 95% CI=0.16-1.08, p<0.05) dibandingkan dengan non-partisipan. Selain itu, wanita yang mengikuti kelas ibu hamil juga menurunkan kejadian persalinan melalui operasi sesar (OR=0.08, 95% CI=0.03-0.21, p<0.05).*

Kesimpulan: *Kejadian komplikasi persalinan dan persalinan dengan operasi sesar secara efektif dapat dikurangi dengan keikutsertaan program kelas ibu hamil.*

Kata kunci: *kelas ibu hamil, komplikasi persalinan, operasi sesar.*

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INTRODUCTION

The maternal mortality rate (MMR) in Indonesia remains high, occurs around 305 per 100,000 live births. This figure is much higher than the MDG's target. The MDG's target in 2015 was to reduce the MMR number to 102 per 100,000 live births.[1] East Java Province in 2017 showed that the incidence of MMR had reached 91.92, an increase on the previous year that saw 91 per 100,000 live births. Maternal deaths occur mostly in developing countries. Dominated by low-income countries, South-Eastern Asia indicated that there were 16.000 mothers death, which comprised a point estimate of 137 in MMR.[2]. The most common causes are bleeding, eclampsia, sepsis, abortion, and labor obstruction.[3] As a part of East Java, the Madiun Regency had been reported with an MMR at around 65.80.[4] in East Java, the two most common causes of MMR are pre-eclampsia/ eclampsia (28.9%) and postpartum hemorrhage (28.28%).

The maternal mortality rate has not been significantly reduced, it has actually increased every year. One of the government programs to reduce the MMR that has been running since 2010 is the class for pregnant women. These pregnancy classes are about women learning about pregnancy health together, in the form of face-to-face groups. This program aims to increase knowledge5 and skills regarding pregnancy, prenatal care, childbirth, postnatal care, newborn care, myths, infectious diseases, and compliance in routine antenatal care visits, and the maximum number of participants per class is ten pregnant women of gestational ages between 20 and 32 weeks.[5,6] The classes are facilitated by midwives or health workers who have trained as class facilitators for pregnant women. The program comprises four meetings with a different material in each at the beginning of each meeting there is a pretest, and at the end of each meeting there is a posttest, according to the material provided and pregnancy exercises.

Prenatal education provides training on adaptations in pregnancy, preparation for childbirth, preparation for potentially dangerous situations, postpartum contraception, and breastfeeding.[7] In Sweden, participants of pregnancy classes feel safer and more ready for the delivery process.[8] Prenatal education is expected to identify disease history and various risk factors for pregnancy and labor complications.[9] Labor complications are circumstances that deviate from normal conditions, which can cause morbidity and death of the mother and baby as a direct result of childbirth. According to the Indonesian Demographic Health Survey 2007, the types of labor complications are prolonged labor (37%), bleeding (9%), fever (7%), seizures (2%), and other complications (4%).[10] To address this problem, a study in Indonesia stated that there was a significant relationship between pregnancy classes and labor complications.[11]

Pregnancy classes aim to increase the readiness of pregnant women for the delivery process. Previous studies have reported that women who participate in prenatal education can reduce and control their fear, anxiety, and stress during childbirth.[7,12] The fear felt by a pregnant woman, if not controlled properly, can prolong the labor process and increase the incidence of cesarean section. A mother who participated in prenatal education reported having a higher readiness for labor, so she had a lower risk of cesarean section delivery.[7] Research conducted to evaluate childbirth education classes showed that there were benefits to pregnancy classes, to reduce the incidence of delivery via cesarean section by 10% and therefore have a significant effect on vaginal delivery (non-section).[13]

The problem of maternal mortality, including complications in childbirth and the increasing incidence of deliveries via cesarean section, has prompted the authors of this study to conduct studies that assess the effectiveness of pregnancy class participation in reducing labor complications and cesarean sections.

METHODS

An analytic observational cross-sectional study with 194 respondents was carried out, using the consecutive sampling technique. The inclusion criteria were women aged 20–35 years who gave birth between January and November 2019 in Balarejo-sub district, East Java, Indonesia. The exclusion criteria were women who had a history of cesarean delivery and those who had cephalopelvic disproportion. The subjects were divided into two groups: participation (four times) and non-participation (less than four times) in pregnancy classes. The dependent variables included complications in labor and delivery through cesarean section. The operational definition of pregnancy class participation (prenatal education) was participation in a pregnancy class at least four

times, whereas the operational definition of labor complications was a situation that deviates from normal conditions, which can cause morbidity and mortality of mothers and babies as a direct result of childbirth. In this study, the four main complications of labor were prolonged labor, postpartum hemorrhage, postpartum fever, and premature rupture of membranes. The chi-square test was used to compare both groups. Odds ratios were calculated for each delivery outcome with a 95% confidence interval (CI).

This study has been approved by Balerejo Primary Health Care (No. 445/ 322/ 402.102.05/ 2020) that covers the waiver of consent and the statements of minimum risk of study to the subjects. The data of all respondents' who agreed to participate in this study was concealed and thus only used for study purposes.

RESULTS

Table 1. Characteristics of Participating Mothers

	Amount	%
Age (in years)		
20–24	51	26.3
25–29	95	48.9
30–35	48	24.8
Education Qualification		
No degree	59	30.4
Diploma	80	41.2
Graduate	55	28.4
Financial Status		
Low–middle income	116	59.8
Middle–high income	78	40.2
Parity		
Nulliparous	104	53.6
Primiparous	63	32.5
Multiparous	27	14.0
Delivery Method		
Cesarean section	47	24.2
Vaginal birth	147	75.8
Prenatal education		
Participating	98	50.5
Not participating	96	49.5

Table 1. Distribution of Delivery Complications in the Case Group and the Control Group

Delivery Outcomes	Pregnancy Class			
	Participant (n=98) 50.5 (%)	Non Participant (n=96) (49.5) %	OR (95% CI)	*P-value*
Obstetric Labor Complication				
Prolonged labor	2 (6.9)	27 (93.1)	0.05 (0.01-0.23)	0.032
Postpartum hemorrhage	2 (18.2)	9 (81.8)	0.20 (0.04-0.95)	0.034
Postpartum fever	1 (12.5)	7 (87.5)	0.13 (016-1.08)	0.116
Premature rupture of membrane	1 (16.7)	5 (83.3)	0.18 (0.02-1.63)	
Delivery Method				0.000
Cesarean section	6 (12.8)	41 (87.2)	0.08 (0.03-0.21)	0.000
Vaginal birth	92 (62.6)	55 (37.4)	11.43 (4.55-28.66)	

This study selected a total of 194 participants who were eligible for analyses. Table 1 shows the characteristics of mothers. The participants were mostly composed of women aged 25–29 years old, which made up 48.9% of the total, while 53.6% had no prior history of giving birth (nulliparous). Regarding socioeconomic status, the participants were predominantly women who had a diploma qualification and were in the middle- or lower-income range, comprising 41.2% and 59.8%, respectively. Just over half of the women (50.5%) attended the educational pregnancy course. Furthermore, roughly three quarters (75.8%) of the total proportion gave birth spontaneously, the remainder giving birth via the mode of cesarean section and comprising almost one quarter. In this study, prolonged labor accounted for most of the complicated labor cases leading to cesarean section, accounting for more than half of the total number of women who gave birth via this method. The other common labor complications were postpartum hemorrhage, postpartum fever, and premature rupture of the membrane, comprising no more than one-third of the total proportion. Furthermore, statistical analysis was used to determine the odds ratio (OR) for included women with labor complications.

The evidence of statistical results showing the delivery outcome probability in women who participated in pregnancy classes compared to non-participants can be seen in Table 2, which includes the OR and 95% CI. In this study, women who attended the pregnancy classes program had a significantly lower chance of experiencing prolonged labor [(OR=0.05, 95% CI=0.01-0.23) $p<0.05$]. Postpartum hemorrhage probability was also demonstrated to be significantly lower in the participant group [(OR=0.20 95% CI=0.04-

0.95) p<0.05]. Also, mothers who signed up for the program had a significantly lower chance of developing a fever after delivery [(OR=0.13, 95%CI=0.16-1.08) p< 0.05]. Conversely, premature rupture of the membrane was reported to be not significant, although the odds were lower for women who participated in the classes [(OR=0.18, 95%CI=0.02-1.63) p>0.05]. Following labor complications, participants of the pregnancy classes were not only reported to have a lower probability of delivering their babies abdominally compared to non-participants [(OR=0.08, 95%CI=0.03-021) p<0.05], they also had a higher chance of being given the option of a vaginal delivery [(OR=11.43, 95%CI=4.55-28.66) p<0.05]. Overall, the study results show that there was a significant difference between participants and non-participants in terms of labor complications and cesarean section.

DISCUSSION

This study found that participant women had significantly lower odds of experiencing prolonged labor, postpartum hemorrhage, and postpartum fever than those in the non-participant group. With regards to delivery method, women in the participant group had significantly lower odds of delivering their babies abdominally. A comparative study on pregnant women in Yogyakarta and the rural area of Semarang described how prenatal education can expand the knowledge of pregnant women about the obstetric labor complications and delivery method, according to the evaluation of pretests and posttests completed after classes.[14,15] Lack of support and knowledge are considered essential factors that can decrease the eagerness of pregnant women to participate in such classes.[9] Other factors, including the provision of visual media in prenatal education knowledge transfer, might attenuate the process of information translation.[16]

Our study implied the antenatal education plays a significant role to reduce the odds of various labor complications, namely prolonged labor, postpartum hemorrhage, and postpartum fever. A study regarding pregnancy classes in Indonesia reported the same significance by demonstrating case-control studies that resulted in the reduction of labor complications via prenatal education.[11] Another similar study conducted in Central Java also indicated this result, describing the multiparity status and lack of education of pregnant women as causative factors that impact labor complications.[17] The effectiveness of labor preparation class, a training program consisting of how to do various techniques stretching exercise, relaxation, breathing patterns, and massage during labor, found that the class can enhance the positive attitudes and vitality toward normal delivery in the participant group.[18] A study on women's experience revealed that certain activities such as efficient education absorbed by pregnant women to understand more detailed information on vaginal delivery and prenatal yoga exercise can benefit them in their physique readiness and breathing control during the labor process.[19] These learned abilities are pretty rewarding to spare the energy needed for the delivery process and therefore prevent the arrests of labor.

A similar program to pregnancy classes is defined differently in many countries worldwide. Regarding the delivery method preferred for women, our study resulted in the decreased odds for cesarean section and otherwise increased the odds to deliver babies via vaginal delivery. Our study is in line with a few previous studies in which results demonstrated the significant impacts of prenatal education on the probability of vaginal birth and assisted birth, but did not cause the rates of cesarean birth to increase.[20-22] However, a study in British Columbia reported that women who attended childbirth education classes had a lower rate for cesarean surgery, whether it was arranged by the obstetrician or due to patients' requests.[23] Nonetheless, there was another study involving Italian women given prenatal education. This study showed a higher incidence of cesarean delivery in non-participants compared to participants, although proving that prenatal education can reduce the risk of cesarean section. Nevertheless, the study was considered weak because the definition of prenatal education was not correctly standardized.[12] Evaluated the psychologic effect, prenatal education is proven to be effective in reducing the fear of delivery in primiparous women.[24] Meanwhile, there was a study that stated such pregnancy classes to be not beneficial in reducing cesarean section incidence. In contrast with our findings, a retrospective study involving one term of childbirth education classes to manage the risk of labor difficulty reported that the classes were significantly effective in lowering the risk of vacuum extraction, but did not have the same effect on reducing the cesarean rate.21 A study evaluating prenatal education stated

that the program could not be carried out to maximize the benefits because there would be many considerations, such as the cultural and community background of the women and the healthcare providers' method of encouraging pregnant women to join.[25]

Therefore, pregnancy classes conducted according to the guidelines is aiming for the detection, prevention, and elimination of abnormalities in pregnancy, which can be complicating factors during the delivery process. The implementation of the program has its weaknesses the role of the Health Service has not been optimal in encouraging the implementation of this program, including a lack of operational support facilities and intensive facilitator training, which can be burdensome for primary healthcare (PHC) services.[5,26]

CONCLUSIONS

Pregnancy class participants can lower the probability of cesarean section delivery and fewer labor complications, such as prolonged labor, postpartum hemorrhage, and postpartum fever. Hence, pregnancy classes are really advised to be obtained by pregnant women to prepare vaginal birth. However, due to the lack of similar studies reporting on prenatal education programs, this study can be used as an evaluation of the effectiveness of such programs and as one of the beneficial programs related to women's health in primary healthcare settings. However, confounding factors such as economic class and degree of education are thought to affect the ongoing program. Thus, a further study evaluating these confounding factors should be carried out to clarify the efficacy of pregnancy classes in managing pregnant women.

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