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FACTORS AFFECTING THE INCIDENCE OF PLACENTAL RETENTION IN PREGNANT

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ABSTRACT
Placental retention is a critical medical condition where the placenta fails to exit the uterus after childbirth, potentially causing severe bleeding and maternal death. It is identified when the placenta remains inside the uterus 30 minutes after delivery. This study examines factors influencing placental retention at Dr. Moewardi Regional General Hospital, Surakarta. Using a quantitative case-control design, this study compared 200 medical records: 100 with placental retention and 100 without, using a simple random sampling technique. Inclusion criteria were medical records from 2021 to 2024 detailing maternal age, parity, childbirth history, delivery type, uterine contractions, abortion history, and education, while incomplete records were excluded. The analysis of the data was conducted using the chi-square test, applying a significance threshold set at p less than 0.05. Results revealed significant relationships between childbirth history (p=0.000), delivery type (p=0.000), uterine contractions (p=0.000), and placental retention. However, maternal age (p=0.499), parity (p=1.000), abortion history (p=0.078), and education (p=0.091) showed no significant associations. These findings can guide future research using different methodologies.

Keywords: control case study; factors; maternity; placental retention

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INTRODUCTION

Placental retention is a very dangerous medical condition, where the placenta fails to come out of the uterus after the delivery process, so it can cause severe bleeding and maternal death. This occurs when the baby does not come out within 30 minutes after the baby is born (World Health Organization, 2020). Excessive and unregulated bleeding stands as a significant contributor to maternal mortality during the postpartum phase (Liskayani et al., 2023). Indonesia is still faced with the fact that maternal mortality due to placental retention remains one of the most worrying health problems. In the year 2020, the Ministry of Health of the Republic of Indonesia (Kemenkes RI) documented approximately 5,433 cases of maternal mortality, which were attributed to complications arising from pregnancy and childbirth, with placental retention being one of the contributing factors. In Indonesia, AKI due to placental retention accounts for 10.3% of all maternal deaths. The maternal mortality rate (MMR) in Papua and West Papua serves as a crucial metric for evaluating the overall health status of a specific region or population group. (Masturoh et al., 2022). East Nusa Tenggara has the highest Maternal Mortality Rate (MMR) due to placental retention. However, due to placental retention, there are actions that must be taken to reduce the Maternal Mortality Rate (MMR) in Indonesia(Astuti, 2020). Placental retention is one of the obstetric complications that can occur in childbirth. This condition, if left untreated, can cause postpartum bleeding (Idealistiana et al., 2024).

Based on statistics provided by the Ministry of Health of the Republic of Indonesia, the maternal mortality rate in the country remains relatively high. Despite this, there has been a noticeable decline over the years, with the maternal mortality rate dropping from 390 to 228 between 1991 and 2007. Furthermore, the data from the 2012 Indonesia Demographic and Health Survey (IDHS) indicated a rate of 359 maternal deaths per 100,000 live births, which further decreased to 306 per 100,000 live births by 2019 (Ministry of Health of the Republic of Indonesia, 2019). In Central Java in 2019, the maternal mortality rate due to placental retention was still quite high. In 2019, Central Java recorded a maternal mortality rate of 75.8 deaths for every 100,000 live births, highlighting a significant public health concern in the region (Ministry of Health of the Republic of Indonesia, 2019). One of the most common causes of maternal mortality is placental retention, which accounts for 3.45% of total maternal mortality in that year (Central Java Provincial Health Office, 2019).

Placental retention results in blood vessels connected to the placenta continuing to flow blood, while the uterus cannot close properly, so it is unable to stop bleeding. This can cause serious bleeding and potentially threaten the mother's life. Predisposing factors for placental retention are age, parity, pregnancy distance, previous labor history (Astuti, 2020). Other literature adds education, history of abortion and anemia status as factors that are also related to the occurrence of placental retention (Haryati et al., 2022). The placenta must be removed from the uterus because it can result in some serious complications, such as bleeding that can occur due to uterine contractions that pump blood but cannot close the wound due to the part of the placenta that is still attached. In addition, placental retention can also cause infection due to the presence of inanimate objects left in the uterus which can increase the growth of bacteria, especially at the place of attachment of the placenta. If the placenta is not removed from the uterus immediately, then serious complications such as placenta incarserata, which is a condition in which the placenta remains attached to the uterine wall even though the uterine ostium contractions are still functioning properly. Failure to remove the placenta can also lead to the formation of placental polyps, which is a period of tissue that experiences secondary infection and necrosis due to the absence of proper placenta removal (Tchuinte Lekuikeu & Moreland, 2022). Childbirth is a very important event in a woman's life. Where the latent phase is the period from the beginning of labor which generally starts from the onset of contractions to the opening of 3-4 cm within 7-8 hours. An elongated latent phase occurs when the latent phase is more than 20 hours in nulipara and 14 hours in multipara (Vidi et al., 2019).

In Rahmawati's research (2023), it was discovered that variables including maternal age, number of previous childbirths, history of miscarriages, and past cesarean deliveries were associated with the occurrence of placental retention cases at Prabumulih Hospital during 2020. The study further revealed that, within the same year, a total of 43 mothers experienced placental retention following childbirth. Based on this background, it is necessary to conduct a study to determine the factors associated with the incidence of placental retention at Dr. Moewardi Surakarta Hospital.

METHOD

The research employs a quantitative approach utilizing a Case-Control design, characterized as an observational and analytical study. This method involves a comparative analysis between a case group and a control group, focusing on their respective exposure statuses. This research was conducted from September 2023 to October 2024. Data for this study were collected in September and October 2024. The research population taken consisted of medical records of pregnant women at Dr. Moewardi Surakarta Hospital from 2021 to 2024. Inclusion criteria in this study: Medical records of maternity at Dr. Moewardi Surakarta Hospital from 2023 to 2024, including, maternal age, parity, childbirth history, type of childbirth, uterine contractions, abortion history and education. Exclusion criteria in the study: Incomplete medical records of the maternity mother. The number of samples was 200 medical records of maternity mothers consisting of 100 medical records of maternity mothers who experienced placental retention during childbirth and 100 medical records of maternity mothers who did not experience placental retention, data collection was carried out based on inclusion and exclusion criteria, using a simple random sampling technique.

The method of collecting this data uses secondary data with the instrument of the medical record of the maternity mother. The methods of analysis applied in this research comprise both univariate and bivariate techniques. Univariate analysis was conducted to examine the frequency and percentage of the data, whereas bivariate analysis was employed to assess the relationship between variables using the chi-square test. The importance of the study's findings was assessed using a p-value, where a value below 0.05 suggests statistical significance. This provides compelling evidence to dismiss the null hypothesis and demonstrates a significant relationship between the variables. Data collection took place following approval from the Faculty of Health Sciences at the University of Muhammadiyah Surakarta, as well as Dr. Moewardi Hospital. This study has obtained ethical approval from the Health Research Ethics Commission of Dr Moewardi Hospital with number: 2.239/IX/HREC/2024.

RESULT

Table 1.
Distribution of Respondent Frequency and Percentage among Maternity Based on Research Variables (n=200)

Variable	Case		Control	
	f	%	f	%
Age				
<20 years	1	25	3	75
20-35 years old	75	49,3	77	50,7
>35 years'	24	54,5	20	45,5
Parity				
Nulipara	43	43,0	43	43,0
Primipara	27	27,0	27	27,0
Multipara	30	30,0	30	30,0
Previous labor history				
Not yet giving birth	28	84,8	5	15,2
Spontaneous delivery	34	65.4	18	34,6
Caesarean delivery	23	24,0	73	76,0
Curated	15	78,9	4	21,1
Types of childbirth				
Spontaneous delivery	86	81,9	19	18,1
Caesarean delivery	14	14,7	81	85,3

Variable	Case		Control	
	f	%	f	%
History of abortion				
Not having an abortion	68	46,3	79	53,7
Experiencing an abortion	32	60,4	21	39,6
Uterine contractions				
Strong	81	71,1	33	28,9
Weak	19	22,1	67	77,9
Education				
D3/S1/S2	36	59	25	41
SMA	47	48,5	50	51,5
JUNIOR	10	55,6	8	44,4
SD	7	29,2	17	70,8

Based on table 1. Most respondents who experienced placental retention were aged 20 to 35 years, representing 75 people (49.3%). Most of the pregnant women who did not experience placental retention were between 20 and 35 years old, representing 77 respondents (50.7%). Based on parity history, mothers who had never given birth were the most likely group to experience placental retention, as many as 43 respondents (43%). Taking into account the previous delivery history, mothers who had previously delivered vaginally were 34 times more likely to experience placental retention. Regarding mode of delivery, 86 respondents (81.9%) had experienced placental retention during normal delivery, most of whom were mothers. Most of the mothers had experienced miscarriage or placental retention (32 respondents, 60.4%). In addition, 19 women (22.1%) reported that their uterine contractions were weak and the placenta was retained. When viewed from the level of education, the majority of mothers who experienced placental retention were high school graduates, as many as 47 (48.5%) respondents.

Table 2.
Relationship between Maternal Age and Placental Retention Incidence (n=200)

Age	Occurrence of Placental Retention				Total		P-Value
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
<20th	1	25,0	3	75,0	4	100	
20-35	75	49,3	77	50,7	152	100	0,499
>35th	24	54,5	20	45,5	44	100	

Based on table 2. It shows that the pre-percentage of placental retention incidence in pregnant women is the highest at the age of 20 to 35, with a total of 75 respondents (49.3%) in maternity mothers who experience placental retention. The Chi-square statistical test results on the age variable, with a p-value of 0.499 (greater than 0.05), indicated that the null hypothesis (Ho) was accepted, while the alternative hypothesis (Ha) was rejected. This suggests that there is no significant relationship between age and the occurrence of placental retention.

Table 3.
Relationship between Parity and Placental Retention Incidence
(n=200)

Parity	Occurrence of Placental Retention				Total		P-Value
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
Nulipara	43	43,0	43	43,0	86	100	
Primipara	27	27,0	27	27,0	54	100	1,000
Multipara	30	30,0	30	30,0	60	100	

Based on table 3, it shows that as many as 43 respondents (50%) are mothers with nulipara parity, 27 respondents (27%) with primipara parity and 30 respondents (30%) are mothers

with multipara parity. The Chi-square test results yielded a p-value of 1.000, which is greater than 0.05. Therefore, the null hypothesis (Ho) is accepted, and the alternative hypothesis (Ha) is rejected, indicating that the findings are not statistically significant. This means that the difference in the proportion of placental retention incidence in each parity group is not strong enough to be said to be a real relationship.

Table 4.
Relationship between Previous Labor History and Placental Retention Incidence

Previous labor history	Occurrence of Placental Retention				Total		P-Value
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
Never given birth	28	84,8	5	15,2	33	100	0.000
Spontaneous delivery	34	65.4	18	34,6	52	100	
Caesarean delivery	23	24,0	73	76,0	96	100	
Curated	15	78,9	4	21,1	19	100	

Based on table 4. above, there were 28 respondents (84.8%) with a history of childbirth who had never given birth, 34 respondents (65.4) spontaneous delivery, 23 respondents (24%) who had a cesarean delivery, and 15 respondents (78.9) with curate. The chi-square statistical test yielded a P value of 0.000, which is less than the significance threshold of 0.05. This indicates a significant relationship between a history of previous childbirth and the occurrence of placental retention.

Table 5.
The Relationship Between Childbirth and Placental Retention

Types of childbirth	Occurrence of Placental Retention				Total		P-Value
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
Spontaneous delivery	86	81,9	19	18,1	105	100	0.000
Caesarean delivery	14	14,7	81	85,3	95	100	

Based on table 5. It shows that of the 105 respondents with spontaneous delivery who experienced placental retention events, 86 people (81.9%) were greater than those with spontaneous labor that did not experience placental retention events as many as 19 people (18.1%). The chi-square test yielded a P-value of 0.000, which is less than 0.05, indicating a significant association between the type of delivery and the occurrence of placental retention.

Table 6.
Relationship between History of Abortion and the Incidence of Placental Retention

History of abortion	Occurrence of Placental Retention				Total		P-Value
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
Not having an abortion	68	46,3	79	53,7	147	100	0.078
Having an abortion	32	60,4	21	39,6	53	100	

Based on table 6. It shows that of the 53 respondents with a history of abortion who experienced placental retention events, 32 people (60.41%) were greater than those with a history of abortion who did not experience placental retention events as many as 21 people (39.6%). The chi-square test revealed a P value of 0.078, which is greater than 0.05, indicating that there is no significant association between the type of labor and the occurrence of placental retention.

Table 7.
Relationship between Uterine Contractions and the Incidence of Placental Retention

Uterine contractions	Occurrence of Placental Retention				Total		*P-Value*
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
Strong	81	71,1	33	28,9	114	100	0.000
Weak	19	22,1	67	77,9	86	100	

According to the information presented in the table above, the results of bivariate analysis from 200 samples were obtained from mothers with strong uterine contractions with an incidence of placental retention as many as 81 (71.1%) and mothers with weak uterine contractions with an incidence of placental retention as many as 19 (22.1%). Meanwhile, mothers with strong contractions with an incidence of no placental retention were 33 (28.9%) and mothers with weak uterine contractions with an incidence of not placental retention were 67 (77.9%). The chi-square test yielded a P value of 0.000, which is less than 0.05, indicating a significant association between the type of labor and the occurrence of placental retention.

Table 8.
The Relationship between Education and the Incidence of Placental Retention

Education	Occurrence of Placental Retention				Total		*P-Value*
	Placental retensio		No placental retention				
	f	%	f	%	f	%	
D3/S1/S2	36	59	25	41	61	100	
SMA	47	48,5	50	51.5	97	100	0.091
JUNIOR	10	55.6	8	44.4	18	100	
SD	7	29.2	17	70.8	24	100	

The study findings revealed that most mothers who experienced placental retention events had completed high school or its equivalent, totaling 47 individuals (48.5%). In contrast, a smaller number of mothers had only an elementary education, with 7 individuals (29.2%). According to the results of the chi-square test, a P-value of 0.091 (greater than 0.05) was obtained, indicating that there is no statistically significant correlation between the type of delivery and the occurrence of placental retention.

DISCUSSION

The large number of cases of placental retention occurs due to various reasons, including age, parity, type of childbirth, uterine contractions, pregnancy distance, history of previous childbirth, history of abortion and history of education. According to Nur & Risalatul (2019) The postpartum period is a wonderful transition period for a father in his first experience. The findings also indicated that no significant correlation was found between age and the occurrence of placental retention, with a p-value of 0.499. Theoretically, the occurrence of placental retention is related to age. According to Dewi et al., (2022) The ideal age for a pregnant woman is in the range of 20 to 35 years, because during this period the uterus has reached maturity and is able to support the pregnancy well. In the realm of reproductive health, the period between the ages of 20 and 30 is regarded as the most optimal and safest for both pregnancy and childbirth. Pregnancy under the age of 20 is categorized as a high-risk pregnancy, because it can endanger the safety of the mother and baby. The causative factors are the immaturity of the reproductive organs and physiological functions at a young age, as well as limitations in emotional and psychological abilities, which can affect the acceptance of pregnancy and result in the process of pregnancy, childbirth, and the postpartum period. Mothers who are still less than 20 years old are still in the stage of growth and development,

so pregnancy makes her have to share a source of nutrition with the fetus she is carrying. In addition, insufficient uterus and pelvic size in adulthood can cause complications during childbirth and increase the risk of postpartum bleeding (Londero et al., 2019). The age considered ideal for a pregnant woman ranges from 20 to 35 years old. Meanwhile, the age under 20 years and above 35 years old is considered a more vulnerable period for pregnancy. Under the age of 20, physical conditions, especially those related to the reproductive organs and mental health, may not be fully prepared for the pregnancy and childbirth process (Rahayuningsih et al., 2021).

"The findings of this study align with the research conducted by Ulya et al., (2021) regarding "Age and Parity Factors on the Incidence of Placental Retention" which said that significantly that the mother's age had no effect on the incidence of placental retention with the results of the statistical test P=0.458. Meanwhile, the research conducted by Rahmawati (2023) Regarding "Factors Related to the Incidence of Placental Retention" which shows that the mother's age is less than 20 years and more than 35 years has an effect on the occurrence of placental retention with the results of the statistical test P=0.047. Pregnancy among adolescents is one of the significant health issues worldwide, as it can carry various risks to the health of mothers and babies. This condition not only affects physical well-being, but can also have an impact on psychological and social aspects, so it requires serious attention and treatment (Tarsikah et al., 2020).

For the parity variable, the p-value of 1.000, which is greater than 0.05, indicates that there is no statistically significant relationship between the two variables. This finding contradicts the theory that placental retention is more common in multipara and grandmultipara women. However, the outcomes of this study align with the research conducted by Vitriani (2018) which said that there was no association between parity and placental retention with a value of P= 0.213. The results of this study are not in line with Purwanti's research (2024) "The Relationship Between Parity and Placental Retention in Maternity at RRSUD Ruteng, Manggarai Regency, East Nusa Tenggara" which said that there was a significant relationship between parity and the incidence of placental retention with the outcome (p= 0.000). High-risk pregnancies are pregnancies in which the mother and fetus are sick, or the fetus is in danger of dying before delivery (Hariyanto & Rahayuningsih, 2023).

Other bivariate test results between previous labor history and placental retention events were the p-value obtained is 0.000, which is less than 0.05. This indicates that a significant correlation was discovered between the two variables, which aligns with the findings of Rahmawati's (2023) the statistical test results, with a P-value of 0.000, indicate a significant relationship between a history of cesarean delivery and the occurrence of placental retention. Researchers assume that a history of cesarean delivery increases the risk of placental retention. This is caused by trauma to the endometrium, which causes abnormalities in the attachment of the placenta, such as implantation in the lower segment of the uterus or above scar tissue due to cesarean section. This condition can cause various types of placental retention, ranging from the placenta adheren, accreta, to percreta. This aligns with the findings of a study carried out by Berampu (2018) entitled "Factors Related to Placental Retention in Maternity at Sidikalang Hospital, Dairi Regency in 2018" the results indicated a strong correlation between prior labor history and the occurrence of placental retention, with a p-value of 0.000. According to (Yuniarsih & Rahayuningsih, 2022), cesarean delivery requires good support from the husband.

The next variable studied is the type of childbirth. In this variable, the researchers discovered a notable correlation between the type of labor and the occurrence of placental retention. The statistical analysis revealed a p-value of 0.000, which is less than the 0.05 threshold, indicating a significant relationship. This suggests that the type of delivery that is carried out also affects the incidence of placental retention. Childbirth that involves certain procedures can carry a higher risk. One example is cesarean delivery, which is known to have a greater chance of causing placental retention. This condition may result in irregularities in how the placenta implants, potentially leading to complications like placenta accreta, increta, or percreta, all of which significantly raise the likelihood of placental retention. Scars that form on the uterine wall due to cesarean section can be an unusual location for placental implantation. When the placenta attaches to the scar area, the process of releasing the placenta after childbirth becomes more difficult and potentially causes placental retention. In addition, women who have had a cesarean section in their first delivery tend to have a higher risk of developing placental retention in later pregnancies. This shows the importance of proper monitoring and treatment for women who have a history of cesarean section. (Lathifatuzzahro et al., 2020) there is a relationship between pregnancy and childbirth history and placental retention with OR= results *2,348* (*CI 95%= 1.0245,390, p<0.05*). There are various changes in the body system during pregnancy (Citrawati & Arwidianan, 2023).

Curettage is a medical procedure whose goal is to remove tissue or residual tissue from the uterus using a curett spoon. The analysis of the data using the chi-square test revealed no significant association between a history of abortion and the occurrence of placental retention, with a p-value of 0.078, which is greater than 0.05. The findings indicate that the majority of mothers who give birth have no history of curettage, meaning that in previous pregnancies, they did not experience complications such as insipiens abortions, incomplete abortions, or missed fetal removals. In line with Desmansyah's research (2021) the analysis revealed that no significant association was found between a history of abortion and the occurrence of placental retention, with a p-value of 1.000 (greater than 0.05). According to the findings, the odds ratio (OR) was 1.3 (95% CI: 1,908.0), indicating that individuals with a history of abortion (categorized as "yes") have a 1.3 times higher likelihood of experiencing placental retention. Meanwhile, the results of research conducted by Alfitri & Subiastutik (2022) A significant correlation exists between a history of curettage and the occurrence of placental retention, with a p-value of 0.001, which is less than the 0.05 threshold.

The results of the study on the uterine contraction variable with the incidence of placental retention showed the results of the statistical test p-value 0.000. The results of this study are in line with the Lestari research (2019) suggests that there is a significant association between uterine dystentia and the incidence of placental retention *p-value* = 0.036. In a normal pregnancy, the myometrium undergoes cell differentiation, in which a series of adaptations allow the myometrium to proliferate and hypertrophy without undergoing contractions, since its contractility ability is disabled. This condition supports the growth and development of the results of conception as well as a gradual increase in amniotic fluid. Local contractions in the uterus will appear towards the end of pregnancy due to uterine distension. When there is excessive stretching of the uterus, this causes the uterus to be unable to adapt to the increase in volume.

The analysis results indicate that there is no significant correlation between the history of maternity education and the occurrence of population retention, as evidenced by a p-value of 0.091, which is greater than the 0.05 threshold. Meanwhile, the results of Permatasari's research (2017) the Chi-Square test results indicated a p-value of 0.003, which is less than

0.05, suggesting a significant relationship between education level and the occurrence of placental retention. Additionally, the odds ratio (OR) analysis revealed that individuals with lower levels of education were 6.5 times more likely to experience placental retention compared to those with higher education. The National Family Planning Program prioritizes the use of long-term contraceptive methods, but long-term contraceptive coverage is still low (Prastyoningsih et al., 2023). Cooperation in the postpartum period is important, with sufficient knowledge and education to help in the process (Nur & Risalatul, 2019). In maternal education, childbirth has a very strong effect on mothers after experiencing childbirth (Rahwanti Megasari & Betty Rahayuningsih, 2018). And the importance of maternal and family knowledge in childbirth is very important and influential (Setyandari & Rahayuningsih, 2023).

CONCLUSION

According to the findings derived from the analysis conducted in this study, it was shown that there was a meaningful relationship between labor history, type of childbirth, uterine contractions and the incidence of placental retention at Dr. Moewardi Surakarta Hospital in 2024. Meanwhile, other factors such as age, parity, history of abortion, and education did not have a significant relationship with the incidence of placental retention at Dr. Moewardi Surakarta Hospital in 2024. The results of this study underscore important insights in designing effective strategies to prevent and manage the incidence of placental retention during labor. More intensive interventions need to be focused on groups of mothers giving birth by maternal age, parity, history of abortion, and education.

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