Journal for Research in Public Health, 88-96
Volume 5 Number 2, January 2024
URL: https://jrph.org/

Determinants Of Retained Placenta At Malinau Hospital, North Kalimantan

Desi Marga Sinta*
Institut Ilmu Kesehatan STRADA Indonesia
***Corresponding author :** desimargasinta@gmail.com

ABSTRACT

Malinau Regency health profile data in 2018 recorded 268 deliveries, and 38 cases (14.1%) of them experienced retained placenta. Factors that cause retained placenta are placenta previa, caesarean section scar, repeated curettage, age, history of manual placenta, anemia, history of surgery and parity. Remaining placental remains in the uterus can cause weakened contractions which can cause postpartum bleeding. The aim of this study was to determine the determinants of the incidence of retained placenta in Malinau District Hospital, North Kalimantan.This research uses design *correlational research* with *cross sectional* approach. Respondents are recruited using *accidental Sampling* techniques with a sample of 36 people. Independent variables were parity and history of retained placenta. The dependent variable is incidence of retained placenta. Statistical test results using *chi square*.The research results showed that the majority of mothers giving birth at Malinau District Hospital had high parity, namely 23 (63.9%). The majority of mothers giving birth at Malinau Regional Hospital had a history of placental retention, 21 (58.3%), and the majority of mothers giving birth at Malinau Regional Hospital experienced placental retention, namely 25 (69.4%). The results of data analysis show that the significance level is $0.000 < \alpha = 0.005$ so that H_0 rejected and H_1 Thus, it is accepted that there is a relationship between parity and a history of placental retention with the incidence of retention at Malinau Regional Hospital, North Kalimantan.The conclusion in this research is mothers who have a history retained placenta and high parity tend to have a risk of retained placenta in the next delivery

Keywords: History Of Retained Placenta, Incidence Of Retained Placenta, Parity

BACKGROUND

The results of the Inter-Census Population Survey (ICPS) from 2015 to 2019 show that the MMR in Indonesia is 305 per 100,000 live births. Bleeding caused by placental abruption is the number one cause of death (40% - 60%) of maternal deaths in Indonesia (Anggrita, 2019). The number of maternal deaths in Malinau Regency in 2016 was 3 out of 47,541 live births, with the Maternal Mortality Rate (MMR) reported at 6 per 100,000 live births, meaning that out of 100,000 live births 6 mothers died during pregnancy, childbirth or postpartum. The biggest causes of death remain the same, namely bleeding (30.3%), hypertension (27.1%), infection (7.3%), prolonged labor (1.8%), abortion (1.6%) and others. (40%).

Malinau Regency health profile data, in 2016 there were 99 births recorded, with 15 cases of retained placenta (15.1%). Meanwhile in 2017 there were 93 births, with 20 cases of placental retention occurring (21.5%), and in 2018 there were 268 deliveries recorded, and 38 cases (14.1%) of them experienced placental retention. From these data it can be concluded

that the incidence of retained placenta is indeed decreasing, but the percentage of incidence is still high (above 10%) of all deliveries and the incidence of retained placenta is number 3 (three) of the causes of birth complications in Malinau Regency.(North Kalimantan Health Service, 2019).

Based on a preliminary study conducted at the beginning of February 2022 at the Malinau District Hospital of several mothers giving birth with cases of retained placenta where researchers conducted interviews with 10 mothers, it was found that 2 were primiparous and 8 were multiparous. There were 6 mothers with a history of retained placenta in previous deliveries.

Placental retention is when the placenta has not expelled for 30 minutes after the child is born and not all placental retention causes bleeding. If bleeding occurs, the action taken is to perform manual surgery on the mother's placenta. Most disorders of placental detachment are caused by disorders of uterine contractions. Bleeding due to weak uterine contractions after the child is born increases the incidence of pregnancy with excessive enlargement of the uterus in multiple pregnancies, the child's hydramnios are too large or the uterus has weakened contraction power such as Grande multipara, too close a pregnancy interval at an advanced age, Induction of parturition with oxytocin, His which is adequate so that the child is born too quickly using a vacuum or caesarean section and so on (Manuaba, 2016).

Factors that cause retained placenta are placenta previa, caesarean section scar, repeated curettage, and parity. Other factors that cause retained placenta are, age, history of manual placenta, anemia, history of uterine surgery endometrial destruction from previous infections or scars of endometritis and implantation.. The results of Anggrita's research (2019), showed that the incidence of retained placenta in risk parity was 79.2% and parity without risk was 39.4%. This means that there is a relationship between parity and the incidence of placental retention (p value 0.003 < 0.05). This is because mothers with high parity experience deterioration and defects in the endometrium which results in fibrosis at the site of placental implantation in previous births, resulting in reduced vascularization. To meet the nutritional needs of the fetus, the placenta will expand for implantation and the chorialis villi will penetrate the uterine wall deeper so that the placenta adhesiva reaches percreta.

Mothers who have a history of retained placenta during previous births because the endometrial wall to be deformed due to manual actions on the placenta that must be carried out. This causes injury to the endometrium, which can result in atrophic changes in the decidua and reduced vascularization, both of which can cause insufficient blood flow to the fetus and result in the placenta looking for a wider place and endometrium that is still good for implantation, namely in the lower segment of the uterus. so that it can cover part or all of the internal uterine ostium (Rukiyah, 2017).

A placenta that implants in a low position can cause the myometrium to fail to contract after delivery so that the uterus is fully relaxed, dilated, flaccid and unable to carry out the function of occluding blood vessels. As long as the placenta has not separated it will not cause bleeding and if part of the placenta has separated it can cause bleeding. Remaining placental remains in the uterus can cause weakened contractions. As a result, blood vessels that are open during the birth process cannot close quickly, which can cause post-partum bleeding (Rohani, 2016).

Malinau Regional Hospital is one of the referral hospitals in North Kalimantan Province, so many emergency cases occur at Malinau Regional Hospital. Health workers should be able to advise mothers to carry out regular antenatal care so that early detection complications can be prevented through ANC visits and motivating the family to maintain the mother's physical and stamina during labor so as not to cause risk factors for placental retention. If a woman has experienced retained placenta, there is a 35% chance that this incident will recur in the next pregnancy because the endometrial tissue from the previous pregnancy is no

longer in good condition. Therefore, it is hoped that mothers who have had a history of retained placenta in previous pregnancies can limit their pregnancies by following a family planning program. Based on the background above, the author is interested in researching the determinants of the incidence of retained placenta in Malinau Regional Hospital, North Kalimantan.

METHODS

The design of this research is *correlational research* with approach *cross sectional*. Respondents are recruited using techniques *accidental Sampling* with a sample of 36 people. Independent variables were parity and history of retained placenta. The dependent variable isincidence of retained placenta. Data processing through stages*editing, coding, scoring, tabulation*. The statistical test used is*chi square* with a value of $\alpha = 0.05$.

RESULT

1. General Data

Table 4.1

Frequency distribution of respondents based on education, pregnancy interval, and maternal age at Malinau Regional Hospital April-June 2022

Education	**F**	**%**
Elementary school	16	44.4
Junior high school	10	27.8
Senior high school	4	11.1
University	6	16.7
Total	**36**	**100**

Pregnancy interval (years)	**F**	**%**
< 2 or > 10	25	69.4
2-10	11	30.6
Total	**36**	**100**

Age (years)	**F**	**%**
≤ 20	19	52.8
21 - 35	13	36.1
>35	4	11.1
Total	**36**	**100**

Based on table 4.1, it is found that the majority of mothers had elementary school education, namely 16 (44.4%), the majority of mothers who gave birth had a pregnancy interval < 2 or > 10 as many as 25 (69.4%), and the majority of mothers who gave birth were ≤ 20 years old, namely 19 (52.8%)

2. Special Data

a. Parity

Table 4.2 Frequency distribution of respondents based on parity

Parity	**F**	**%**
Low	13	36.1
Height	23	63.9
Total	**36**	**100**

Based on Table 4.2 above, it is known that the majority of mothers giving birth had high parity, namely 23 (63.9%) at Malinau District Hospital in April-June 2022.

b. History of Retained Placenta

Table 4.3 Frequency distribution of respondents based on history of retained placenta

Retained placenta history	**F**	**%**
No	15	41.7
Of	21	58.3
Total	**36**	**100**

Based on Table 4.3 above, it is known that the majority of mothers who gave birth had a history of retained placenta, 21 (58.3%) at the Malinau District Hospital in April-June 2022.

c. Placental Retention Occurrence

Table 4.4 Frequency distribution of respondents based on the incidence of retained placenta

Placental Retention	**F**	**%**
No	11	30.6
Of	25	69.4
Total	**36**	**100**

Based on Table 4.4 above, it is known that the majority of mothers experiencing retained placenta, namely 25 (69.4%) in Malinau District Hospital in April-June 2022.

3. Cross Tabulation Results between Independent and Dependent Variables

a. Parity with Retention Events

Table 4.5 Cross tabulation of parity and incidence of retention

Parity	**Placental Retention**					
	Of		**No**			
	F	**%**	**F**	**%**	**F**	**%**
Low	10	76.9	3	23.1	13	**100**
Height	15	65.2	8	34.8	23	**100**
Total	**25**	**69.4**	**11**	**30.6**	**36**	**100**

Based on Table 4.5 above, it is known that the majority of mothers with high parity experienced placental retention, namely 15 respondents (65.2%) at the Malinau District Hospital in April - June 2022.

b. History of retained placenta with incident retained placenta

Table 4.6 Cross tabulation of history of retained placenta with incidence of retained placenta

Retplas history	**Placental Retention**					
	Of		**No**			
	F	**%**	**F**	**%**	**F**	**%**
Of	19	90.5	2	9.5	21	**100**
No	6	40	9	60	15	**100**
Total	**25**	**69.4**	**11**	**30.6**	**36**	**100**

Based on Table 4.6 above, it is known that the majority of mothers who had a history of retained placenta experienced an incident of retained placenta, namely 19 respondents (90.5%) at the Malinau District Hospital in April - June 2022.

4. Data Analysis

Table 4.7 Statistical Test Results

Statistical Test Results *Chi Square*	
Variable	Significance Level
Parity	0.000
History of retained placenta	

The results of data analysis show that the significance level is $0.000 < \alpha = 0.005$ so that H_0 rejected and H_1 Thus, it is accepted that there is a relationship between parity and a history of placental retention with the incidence of retention at Malinau District Hospital, North Kalimantan.

DISCUSSION

A. Parity of mothers giving birth at Malinau Regional Hospital, North Kalimantan

Based on Table 4.5 above, it is known that the majority of mothers giving birth at Malinau District Hospital have high parity, namely 23 (63.9%). Mothers who have ≥ 4 children are at higher risk of placental retention. This is in accordance with research by Anggrita (2019), which states that parity (multi/grande multipara) is a common causal factor in placental retention. In multiparas there is deterioration and defects in the endometrium which results in fibrosis of the former placental implantation in the previous birth, so that vascularization becomes reduced. To meet the nutritional needs of the fetus, the placenta will expand for implantation and the chorialis villi will penetrate the uterine wall deeper so that the placenta adhesive reaches percreta.Apart from that, in multiparas and Grande multiparas there is a decrease in uterine elasticity so that the myometrium cannot contract and retract optimally which results in placental retention.

However, the results of this study are not in line with the results of research by Elizabeth (2015), which showed that there was no relationship between parity and the incidence of placental retention ($p = 0.060 > \alpha = 0.05$). The discrepancy in the results of this study is that there is no relationship between parity with suspected retained placenta related to the nutritional status of pregnant women. The higher parity will be more likely for mothers Pregnant women suffer from iron deficiency. Deficiency Iron in the mother is a cause of anemia which can have an impact on the occurrence of placental retention in women giving birth. On the other hand, pregnant women with low parity have minimal potential for iron deficiency. The results of this research analysis showed that 66.7% of pregnant women with high parity did not experience retained placenta, possibly because pregnant women had sufficient nutritional needs, including Fe intake. In addition, pregnant women are able to access health services by having regular prenatal check-ups or ANC to detect early pregnancy risk factors and pregnancy complications. With early detection, it will be known whether the nutritional status of pregnant women is experiencing chronic energy deficiency (CED), anemia or not. Pregnant women who are found to be experiencing pregnancy complications will be treated immediately getting treatment and what not undergoing prevention. Pregnant mother when doing ANC get Fe tablets to prevent pregnancy anemia, so Retained placenta can be prevented.

Research by Riyanto (2015) states that at high parity there is also an increased risk of retained placenta in subsequent deliveries, this is because with each pregnancy fibrous tissue replaces muscle fibers in the uterus so that it can reduce contractility and blood vessels become more difficult to compress and cause adhesions. at the implantation site.

In the opinion of researchers, most mothers have a large number of children≥ 4 in Malinau Regency is because the mother does not want to use contraception to plan family planning (KB), and the mother/family believes that having many children is a magnet for sources of sustenance for parents. This is due to the mother's lack of knowledge. Based on table 4.1 above, it is known that the majority of mothers have elementary school education, namely 16 (44.4%) people. The level of education will influence knowledge. Mothers who have higher education are more active in determining their attitudes and are more independent in taking care. The low level of maternal education has an impact on the mother's low level of knowledge about obtaining health services. The lower the mother's knowledge, the less willing she is to use health services (Notoatmodjo, 2016).

B. History of placental retention of women giving birth at Malinau Regional Hospital, North Kalimantan

Based on table 4.6 above, it is known that the majority of mothers giving birth at Malinau District Hospital had a history of retained placenta, 21 (58.3%).You need to be wary of placental retention or placental adhesions in mothers with a previous history of placental retention. This is because abnormal placental adhesions can be caused by trauma to the endometrium due to previous manual placental procedures, causing abnormalities in placental adhesions ranging from placenta adhesiva, accreta, to percreta.

The results of this research are in line with research conducted by Ristu (2017) with statistical test results *chi square* The value of ρ = 0.046 was obtained, there was a relationship between the mother's history of pregnancy and childbirth and placental retention. A mother's history of pregnancy and childbirth also poses a high risk of bleeding. History of previous pregnancies such as miscarriage, repeated births at short intervals, surgical scars (*section Caesarea*), former placental manual action, and former *curettage* It could cause injury to the uterine organ which could affect future pregnancies.

Mothers with a previous history of retained placenta have a high chance of experiencing retained placenta, placenta accreta and increta in subsequent pregnancies and deliveries. Okta Vitriani's research results (2019) stated that a history of placental retention increases the risk of 15 times repeat placental retention in subsequent pregnancies (OR 15.22, 95% CI 3.30 – 70.19, p *value* less than 0,000).

In the researchers' opinion, mothers who have a history of retained placenta should be more careful in spacing pregnancies. The mother must be given sufficient time for the uterus to recover to its original state. Based on table 4.2 above, it is known that the majority of mothers giving birth at the Malinau District Hospital had a pregnancy interval < 2 or > 10 as many as 25 (69.4%) people. A short pregnancy distance or interval, namely less than two years, is one of the factors that will influence the occurrence of placental adhesions. This is due to uterine contractions becoming weaker so that the placenta remains inside *uterine cavity*. The risk of placental adhesions also occurs in deliveries more than 10 years apart. In this condition, smooth muscle *uterus* becomes stiff and contracted *uterus* become less good as if facing the first childbirth again, so it is easy to happen *placental retention*(Manuaba, 2016).

C. The incidence of retained placenta at Malinau Regional Hospital, North Kalimantan

Based on Table 4.7 above, it is known that the majority of mothers giving birth at Malinau District Hospital experienced placental retention, namely 25 (69.4%). It can be seen that there were 25 cases of retained placenta from 36 deliveries that occurred in April-June 2022 at Malinau Regional Hospital, North Kalimantan. Most of them are referral cases from midwives, community health centers or other health service facilities. The large number of cases of retained placenta can happen due to various reasons. One of them is the characteristics of the birthing mother herself, such as the mother's age, education, parity, pregnancy spacing, and also history of previous births.

According to Saifuddin (2016), placental retention can be caused by various factors, namely maternal factors such as parity, maternal age and uterine factors such as a history of placental retention and a history of endometritis. In normal, the decidua basalis is located between the myometrium and the placenta. The cleavage plate for separation of the placenta is in the sponge-like decidua basalis layer. A pathophysiological condition that causes retained placenta, because the decidua basalis is partially or completely absent, so that the placenta attaches directly to the myometrium. The villi can remain superficial to the uterine muscle or can penetrate deeper. This situation does not occur because of the abnormal invasive nature of the trophoblastic but because of a defect in the decidua. In the superficial area of the myometrium, a large number of venous channels grow under the placenta. Ruptura of these sinuses which occurs when the placenta is forcibly expelled will cause large amounts of bleeding.

In the researcher's opinion, the incidence of retained placenta in this study could occur because the mother's age is at high risk (< 20 years / > 35 years). Based on table 4.3 above, it is known that the majority of mothers who gave birth at the Malinau District Hospital were ≤ 20 years old, 19 (52.8%) people. The results of interviews with several respondents showed that older mothers≤ 20 year olds are more likely to experience retained placenta due to lack of local community knowledge about childbirth, there are still many mothers at risk of becoming pregnant at this age.≤ 20 years and a small percentage of births are assisted by traditional birth attendants where placental retention has occurred. Meanwhile, for mothers who are >35 years old, some people still have an understanding of the importance of sons or daughters in a family and some people believe that having lots of children brings a lot of fortune, so at the age of >35 years many mothers are still pregnant.

D. Analyzing parity factors and history of retained placenta with the incidence of retained placenta at Malinau District Hospital, North Kalimantan

The results of data analysis show that the significance level is $0.000 < \alpha = 0.005$ so that H_0 rejected and H_1 Thus, it is accepted that there is a parity relationship with the incidence of retention at Malinau District Hospital, North Kalimantan. Placental retention is when the placenta is not born half an hour after the fetus is born, a strong implantation between the placenta and the uterus is the cause of placental retention. WHO (2016) states that if the placenta is not successfully delivered within 30 minutes after giving birth to the baby, then the patient who experiences this condition must be diagnosed as a case of retained placenta. In cases without bleeding, women who have just given birth should be observed for another 30 minutes after the first 30 minutes before attempting to deliver the placenta manually.

According to Hirokazu Naoi (2016) placental retention can be experienced by 0.6 to 3.3 percent of normal births. Retained placenta is a potentially life-threatening condition and a common cause of maternal death from postpartum hemorrhage. It affects 0.5% – 3.3% of women after vaginal delivery. This opinion is in accordance with the results of research which found that 69.4% of the total number of mothers who gave birth experienced retained placenta at the Malinau District Hospital in 2022.

In this study, many respondents were found at a high risk age because there was a mindset that was still influenced by social culture, improvements in socio-economic status and education, thus creating a trend of early marriage ages. Postpartum hemorrhage which results in maternal death in pregnant women who give birth at the age of under 20 years is 2-5 times higher than postpartum hemorrhage which occurs at the age of 20-29 years. The results of this study also show that risk parity (≥ 4) has a 3 times greater risk of placental retention, this is in accordance with the theory that high parity has a higher incidence of postpartum hemorrhage, this is related to the reproductive function of mothers who experience decreased due to frequent pregnancy or childbirth and frequent pregnancy or childbirth causes scarring of the uterine

wall. If the placenta is attached to the scar, the placenta will implant very strongly, so placental retention is likely to occur (Manuaba, 2016).

The results of data analysis show that the significance level is $0.000 < \alpha = 0.005$ so that H_0 rejected and H_1 Thus, it is accepted that there is a relationship between the history of placental retention and the incidence of retention at Malinau District Hospital, North Kalimantan. Women with a history of retained placenta in previous deliveries will experience scarring on the uterus, thereby increasing morbidity and mortality in subsequent pregnancies and deliveries.

Based on the above, researchers are of the opinion that the mother has a history complications in childbirth then have tendency to experience complications at the next birth. Several respondents with a history of retained placenta experienced retained placenta during the current birth, this was because the respondents did not know what the safe birth distance was for their next pregnancy. Respondents consider that pregnancy is a gift from God, so there is no need to postpone it. Based on Table 4.9, results were obtained from 19 respondents with a history of placental retention, 2 respondents did not experience placental retention, and this is because the mother has experience of previous pregnancy and childbirth. Mothers learn that the circumstances of labor are influenced by how the mother maintains her health during pregnancy. Mother said that she had her pregnancy checked regularly by a midwife/doctor, that she maintained her nutritional intake and took vitamins. Previous bad birth experiences make mothers learn and don't want to repeat it again. Family support also helps mothers in their labor now. This makes mothers motivated and enthusiastic about maintaining pregnancy for the sake of the health of the baby and herself.

CONCLUSION

Based on the research results, it was concluded that the majority of mothers giving birth at Malinau District Hospital had high parity, as many as 23 (63.9%). The majority of mothers giving birth at Malinau Regional Hospital had a history of placental retention, 21 (58.3%), and the majority of mothers giving birth at Malinau Regional Hospital experienced placental retention, namely 25 (69.4%). The results of data analysis show that the significance level is $0.000 < \alpha = 0.005$ so that H_0 rejected and H_1 Thus, it is accepted that there is a relationship between parity and a history of placental retention with the incidence of retention at Malinau District Hospital, North Kalimantan. It is recommended that local health agencies can provide guidance for midwives regarding the management of retained placenta which must be in accordance with standard operational procedures, midwives can carry out screening for predisposing factors for placental retention and standard and quality antenatal care services by sharing knowledge among midwives. Apart from that, pregnant women with high parity are expected to carry out antenatal care at least 6 times according to standards, maintain a balanced nutritional intake, and plan their next pregnancy well so as to prevent placental retention.

REFERENCE

Anggrita, Faizah, Vira. 2019. Hubungan umur, paritas dan manajemen aktif kala III dengan retensio plasenta di Rumah Sakit Umum Daerah Tamiang Layang: Sebuah Studi Kasus Kontrol. Dinamika Kesehatan, Vol. 5 No. 2 Desember 2014. 10.

Depkes RI. “Profil Kesehatan Indonesia Tahun 2015”. Jakarta : Depkes RI : 2015. Diakses pada tanggal 7 Februari 2022.

Dinas Kesehatan Kabupaten Malinau. 2019. Profil Kesehatan Kabupaten Malinau.

Diskes Kaltara. 2019. “Profil Kesehatan Provinsi Kalimantan Utara..

Elizabeth M et al. 2015. Risk Factors for Retained Placenta. American Journal of Obstetrics and Gynecology (2015), doi: 10.1016/j.ajog. 2015.07.039.

Favilli A, *et al*. 2018. *Risk factors analysis and a scoring system proposal for the prediction of retained placenta after vaginal delivery*. European Journal of Obstetrics & Gynecology and Reproductive Biology.

Hirokazu Naoi, dkk, 2016. *Investigation of the Prognosis of 28Patients with Retained Placenta After Delivery*. *Journal of Gynecology and Obstetrics*. Vol. 4, No. 2, 2016, pp. 7-11.

Jenderal Sekretariat Kementerian Kesehatan RI. Profil Kesehatan Indonesia tahun 2015. Jakarta: Kementerian Kesehatan RI 2016

Kementrian Kesehatan RI. 2017. "Profil Kesehatan Indonesia 2017"..

Manuaba, I.B.G, 2016. Gawat Darurat Obstetri Ginekologi dan Ginekologi Sosial untuk Profesi Bidan. Jakarta : EGC 9.

Notoatmodjo, S. 2016. *Metodologi Penelitian Kesehatan*. Jakarta :Rineka Cipta

Prawirohardjo, Sarwono, 2015. Buku Acuan Nasional Pelayanan Kesehatan Maternal dan neonatal. Jakarta : PT. Bina Pustaka 2014. 11.

Ristu, Lina, Nurul. 2017. Hubungan antara umur dengan kejadian retensio plasenta pada ibu bersalin: Sebuah Studi Kasus Kontrol dan Survey Analytik. Jurnal Darul Azhar, Vol 3. No. 1 Februari 2017-Juli 2017 : 44 - 48 17.

Riyanto. 2015. Faktor risiko kejadian retensio plasenta pada ibu bersalin di RSUD dr. H. Bob bazar, Kalianda. Jurnal Kesehatan Metro Sai Wawai Volume VIII No. 1 Edisi Juni 2015 ISSN: 19779-469X

Rochjati, Poedji. 2016. Skrining Antenatal pada Ibu Hamil. Surabaya: Pusat Penerbitan dan Percetakan Unair (AUP).

Rukiyah & Yulianti, 2017**. Asuhan Kebidanan IV (Patologi)** : CV Trans Info Media Jakarta

Rohani, dkk. 2016. Asuhan Kebidanan Pada Masa Persalinan. Jakarta: Salemba Medika. 13. Wikjosatro. Ilmu Kebidanan. Jakarta Yayasan Bina Pustaka Prawirohardjo,

Saifuddin, Abdul Bahri, dkk. 2016. Buku Acuan Nasional Pelayanan Kesehatan Maternal dan Neonatal. Jakarta: Bina Pustaka

Varney, Helen. 2010. Buku Ajar Asuhan Kebidanan Edisi 4. Jakarta : EGC

WHO. 2016. "Maternal mortality ratio (per 100 000 live births)". WHO recommendations on antenatal care for a positive pregnancy experience, UK.

Wiknjosastro, Hanifa. 2018. *Ilmu*