

## Literature Study: Analysis of the Relationship Between Age and the Incidence of Postpartum Hemorrhage in Maternity Mothers

Tatut Isna Winanda Putri Pratiwi\*, Indah Ayu Afsari, Syifa'ul Lailiyah

Universitas Airlangga, Jl. Dr. Ir. H. Soekarno, Surabaya, East Java, 60115, Indonesia

\*Authors correspondence, Email address: tatut.isna.winanda-2018@fkm.unair.ac.id

ARTICLE INFO	ABSTRACT
<b>ORCHID ID</b> Author 1: <a href="https://orcid.org/0000-0001-8696-5062">https://orcid.org/0000-0001-8696-5062</a> Author 2: - Author 3: -	Postpartum hemorrhage is the leading cause of maternal death worldwide with an incidence of 5 – 10 percent of all deliveries. Data shows a downward trend in maternal mortality in Indonesia in 1991 from 390 to 230 in 2020 per 100,000 live births. Maternal mortality is an important concern because being one of the indicators of health status and the success of health development, the reduction in maternal mortality rate is also a target in the Sustainable Development Goals (SDGs). In the SDGs, the target of reducing the maternal mortality rate is 70 per 100,000 live births by 2030. The preliminary study found cases of postpartum hemorrhage with risk age less than 20 years as many as 90 people (6.2 percent), bleeding with age more than 35 years as many as 40 people (2.7 percent). The purpose of this study was to conduct a literature study on the relationship between maternal age and postpartum hemorrhage. This study used 13 national journals obtained through Google scholar and Garuda (Digital Referral Guard). Based on the results of the study, 10 journals stated that there was a significant relationship between maternal age and postpartum hemorrhage, while 3 other journals showed that there was no significant relationship between maternal age and postpartum hemorrhage.
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### 1. Introduction

The maternal mortality rate by province in 2018-2019 was 4,221 maternal deaths in Indonesia, based on reports the most common cause of maternal death was bleeding with 1,280 cases (Nafisah, 2021). Postpartum hemorrhage is the main cause of maternal death, it is estimated that there are 14 million cases of bleeding in pregnancy each year, at least 128,000 women experience bleeding to death. In the US from 2005 to 2008, the prevalence of postpartum hemorrhage increased by 28%. Postpartum hemorrhage increases the likelihood of in-hospital death and accounts for 19% of in-hospital maternal deaths. Based on research by Kristianingsih et al., (2019), which was carried out at Pringsewu Hospital in 2019 found 76.58% of cases of postpartum hemorrhage, with factors causing Uterine Atonia of 39.9%, Retention of Placenta of 52.5%, and uterine lacerations of 41%. WHO shows that every year about 14 million women in the world suffer from vaginal bleeding after giving birth. Based on data from the World Health Organization, the possibility of maternal death due to postpartum hemorrhage is 1 in 1000 deliveries in developing countries, including Indonesia (Yanti & Lilis, 2022). Based on data available at the General Hospital (RSU) Anutapura Palu, data were obtained in 2015, namely the total number of deliveries was 2,204 deliveries with 54 cases of bleeding and the increase in cases in 2016 was 68 cases of bleeding with a total of 2,438

deliveries. In 2017 the total number of deliveries was 2,356 with a total of 64 cases of bleeding (Nur et al., 2019).

The data shows a downward trend in the maternal mortality rate in Indonesia in 1991 from 390 to 230 in 2020 per 100,000 live births (Kusnandar, 2021). Based on Indonesia's health profile in 2014, there were four causes of postpartum hemorrhage, namely bleeding 30.3%, hypertension in pregnancy 27.1%, infection 7.3%, and others such as diseases suffered by the mother of 35.3% (Kementrian Kesehatan RI, 2014). The maternal mortality rate is an important concern because it is an indicator of the degree of health and the success of implementing health development. Apart from being an indicator of the degree of health and the success of implementing health development, the reduction in the Maternal Mortality Rate is also a target in the Sustainable Development Goals (SDGs). In the SDGs the target for reducing the Maternal Mortality Rate is 70 per 100,000 live births by 2030 (Susiana, 2019).

Postpartum hemorrhage is a major cause of maternal death worldwide with an incidence of 5% - 10% of all deliveries. Postpartum hemorrhage can be defined as blood loss of 500 ml or more after delivery of the fetus and placenta in vaginal delivery or 1000 ml or more in cesarean section delivery (Simanjutak, 2020). Based on the results of the preliminary study that has been done, obtained data from the maternity ward register at Panembahan Senopati Hospital, it is known that the number of vaginal deliveries from January to June 2013 was 1446 people. Of these, there were 198 cases of postpartum hemorrhage (13.6%). Bleeding with age <20 years as many as 90 people (6.2%), bleeding with age > 35 years as many as 40 people (2.7%) and bleeding with ages 20-35 years as many as 29 people (2%) (Anjelin, 2015). Some conditions that can put pregnant women at risk for complications during pregnancy and childbirth include pregnant women suffering from diabetes, hypertension, malaria, too four (too young 35 years, too close, too many children) and anemia, namely hemoglobin levels.

## 2. Method

The research design used was the literature review method. The keywords and Boolean operators in this search are “Postpartum Hemorrhage AND Age AND Pregnancy Complications”. The purpose of this study was to find out the results of previous studies and to deepen knowledge related to the analysis of the relationship between maternal age and the incidence of postpartum hemorrhage in pregnant women. The data sources used in this study are the Google Scholar and Garuda (Digital Reference Garda) databases with a range of journal publication years between 2015 - 2019. The framework used in this study uses the PICOS Framework strategy in Table 1.

**Table 1. PICOS Framework Strategy**

Criteria	Alternative 1	Alternative 2	Alternative 3
Population	Maternity Mother	Maternity with pregnancy complications	Mothers who experience pregnancy complications at risky ages (<20 years and >35 years)
Intervention	-	-	-
Comparison	-	-	-
Outcomes	Postpartum Bleeding	Postpartum Bleeding	Postpartum Bleeding
Study design	Quantitative	Quantitative	All Study Types

Through the Google Scholar and Garuda databases, based on keywords, 1382 journals were found. Then the journals were selected, there were 97 journals that had to be excluded because they were published under 2015. Then 375 journals had to be excluded because researchers had to filter journals based on the topics raised. Of the remaining 250 journals, researchers screened journals with abstract identification, and 194 journals had to be excluded. And the remaining 56 journals, 46 journals must be excluded, then the researchers took 13 journals to be reviewed based on research results which showed a relationship between age and postpartum hemorrhage. Figure 1 explain the flow of selection of research journals.

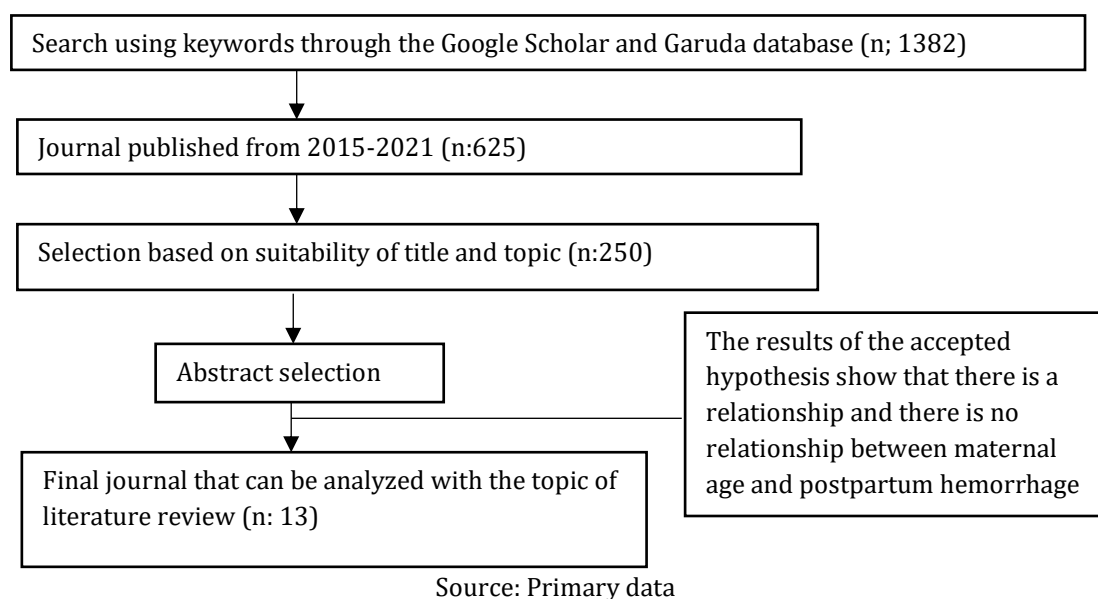


Figure 1. Research journal selection flow

### 3. Result and Discussion

Literature review the data used is grouped with similar data according to the results that are considered to be able to answer the objectives by using the narrative method. Journals that are in accordance with inclusion are collected into one and summarized including the name of the researcher, year of publication, title, method and research results as well as the database from which the journal was taken. Table 2 explain the research result.

Table 2. Research Result

No	Writer	Study Design	Sample	Variable	Instrument	Research result
1.	(Surani & Wahyuni, 2019)	Descriptive Analytic, Case Control approach	total sampling	Age, Polyhydramnios, and the incidence of postpartum hemorrhage	Medical record data of RSI Sultan Agung Semarang in 2016-2017	Based on the results of the study using odds ratio analysis, it showed that 24 respondents with at-risk ages (<20 years or >35 years) had a 2.49 times greater risk of experiencing postpartum hemorrhage compared to mothers aged 20-35 years.

No	Writer	Study Design	Sample	Variable	Instrument	Research result
2.	(Mariyani & Lestari, 2017)	Analytic, cross-sectional approach	total sampling	Age, Education, Occupation, Parity, Incidence of postpartum hemorrhage	Medical record data of Bekasi District Hospital	Based on the results of the study, there were 60 mothers who experienced postpartum hemorrhage, including 38 people (63.3%) who were mothers at risk and 22 people (36.7%) who were mothers who were not at risk. The results using the chi square statistical test obtained a p value <0.05, which means that there is a significant relationship between age and the incidence of postpartum hemorrhage.
3.	(Zulfi et al., 2019)	Analytical Observational, case control approach	total sampling	Age, parity, and incidence of postpartum hemorrhage	Ulin Hospital Banjarmasin medical record data	Based on the results of the study with the results of the chi square test, a p value <0.05 was obtained, this indicated that there was a relationship between age and postpartum hemorrhage. The results of the odds ratio were 18.619, this shows that mothers who give birth with age <20 years or >35 years have a risk of 18.619 times to experience postpartum hemorrhage
4.	(Manik & Susanti, 2019)	Analytical Observational, case control approach	total sampling	Age, Parity, Anemia, Incidence of Postpartum Bleeding	Medical record data at Raden Mattaher Hospital, Jambi Province	Based on the results of the study, it showed that age at risk had a significant relationship with the incidence of postpartum hemorrhage. Maternity mothers aged <20 years or >35 years have a 4.109 times greater risk of experiencing postpartum hemorrhage.
5.	(Ummah et al., 2018)	Analytic, case control retrospective approach	total sampling	Mother's Identity, Age, Parity, Anemia, and Prolonged Labor	Pamotan Health Center medical record data, Rembang Regency	Based on the results of the study, it was found that mothers with at-risk ages (<20 years and >35 years) were 3.7 times more likely to experience postpartum hemorrhage compared to mothers aged 20-35 years. This shows that there is a relationship between age and postpartum in mothers giving birth.

No	Writer	Study Design	Sample	Variable	Instrument	Research result
6.	(Rahmawati, 2017)	Analytic, case control retrospective approach	Purposive sampling	Age, and Incidence of Postpartum Hemorrhage	Medical record data of the Ramlah Parjib Clinic Samarinda for the period January 2015 – April 2016	Based on the results of the study, the results of statistical tests were obtained with a p value of 0.03 <0.05, which means that there is a significant relationship between age and postpartum hemorrhage. Maternity mothers with a risky age have a 0.500 times greater risk of postpartum hemorrhage compared to women who are not at risk.
7.	(Krisnamurti, 2015)	Case Control	total sampling	Age, and Incidence of Postpartum Hemorrhage	Hospital medical record data dr. Mohammad Hoesin Palembang Period 1 January 2013 – 31 December 2013	Based on the results of the study, the results of the statistical test showed that the p value was 0.016 <0.05. This shows that there is a significant relationship between age and postpartum hemorrhage. Mothers of at-risk age will have a 2.503 times greater risk of experiencing postpartum hemorrhage than mothers of non-at-risk age
8.	(Yusriana, 2017)	Descriptive Analytic, Case Control approach	Total sampling and control samples	Age, parity, gestation interval, Hb level and Post Partum Bleeding Incidence	: Medical record data at PKU Muhammad iyah Hospital, Bantul	The results showed that the results of statistical calculations obtained an odds ratio of 50.091. This shows that mothers with a risky age will have a 50.091 times greater risk of experiencing postpartum hemorrhage compared to mothers who are not at risk.
9.	(Isnawati & Rokhanawati, 2017)	Correlation studies, Case Control approaches, and retrospective time approaches.	Simple random sampling	Age, history of preeclampsia and Postpartum Hemorrhage	Medical record data at PKU Muhammad iyah Hospital, Bantul	The results showed that the results of statistical test calculations found a p value of 0.039 <0.05. This shows that there is a significant relationship between age and postpartum hemorrhage. The odds ratio is 3,000, which means that women of at-risk age have a 3 times greater risk of experiencing postpartum bleeding than mothers who are not at risk.

No	Writer	Study Design	Sample	Variable	Instrument	Research result
10	(Bakri et al., 2019)	Retrospective Analytics, Case Control approach	Simple random sampling	Age, parity, birth spacing and Postpartum Hemorrhage	Merangin district health office data	Based on the results of the study, it was found that the results of statistical calculations found a p value of $0.001 < 0.05$ . This shows that there is a significant relationship between age and postpartum hemorrhage. Then the results of an odds ratio of 3.636 were found, which means that women of at-risk age have a 3.636 times greater risk of experiencing postpartum hemorrhage compared to mothers who are not at risk.
11	(Dinayanti & Rohmah, 2018)	Case Control	total sampling	Age, parity, anemia, history of CS, and Postpartum Hemorrhage	Medical record data for mothers giving birth at Sleman Hospital in January-December 2016-2017	Based on the results of the study using chi-square analysis, it showed that the p-value was $0.454 > 0.05$ . This means that there is no relationship between age and postpartum hemorrhage
12	(Pitriani, 2017)	Case control	total sampling	Age, parity, occupation and Postpartum Hemorrhage	Medical record data at Arifin Achmad Hospital, Camar II Room, Riau Province	Based on the results of the study showed that there was no significant effect between age and the incidence of postpartum hemorrhage in mothers giving birth. This is evidenced by the results of statistical tests which show a p-value of $0.106 > 0.05$ .
13	(Friyani et al., 2015)	Cross Sectionals	total sampling	Age, parity, education and Postpartum Bleeding	Hospital medical record data Dr. M. Djamil Padang	Based on the results of the study showed that there was no significant relationship between age and the incidence of postpartum hemorrhage in mothers giving birth. This is evidenced by the results of statistical tests which show a p-value of $0.253 > 0.05$ , which means that there is no significant relationship between age and postpartum hemorrhage in mothers.

Based on 13 journals that have been reviewed, it can be proven correctly that age is related to the incidence of postpartum hemorrhage in mothers who give birth. Age at risk, namely mothers with age < 20 years or > 35 years. According to Setiawan (2021), for pregnant and giving birth ideally for women is at the age of 20-35 years. This age is a low-risk age in the female reproductive process, this is due to the age of less than 20 years the development of the uterus and the mother's pelvis is not mature enough to become a mother, whereas at the age of 35 years and over the elasticity of the pelvic muscles and has experienced setbacks reproductive organs so that it can complicate the birth process and can further cause death in the mother. If a woman wants to have prime reproductive health, should be able to pay attention and avoid "4 too" where two of them are related to the mother's age. The first T is too young, meaning pregnant at the age of less than 20 years. The risks that may occur if pregnant under 20 years include miscarriage, preeclampsia (high blood pressure, edema, proteinuria), eclampsia (pregnancy poisoning), labor difficulties due to immature reproductive system, premature birth, low birth weight (LBW), vesicovaginal fistula (seepage of urine into the vagina), retrovaginal fistula (gas and stool discharge from the vagina) and cervical cancer, the second T is too old meaning pregnant over the age of 35 years is a predisposing factor for postpartum bleeding which results in maternal death (Cintania, 2020). At the age of more than 35 years, the muscles of the pelvic floor are no longer elastic, so complications can easily occur during pregnancy and childbirth, such as preeclampsia, hypertension, diabetes mellitus, anemia which can also result in premature or low birth weight births (Susanti, 2020). The research results are in line with previous research by Komariah & Nugroho (2019), showed that bivariate results showed that there was a relationship between maternal age and pregnancy complications, the more at risk the mother's age, the higher the incidence of pregnancy complications. These results are supported by research on Mariyona (2019), out of 3 pregnant women of at-risk age (over 35 years) 1 pregnant woman experienced pregnancy complications, while 2 other pregnant women did not experience pregnancy complications. This research is in line with research on Sari (2015), showed that 19 respondents with a risk age of <20 years and >35 years and 15 respondents with an age not at risk of experiencing postpartum hemorrhage. The statistical results obtained were a p-value of 0.000 <0.05. This shows that there is a significant relationship between age and postpartum hemorrhage. With the acquisition of an odds ratio of 7.347, which means that those aged <20 years and >35 years have a 7.347 times greater risk of experiencing postpartum hemorrhage compared to mothers who are not at risk.

However, the 3 other journals reviewed stated that there was no significant relationship between maternal age and the incidence of postpartum hemorrhage in mothers giving birth with evidence of calculating the p-value statistical results greater than  $\alpha = 0.05$ . These results are in line with research Sanjaya & Fara (2021), For all birth mothers in Cahaya Mas Village in 2019, a total of 33 people obtained a p-value of 0.371 > 0.05, which means there is no relationship between age and postpartum hemorrhage. This can happen for several reasons. The first is mother's education and behavior, pregnant women know that they are at risk of experiencing postpartum hemorrhage, so they should check their uterus and health conditions more often in health care facilities to reduce the risk of postpartum hemorrhage. Second, providing good information to the public is also an important factor in tackling the incidence of postpartum hemorrhage. Community knowledge will increase and will be followed by public awareness to minimize the risk of pregnancy.

#### 4. Conclusion

The conclusion in this study is that age is significantly related to the incidence of postpartum hemorrhage. Especially in the age group at risk for mothers giving birth (<20 years and >35 years). The risk at this age is higher than the non-risk age (20-35 years) for mothers giving birth. Because at the age of <20 years the reproductive organs are not yet fully ripe for pregnancy readiness, so that it can have an adverse impact on the health of the mother or the fetus she contains. If pregnancy occurs at an age that is too old > 35 years, the function of the reproductive organs has decreased, the quality of the eggs produced is also not good, and there are many risks to the mother or the fetus they contain. Other risks that may occur are abnormal births such as birth defects, risk of miscarriage,

The suggestions that researchers can give based on the explanation above are that pregnant women are expected to prepare themselves before pregnancy occurs. By improving unfavorable health conditions that can trigger postpartum hemorrhage. Prepare well for nutritional needs before, during and after pregnancy so as to minimize the risk of LBW. Preparing the body in good condition, and optimal in order to minimize the risk of pregnancy complications or even maternal death. Regular check-ups for pregnancy or antenatal care at a health facility so that the condition of the pregnancy can always be controlled and if there are signs of pregnancy problems to be treated immediately.

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