Literature review

THE RISK FACTORS INFLUENCING ABORTION: A LITERATURE REVIEW

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Abstract

Background: In general, the five leading causes of maternal mortality are bleeding, Hypertension in Pregnancy (HDK), infection, prolonged labor or obstructed labor, and abortion. Maternal mortality in Indonesia is still dominated by three main causes: bleeding, HDK, and infection. However, the proportions have changed, with bleeding and infection showing a tendency to decrease, while HDK has been on the rise. More than 25% of maternal deaths in Indonesia in 2017 were caused by HDK.

Objective: This literature review aims to identify the risk factors influencing the occurrence of abortion.

Method: This study employed a literature review method based on data from various electronic databases within the last five years, including Academic Search Complete, Proquest, Pubmed, EBSCO, and Google Scholar. A total of 7 articles were selected that met the criteria and were published in both Indonesian and English.

Results: It showed a significant relationship between the age of pregnant women and the incidence of abortion ($p<0.05$). There is a significant relationship between parity and the incidence of abortion ($p<0.05$). A significant relationship exists between the distance between pregnancies and the incidence of abortion ($p<0.05$). There is a significant relationship between the mother's health history and the incidence of abortion ($p<0.05$).

Conclusion: The factors causing the incidence of abortion include age, parity, pregnancy spacing, and the mother's health history. Preventive measures include avoiding pregnancy at a young age (<20 years) because, from a biological standpoint, the reproductive organs have not fully developed, and at an older age (>35 years), the elasticity of the pelvic muscles and surrounding area, as well as the reproductive organs, generally have diminished. Women in this age range are at a higher risk of experiencing antenatal complications, including abortion.

Keywords: Abortion, Maternal Age, Parity, Pregnancy Spacing, Maternal Health History, literature review.

Background

Results from various surveys in Indonesia, including information on maternal health services such as the Indonesian Demographic and Health Survey (SDKI) and the Basic Health Research (Riskesdas), indicate that the coverage of various maternal health service indicators shows a trend of improvement (BKKBN et al., 2008-2018, Health Research and Development Agency, 2010-2018). Various maternal health service programs, such as antenatal care (ANC), assisted delivery by health personnel, and delivery in healthcare facilities, all aim to improve maternal health status. One of the indicators of maternal health status is the maternal mortality rate (NMR). NMR in Indonesia remains high, at 305 per 100,000 live births according to the 2015 Inter-Census Survey (SUPAS) (BPS, 2016). An analysis of global maternal mortality trends from 1990 to 2015 reported by the World Health Organization (WHO) and other donor agencies indicated that Indonesia's MMR is

among the three highest in Southeast Asia. Despite improvements in healthcare coverage, neonatal mortality significantly contributes to two-thirds of infant deaths, and similarly, the infant mortality rate (AKB) contributes to two-thirds of child mortality. The Neonatal Mortality Rate (NMR) is a target of the Sustainable Development Goals (SDGs) related to goal 3, where the mother's condition influences neonatal deaths during pregnancy and preconception. As a nation that has agreed to the SDGs, the Ministry of Health is responsible for accelerating the reduction of MMR and NMR, which aligns with SDGs target 3 to reduce MMR to 70 per 100,000 live births by 2030. A decrease of 9.5% per year is necessary to achieve this target, while the trend in maternal mortality decrease over the past decade has been around 2.5%.

In Aceh Province, the MMR in 2018 reached 141 cases from 101,296 live births. Meanwhile, the NMR ratio in Aceh decreased to 139 per 1,000 live births. Data from the Banda Aceh Health Profile showed that the MMR in Banda Aceh in 2017 was 35 per 100,000 live births, representing a slight decrease compared to 2016 at 37 per 100,000 live births. In 2015, the MMR was 114 per 100,000 live births, down from 2014 at 92 per 100,000 live births and from 2013 at 119 per 100,000 live births. The five leading causes of maternal mortality in Indonesia remain bleeding, Hypertension in Pregnancy (HDK), infection, prolonged labor or obstructed labor, and abortion.

Subject And Method

This literature review aims to determine the influence of factors affecting the risk of miscarriage based on several previous articles, such as literature on maternal age, parity, spacing between pregnancies, and maternal health history that may impact the risk of miscarriage. The type of data in this study is secondary data. The secondary data refers to data obtained from previous research conducted by other researchers. The sources of the articles used are obtained from academic search Complete, Proquest, Pubmed, EBSCO, and Google Scholar, using selected keywords: miscarriage occurrence, maternal age, parity, pregnancy spacing, and maternal health history. This literature review utilizes publications from 2015 to 2020 that can be accessed in full text in PDF format and scholarly (peer-reviewed journals). The criteria for the journals reviewed are research articles published in Indonesian and English.

Results

a. Compare (Similarities)

The seventh journal discusses the factors that can influence the risk of miscarriage, such as maternal age, parity, spacing between pregnancies, and maternal health history.

b. Contrast (Differences)

The differences found in these journals lie in the year of study, study design, population and sample, research location, sampling techniques, and research outcomes.

1). Zheng D, Chunyan L, Taiwen W, and Tang K (2017) titled "Factors associated with spontaneous abortion: a cross-sectional study of Chinese populations" employs a cohort study design involving a large-scale population of 0.5 million people from 10 geographically diverse areas in China, recruited from 2004 to 2008. This research collected data from 84,531 women aged 35–45 in the China Kadoorie Bio-Bank baseline survey. The results indicated that the risk of miscarriage is more prevalent in rural areas compared to urban ones, among women with higher income compared to lower-income women, and among women with higher education levels compared to those with lower education levels.

2). The article by Prihandini S.R, Pujiastuti W, and Hastuti T.P (2016) titled "Unhealthy reproductive age and closely spaced pregnancies increase the incidence of miscarriage at the Military Hospital Doctor Soedjono Magelang." The population studied consisted of pregnant women with a gestational age of <22 weeks receiving medical care. The sampling technique used was saturated sampling, with a total of 135 respondents. The results indicated that the incidence of miscarriage was relatively higher in the at-risk age group and among those with at-risk pregnancy spacing.

c. Criticize (Perspective)

Based on the review of 7 articles, information is provided regarding the factors that can influence the risk of miscarriage, such as maternal age, parity, pregnancy spacing, and maternal health history. Prevention efforts can be made, one of which is to avoid pregnancy at a young age (<20 years) because, biologically, the development of reproductive organs is not yet fully optimal. Additionally, at an older age (>35 years), the elasticity of the pelvic and surrounding muscles, as well as the reproductive organs in general, experiences deterioration. Women in this age group are at

greater risk of experiencing antenatal complications, including miscarriage.

d. Synthesize (Comparison)

Article by Zheng D, Chunyan L, Taiwen W, Tang K (2017) discusses factors related to spontaneous abortion: a cross-sectional study in the Chinese population. The research design used is a large-scale population cohort study involving 0.5 million people from 10 geographically diverse regions in China, recruited from 2004 to 2008. This study collected data from 84,531 women aged 35–45 years. The results indicate that the risk of miscarriage is more vulnerable in rural areas, among low-income women, and women with low educational attainment. Article by Prihandini S.R, Pujiastuti W, Hastuti T.P

(2016) titled "Unhealthy reproductive age and closely spaced pregnancies increase the incidence of miscarriage at the Doctor Soedjono Military Hospital in Magelang." The study population consisted of pregnant women with a gestational age of <22 weeks who received medical care. The sampling technique used was saturated sampling with a total of 135 respondents. The results showed that the incidence of miscarriage was relatively high in at-risk age groups and among those with risky pregnancy spacing.

e. Summarize (Summary)

The seven reviewed articles share a common goal of identifying factors influencing the risk of miscarriage, such as maternal age, parity, pregnancy spacing, and health history.

Table 1. Distribution Frequency of Respondent

Characteristics	Category	Frequency	Percentage
Age	13 years	34	52.3 %
	14 years	31	47.7%
Class	VII	34	52.3 %
	VIII	31	47.7%
Attitude of personal hygiene	Positif	28	43.1 %
	Negatives	37	56.9 %
Knowledge	Good	23	35.4 %
	Fair	16	24.6 %
	Less	26	40 %

Based on Table 1, the majority of the adolescents are 13 years old, with the highest number of respondents coming from grade VII, 52.3%. Most respondents' attitudes related to

personal hygiene were negative (56.9%), and most respondents fall into the category of poor knowledge, accounting for 40%.

Table 2. Knowledge of Adolescents About Personal Hygiene

No	Statements related to the knowledge of personal hygiene	Correct		Wrong	
		n	%	n	%
1	Personal hygiene refers to the cleanliness of the body from head to toe.	51	78.5	14	21.5
2	Personal hygiene of female genitalia is the act of caring	48	73.8	17	26.2
3	Preventing the emergence of viruses that cause vaginal discharge is the aim of implementing personal genital hygiene.	51	78.5	14	21.5
4	For personal hygiene, taking a shower once a day is recommended.	48	73.8	17	26.2
5	Brushing your teeth correctly and adequately is once a day.	46	70.8	19	29.2
6	Cleaning the genital area daily during a bath twice a day	44	67.7	21	32.3

7	The benefits of personal genital hygiene are to prevent the occurrence of discharge, itching, and unpleasant odors.	53	81.5	12	18.5
8	Use a special vaginal fluid at least 5 times a day to maintain genital hygiene.	46	70.8	19	29.2
9	Wash vagina with special fluid at least 5 times a day to maintain genital hygiene.	53	81.5	12	18.5
10	Skin diseases can be caused by a lack of personal hygiene.	49	75.4	16	24.6
11	Clothes that have already been worn, if not washed immediately, should be hung out to dry under the sunlight.	51	78.5	14	21.5
12	Cleaning the ears properly and correctly involves using ear cleaners (cotton buds).	47	72.3	18	27.7
13	Washing your feet properly before sleeping involves using cloudy water.	42	64.6	23	35.4
14	Washing your hair properly before bed involves using cloudy water.	49	75.4	16	24.6
15	A good way to wash your hands is to use soap and running water.	45	69.2	20	30.8
16	Washing clothes to maintain cleanliness	46	70.8	19	29.2
17	One way to maintain cleanliness is not to dry towels in the scorching sun.	39	60	26	40
18	Washing the blanket once a week is not one of the ways to maintain cleanliness.	42	64.6	23	35.4
19	One way to maintain cleanliness is to soak clothes mixed with those of others.	44	67.7	21	32.3
20	To maintain cleanliness, it is not allowed to use clothes alternately with friends.	36	55.4	29	44.6

Based on the table above, it shows that adolescent knowledge about personal hygiene 81.5% of adolescents know that the benefits of personal hygiene in the genital area are to prevent vaginal discharge, itching and unpleasant odors and to wash the vagina > 5 times a day using a special vaginal wash fluid. The majority of respondents did not know that to maintain the genital area, they should not use clothes alternately with friends, which is 44.6%.

Table 1. Results of Review Article

No	Peneliti	Judul	Tahun	Design	Populasi dan Sampel	Teknik Sampling	Hasil
1	Sari M.H[1] Apriyanti F[2] Isnaeni L.M.A[3]	Hubungan usia dan paritas dengan kejadi-an abortus inkomplit di RSUD Tengku Ra-fi''an Siak	2020	*Analictical Observation*	The population consists of pregnant women and women with incomplete, complete, imminent, and incipient abortions. The sample includes 178 women.	*Purposive* sample	The results of the conducted research indicate that there is a relationship between age, parity, previous abortion history, and anemia with the occurrence of incomplete abortion.
2	Fitri N. L[1]	*Correlations Between Age and Distance of Pregnancy with Abor- tus Insident.*	2017	Analytical Survey	The population of this study consists of pregnant women treated at RSUD Jendral Ahmad Yani Metro in 2014, total 518 individuals. A sample of 260 individuals was taken, consisting of 130 individuals in the case group and	*Purposive* sample	The results of the statistical tests indicate a relationship between age and the incidence of abortion (p<0.05).

						130 individuals in the control group..	
3	Silitonga J.M[1] SitorusR. J[2] Yeni[3]	*Causal factors of abortus spontaneous occurance in dr. mo- hammad hoesin general state hospital Palembang.*	2017	Secondary Descriptive	The population in this study consists of all hospitalized pregnant women. The sample in this study includes patients diagnosed with spontaneous abortion and those who delivered spontaneously, 192 mothers.	*Purposive* sample	The factors causing spontaneous abortion based on bivariate analysis are maternal age, parity, and pregnancy spacing. The multivariate results indicate that there is an effect of parity on the occurrence of spontaneous abortion after controlling for the variables of age, abortion history, and body mass index..
4	Widhihastuti[1] Putri I.M[2]	*Determinan yang ber- hubungan dengan ke- jadiaan abortus.*	2020	Deskriptif kuantitatif	The population in this study consists of 302 mothers who experienced miscarriage and 400 mothers who did not experience miscarriage. Based on the sample size calculation with a 5% error margin, a sample of 173 mothers who experienced miscarriage was taken through simple random sampling as the case group, and 173 mothers who did not experience miscarriage as the control group.	*Simple random sampling.*	The research findings show that the characteristics of the respondents are mostly aged 20-35 years, with a total of 259 individuals (72%). There are 207 individuals (59.8%) who are unemployed, parity 3 total 215 individuals (72.8%), and the distance between pregnancies that are risky 5 years accounted for 247 individuals (71.4%). Furthermore, there are 311 individuals (89.9%) who do not have a history of abortion. The results of the chi-square test analysis indicated a relationship between age and the incidence of abortion ($p<0.05$). There is a relationship between work and abortion ($p<0.05$). There is a relationship between parity and abortion ($p<0.05$). There is a relationship between pregnancy spacing and abortion ($p<0.05$). There is a relationship between abortion history and abortion ($p<0.05$). Conclusiondeterminants of abortion include age, work, parity, pregnancy spacing, and abortion history
5	Prihandini S. R[1] Pujiastuti W[2] Hastuti T.P[3]	Usia reproduksi tidak sehat dan jarak keha- milan yang terlalu de- kat meningkatkan ke- jadian abortus di RS Tentara Dokter Soed- jono Magelang.	2016	*Cross Sectional*	The population in thistudy consists of pregnant women with a gestational age of <22 weeks who are receiving medical treatment. The sampling technique used is saturated sampling, with 135 respondents.	Saturation Sampling Technique	The results of this study are that most respondents are in the risky age group, namely 82 people (60.7%); most respondents are in the risky pregnancy interval group, namely 70 people (51.9%); most respondents experienced abortions, namely 107 respondents (79.3%). There is a significant relationship between the age of pregnant women and the

							incidence of abortion at RST dr. Soedjono Magelang in 2013 with significance (p <0.05).
6	Rosadi E[1] Fithiyani[1] Hidayat M[2]	Faktor yang berhubu- ngan dengan kejadia-an abortus di RSUD Raden Mataher Pro-vinsi Jambi.	2019	Kuantitatif	The population in this study consists of pregnant mothers in the maternity ward, totaling 878 participants.	*Simple random sampling*	The results of the study on the relationship between a history of hypertension in pregnancy and the occurrence of abortion showed that (p>0.05), which means there is no relationship between a history of hypertension in pregnancy and the occurrence of abortion. There is a relationship between anemia in pregnancy and the age of the pregnant mother and the occurrence of abortion. (p>0.05).
7	Zheng D[1] Chunyan L[2] Taiwen W[3] Tang K[3]	*Factors associated with spontaneous abortion: a cross-sectional study of Chinese populations*	2017	*Cohort Study*	A large-scale population-based cohort study of 0.5 million people from 10 geographically diverse regions in China, recruited from 2004 to 2008. This research collects data from 84,531 women aged 35-45 years old.	Total Sample	The risk of spontaneous abortion in rural areas is 1.68 times greater than in urban areas. High-income women have a decreased risk of spontaneous abortion compared to low-income women. Women with low educational attainment have a higher risk of spontaneous abortion compared to women with high educational attainment.

Discussion

The results of 7 (seven) journals that have been reviewed show that the age of the pregnant mother, parity, pregnancy interval, and the mother's health history are related to the incidence of abortion.

1. Age of Mother,s

Pregnant women under 20 years old can be detrimental to the health of the mother and the growth and development of the fetus because the reproductive organs are not yet mature for pregnancy. Complications in teenage pregnancy (<20 years old) are higher compared to the healthy reproductive period between 20-30 years. This condition will be even more difficult if coupled with psychological, social, and economic stress, making it easier for miscarriage to occur. This is clarified by the results of a study by Sari M.H, et al., who found that from the medical record data of the risky age of pregnant women ≤ 20 weeks was 38 people, the medical record data of the non-risk age was 102 people, the medical record data of the parity of the risky pregnant women ≤ 20 weeks was 60 people, the medical record data of the non-risk age was 80 people, the medical record data of pregnant women with incomplete abortion was 70 people and the medical record data of normal pregnancy was 70 people. There is a relationship between age and the incidence of incomplete abortion with a significant value (p <0.05). There is no relationship between parity and the incidence of incomplete abortion with a significant value (p <0.05). It is recommended that health workers can further improve the quality of services and supervise in detecting incomplete abortion (8). This is in line with research conducted by Fitri N.L at the General Ahmad Yani Metro Hospital in 2015 that there is a relationship between age and the incidence of abortion (p <0.05). The morbidity and mortality rates in almost all conditions show a relationship with age. Pregnancy at age <20 years is risky, because physically the condition of the uterus and pelvis has not developed optimally. Risks also occur at a gestational age of >35 years. At age >35 years the mother's health condition begins to decline, uterine function decreases, and egg quality decreases. Possible risks in pregnancy at this age are miscarriage, preeclampsia, labor disorders,

bleeding, LBW (Low Birth Weight) and congenital defects (9).

2. Parity

Children more than 4 can cause fetal growth disorders and bleeding during labor because the uterus is usually weak. Parity 2-3 is usually the safest parity in terms of maternal mortality. Parity 1 and high parity (more than 3) have higher maternal mortality rates. The higher the parity, the higher the maternal mortality rate. The risk in parity 1 can be handled with better obstetric care, while the risk in high parity can be reduced or prevented with family planning. Some pregnancies in high parity are unplanned. Research conducted by Silitonga J.M, Sitorus R.J and Yeni (2017) that the results of the study showed a significant relationship between parity and the incidence of abortion. The majority of mothers who experienced abortion were mothers with high parity cases (57%) (10). The results of this study are also in line with the results of a study conducted by Widhihastuti A.D, Putri I.M that there is a relationship between parity and the incidence of abortion. The results of this study state that pregnant women with parity >3 times, are more likely to experience abortion, compared to mothers with parity 2-3 times. There is a relationship between work and the incidence of abortion cases (p<0.05). There is a relationship between parity and the incidence of abortion (p<0.05). There is a relationship between pregnancy spacing and the incidence of abortion (p<0.05). There is a relationship between abortion history and the incidence of abortion (p<0.05). The conclusion of the determinants of abortion incidence includes age, work, parity, pregnancy spacing, and abortion history (11)

3. Pregnancy distance

A suitable interval between a previous pregnancy and the next is between 2 to 4 years. A gap that is too long can increase the risk of miscarriage, while a gap that is too short can also raise the incidence of miscarriage. Research conducted by Prihandini S. R, Pujiastuti W, and Hastuti T.P found that the majority of respondents were in the high-risk pregnancy interval category. This means that there were 70 respondents (51.9%) with high-risk pregnancy intervals, whereas approximately 65 respondents (48.1%) had safe pregnancy intervals. Although the ages of 20 to 35 are considered safe for pregnancy and childbirth, it does not mean that women can conceive every year, as the ideal interval between pregnancies is between 2 to 4 years.

The calculation for the ideal pregnancy interval should be no less than 2 years, based on considerations for the reproductive organs returning to their original state, leading to the term postpartum period, which refers to the time when reproductive organs revert to their pre-pregnancy condition. After childbirth, it is recommended to prepare for the next pregnancy at least 24 months later to reduce risks that may harm the mother, perinatal outcomes, and the baby. Pregnancies spaced less than 2 years apart can result in miscarriage, low birth weight, poor nutrition, and a reduced duration of breastfeeding for the previous child.

4. Mother's medical history

Various infectious diseases, chronic diseases, endocrine disorders, nutritional deficiencies, uterine and cervical deformities, and emotional and physical trauma can cause abortion. The results of research conducted by Rosadi E, Fithiyani, and Hidayat M showed that there was a relationship between a history of hypertension in pregnancy and the occurrence of abortion with a significant value (p<0.05). There was a relationship between anemia in pregnancy and the occurrence of abortion (p<0.05).14 One of the causes of abortion in pregnant women is due to maternal disease. Maternal disease directly affects the growth of the fetus in the womb through the placenta, such as hypertension in pregnancy. Hypertension in pregnancy in the mother will cause blood vessels to narrow so that oxygen flow to the fetus is reduced and will cause fetal growth to be disrupted until fetal death occurs (12).

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