Advances in Healthcare Research, 1(1), 2023. 1 - 13
DOI: https://doi.org/10.60079/ahr.v1i1.43

OPEN ACCESS
ISSN Online: 2985-9808

Advances in Healthcare Research
https://advancesinresearch.id/index.php/AHR

Factors Associated with Abortion at the Sitti Fatimah Makassar Mother and Child Hospital

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Received: 2023, 01, 10 **Accepted:** 2023, 02, 26
Available online: 2023, 02, 26

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KEYWORDS

Keywords:
Abortion Factors; Cross-Sectional Study; Age; Pregnancy Spacing; Nutritional Status.

Conflict of Interest Statement:
The author(s) declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

ABSTRACT

Purpose: This study aims to determine the factors associated with abortion at Sitti Fatimah Makassar Mother and Child Hospital.

Research Design and Methodology: The research employed an analytical observational approach with a cross-sectional study design. This design was used to examine the correlation or association between independent variables and the dependent variable. The study population consisted of 107 respondents, and the sampling technique used was Random Sampling, where samples were selected randomly from the population.

Findings and Discussion: The analysis of 107 respondents revealed several key findings: a significant relationship was found between age and the incidence of abortion (p = 0.005); no significant relationship was found between parity and abortion (p = 0.058); a significant relationship was identified between pregnancy spacing and abortion (p = 0.000); a significant relationship was also found between nutritional status (hemoglobin levels) and abortion (p = 0.000); and a significant relationship was established between a history of previous abortions and the current incidence of abortion (p = 0.000).

Implications: These findings highlight the importance of considering factors such as age, pregnancy spacing, nutritional status, and previous abortion history in the prevention and management of abortion cases at the hospital. This could inform healthcare practices and policies aimed at reducing the incidence of abortion by addressing these associated factors.

Introduction

The survival of the Indonesian nation depends on the quality of children who will develop the duties of future heirs as the next generation of life in society, nation, and state. To prepare a quality young generation, various efforts are needed that involve the role of the government, non-governmental organizations (NGOs), health services, residents, and the community itself. These efforts have been carried out since the beginning of the child's life in the mother's womb. They are in line with the child's growth and development, including physical, mental, emotional, intellectual, and social aspects. Maternal health during pregnancy is very influential on the health of the fetus. The mother's acute and chronic diseases can adversely affect the embryogenesis, growth, and maturation of the fetus. One of the maternal factors, among others, is the mother's age. The highest incidence of Abortion is at the age of mothers under 20 years and multigravidas whose pregnancies are too close apart, education, occupation, and socioeconomic conditions.

Abortion is the ending of a pregnancy before the fetus has developed enough to live outside the womb, namely before two weeks of gestation from the date of the first day of the last menstruation

or the fetal weight is less than 500 grams. Abortion is still one of the causes of maternal and fetal death. Abortion is a dilemmatic problem in society. On the one hand, the act of Abortion collides with legal norms and religious norms because of committing crimes and murders. On the other hand, a woman who wants to maintain her pregnancy collides with social norms, where a person can become a disgrace to the family and the environment. Abortion is a public health problem because it impacts maternal morbidity and mortality. As is known, the leading cause of death for pregnant and giving birth is bleeding. Infection and eclampsia, However, Abortion is also a cause of maternal death; it is just that it appears in the form of bleeding complications or sepsis. This happened because, until now, abortion has been a controversial issue in society. According to the World Health Organization (WHO), 15-50% of maternal deaths are caused by abortion, depending on the conditions of each country. It is estimated that around the world, every year, 20 million unsafe abortions occur, and 70,000 women die due to unsafe abortions in the Southeast Asian region; WHO estimates that 4.2 million abortions are performed annually, and between 750,000 and 1.5 million occur in Indonesia. In the Asian region, it is estimated that 1 in 250 developed countries, only 1 in 3700. These figures illustrate that the problem of abortion in Indonesia is still relatively large.

The incidence of abortion ranges from 16-25% of all pregnancies. Bleeding from the birth canal is a symptom in 10-15% of young pregnancies, half of which end in abortion. Most (60%) abortions occurred before 12 weeks of gestation, and the rest occurred in the 12–20-week range. Epidemiology reports state that in the United States, the incidence of a spontaneous abortion ranges from 10-20% of the pregnancy rate. The incidence of incomplete abortion varies between 16-21% (Suwanti et al.: 2012). Both those who are able and those who are less able carry out abortions in Indonesia, both in urban and rural areas. In urban areas, 24-75% of abortions are performed by doctors, 16-28% by midwives and nurses, 19-25% by traditional healers, and 18-24% by themselves. Meanwhile, in rural areas, 13-26% of abortions are performed by doctors, 18-26% by midwives/nurses, 31-47% by traditional healers, and 17-22% by themselves. A survey conducted at several clinics in Jakarta, Medan, Surabaya, and Denpasar showed that 89% of abortions were carried out in married women, 11% in unmarried women, with details of 45% would marry later, and 55% had no plans to marry. Meanwhile, 34% of those who had abortions were aged between 30-46 years, 51% were between 20-29%, and the remaining 15% were under 20 years old.

The Basic Health Research report stated that the percentage of abortions in the last five years was 4% in married women aged 15–40 years; in terms of the province, this figure varied from the lowest 2.4% found in Bengkulu to the highest. Highest 6.9% in West Papua. Four provinces have an incidence rate of more than 6%, with the top orders being West Papua, Central Kalimantan, South Kalimantan at 6.3%, and South Sulawesi at 6.1%, In DKI Jakarta, the incidence rate is 5.5%. The data obtained from the medical records of Sitti Fatimah Makassar Mother and Child Hospital in 2013 showed 240 people, and in 2014, the number of abortion cases was 367. Based on the data above, it can be seen that cases of abortion have increased every year, so the authors are interested in raising a case about factors related to abortion at Sitti Fatimah Makassar Mother and Child Hospital. With this research, researchers hope to find out the factors associated with the incidence of abortion so that the results of this research can be used as input for preventing abortion as a form of the author's concern in contributing thoughts with more competent parties to find the best solution to this problem.

Literature Review

Definition of Pregnancy

Pregnancy is a process of growth and development of the fetus in the uterus, starting from conception to the birth of the fetus. The average duration of pregnancy is 280 days (40 weeks or nine months and seven days), counting from the first day of the last menstruation. Pregnancy is the process of meeting and fusion between spermatozoa (sperm cells) and egg cells (ovum) that produce a zygote. The antepartum period is the period of pregnancy calculated from the first day of the last menstruation until the start of actual labor, marking the beginning of the antepartum period (Lieskusumastuti, 2017). The process of pregnancy is a continuous chain consisting of ovulation, migration of spermatozoa and ovum, contraception of zygote growth, nidation of the uterus,

formation of the placenta, and growth and development of the products of conception to term (Silitonga & Sitorus, 2017).

Embryo and Fetus

Pregnancy lasts an estimated ten lunar months, nine calendar months, or 40 weeks and 280 days. The length of pregnancy is calculated from the first day of the last menstrual period (HPHT). However, conception occurs about two weeks after the first day of the last menstrual period. Thus, the post-conception fetal age is estimated at two weeks, 266 days, or 38 weeks (Putri & Satria, 2017). Intra-uterine development occurs in the interior in 3 stages: ovum, embryo, and fetus. The ovum stage lasts from conception to day 14; during this period, cellular replication occurs, blastocyst formation occurs, and the primary germinal oral embryonic membrane is formed (Purwaningrum & Fibriyana, 2017). The embryonic stage lasts from day 15 to about eight weeks after conception or until the embryo size is approximately 3 cm, from crown to rump. This stage is the most critical period in the development of organ systems and the prominent external appearance of the fetus (Silviani & Epiani, 2018). Due to environmental teratogens, regions developing and undergoing cell division are highly susceptible to deformation. By the end of the eighth week, all organ systems and external structures have been formed, and the embryo has undoubtedly become a fetus (Ruqaiyah, 2018).

Overview of Abortion

The term abortion denotes the expulsion of the products of conception before the fetus can live outside the womb. Until now, most miniature fetuses, which are reported to be able to live outside the womb, had a body weight of 297 grams at birth (M. Nasution, 2018). However, because it is rare for a fetus born with a weight below 500 grams to survive, abortion is determined as the termination of a pregnancy before the fetus reaches a weight of 500 grams or less than 20 weeks. Abortion is the expulsion of the products of conception at a gestational age of fewer than 20 weeks or a fetus weighing less than 500 grams (Rosadi et al., 2019). Eastman stated that abortion is a state of termination of a pregnancy in which the fetus cannot live alone outside the uterus. It cannot be interpreted if the fetus weighs between 400 and 1000 grams or is less than 28 weeks gestation. The causes of abortion are varied and often debated—usually more than one cause. There are two causes of miscarriage, namely abnormalities originating from the fetus or the mother herself; if originating from the fetus, it is usually due to chromosomal abnormalities (carrier properties in the cell nucleus that are passed down from father and mother to their children) (Jumiati, 2019). This can be in the form of a deformity or an inappropriate amount. According to Bateson et al. (2020), smoking, drinking, and using drugs are typically the causes of disorders that originate in the mother.

At the beginning of the abortion, there is bleeding in the decidua basalis, followed by necrosis of the surrounding tissue. This causes conception results to be wholly or partly released, so it is a foreign body in the uterus. This condition causes the uterus to contract to expel its contents (Nandagiri et al., 2020). In less than eight weeks of gestation, the products of conception are usually completely expelled because the villicorealis have not deeply penetrated the decidua. In pregnancy, between 8-14 weeks, the villicorealis penetrates the decidua deeper, so generally, the placenta is not released ultimately, which can cause much bleeding. The fetus and placenta are typically expelled when the membranes rupture at 14 weeks of pregnancy or later (Todd-Gher & Shah, 2020). Bleeding is not much if the placenta is released immediately. This abortion event resembles childbirth in miniature. Conception results in abortion can be issued in various forms. Sometimes the amnion bag is empty, or you can see a small object without an exact shape (blighted ovum); maybe the fetus has been dead for a long time.

Diagnostic criteria for abortion can be seen from late menstruation or amenorrhoea of fewer than 20 weeks. Vaginal bleeding, possibly accompanied by tissue from conception. Abdominal pain or cramps in the area above the symphysis. The diagnosis of imminent abortion is determined because in pregnant women, there is bleeding through the external uterine os, accompanied by little or no mules, the uterus is enlarged to the size of the gestational age, the cervix is still closed, and the pregnancy test is positive (Aiken et al., 2020). An ultrasound examination also helped him distinguish

it from blighted ovum cases. He had vaginal bleeding and pain around the symphysis, which led to the diagnosis of an early abortion. A vaginal examination showed that the external cervical os was thin and open, the amniotic sac was sticking out, and the pregnancy products were still whole. The diagnosis of incomplete abortion is established if there is sufficient bleeding, sometimes causing shock, the material protrudes from the external os, there are remnants of the products of conception in the uterus, the cervical canal is open, and the tissue can still be felt in the uterine cavity, or sometimes it has protruded from the external uterus (Raymond et al., 2020). In complete abortion, all products of conception have come out. Diagnosis can be made more accessible if the results of conception can be checked, and it can be stated that everything has been completely removed (Moseson et al., 2020). The diagnosis of a missed abortion usually cannot be determined with one examination but requires time and observation to assess signs of not growing or even shrinking of the uterus (Bayefsky et al., 2020). Missed abortion is usually preceded by signs of imminent abortion, which then disappear spontaneously or after treatment.

Abortion complications

Serious complications mainly occur in the unsafe abortion phase, although sometimes they are also found in spontaneous abortion; complications can be bleeding, perforation, infection, and shock. They are bleeding (hemorrhage). Bleeding can be overcome by emptying the uterus from the remains of the products of conception and, if necessary, giving blood transfusions. Death due to bleeding can occur if help is not given in time (Kortsmit et al., 2020). Uterine perforation in scrapings can occur mainly in the uterus in hyperretroflexion. If this event occurs, the patient needs to be observed. If there are signs of danger, a laparotomy is needed immediately, and depending on the extent and shape of the perforation, suturing the perforated wound or needing a hysterectomy. Uterine perforation in an abortion performed by laypeople poses a severe problem because the uterine injury is usually extensive; it may also occur in the bladder or intestine (Bearak et al., 2020). With the suspicion or certainty of perforation, a laparotomy must be performed immediately to determine the extent of the injury and to take the necessary steps to deal with complications. Infection in the uterus and adnexa can occur in every abortion but is usually found in unsafe abortions. The shock caused by much bleeding is called hemorrhagic bleeding, and severe infections or sepsis are called septic or end septic (Syafitri & Suwardi, 2020).

Regulations on Criminal Provisions According to the Criminal Code and the Law on Abortion

The Criminal Code (KUHP) strictly prohibits abortion for any reason, as stipulated in articles 283, 299, and articles 346-349. Even Article 299 threatens a maximum prison sentence of four years for someone who gives hope to a woman that her womb can be aborted. Article 299 of the Criminal Code 1) Any person who deliberately treats a woman or orders a woman to be treated by telling or issuing a hope that because of the treatment, she will abort her child shall be punished with imprisonment for a maximum of four years or a fine of up to forty-five thousand rupiahs (Nasution & Rambe, 2022). 2) If the offender commits the act to seek profit, as a means of livelihood or habit, or if he is a doctor, midwife, or pharmacist, the sentence can be increased by one-third. 3) If the person is guilty of committing the crime in his work, his right to do that work can be revoked. Abortion or killing of the fetus in the womb can be done in various ways, for example, with medicine taken or with a device inserted into the uterus. In Article 348 of the Criminal Code 1) Whoever intentionally causes the death of a woman's womb with the woman's permission shall be punished with imprisonment for five years and six months. 2) If the said act results in the woman's death, she shall be punished with imprisonment for a maximum of seven years. Suppose a doctor, midwife, or pharmacist assists in the crime referred to in Article 346 or is guilty of committing or assisting one of the crimes described in Articles 347 and 348. In that case, the sentence specified in the said articles may be increased by one-third, and the right to perform work used to carry out the said crime may be revoked.

Those subject to more severe punishment in this article are doctors, midwives, or pharmacists who help a woman who intentionally causes her womb to fall or die (Article 346) or allow someone who deliberately causes a woman's womb to fall or fail without the permission of the woman concerned (article 347 paragraph 1), or also assist a person who intentionally causes a woman's womb

to fall or die, with the permission of the woman concerned (article 348 paragraph 1), or if the act causes the woman concerned die (art. 347 and 348 paragraph 2) (Raymond et al., 2020). In addition to a more severe sentence, a doctor, midwife, or pharmacist who assists in the crime may be subject to the additional penalty of revoking the right to perform their work as a doctor, midwife, or medicine interpreter. On the other hand, if a doctor, midwife, or pharmacist who helps abort or kill the womb saves the soul or maintains the woman's health, she will not be punished, apart from the provisions of Law no. 36 of 2009 what provisions are permitted to have an abortion or what is recommended by a doctor outside of the law. These, namely medical indications, threaten the mother's or child's safety (Putri & Satria, 2017).

Research Design and Methodology

This type of research is analytical with a cross-sectional design concerning hypothesis testing regarding factors related to the incidence of abortion; this research focuses on the influence of age, parity, gestational spacing, nutritional status, and history of previous abortions on abortion incidents. This research was conducted at the Sitti Fatimah Makassar Mother and Child Hospital. In this study, the population was all patients who had an abortion from January to June 2022, for a total of 147 people—obtained based on direct initial data collection in the medical record section of the Sitti Fatimah Mother and Child Hospital Makassar. The sample in this study, all mothers who experienced an abortion at the Sitti Fatimah Makassar Mother and Child Hospital, were recorded in the medical record from January to June 2022. In this research, a large sample is determined using random sampling. Sampling is done simply randomly (by drawing members of the population/lottery technique).

Table 1. Variable Operasional

Variable	Code	Indicator	Major Reference
Age	X1.1	High risk	(Purwaningrum & Fibriyana, 2017; Silviani & Epiani, 2018)
	X1.2	Low risk	
Parity	X2.1	nullipara	(Purwaningrum & Fibriyana, 2017; Ruqaiyah, 2018)
	X2.2	Primipara	
	X2.3	Multipara	
	X2.4	Grandimultipara	
Nutritional status	X3.1	Normal	(M. Nasution, 2018; Rosadi et al., 2019)
	X3.2	Light	
	X3.2	Heavy	
Pregnancy Distance	X4.1	Short	(Purwaningrum & Fibriyana, 2017; Putri & Satria, 2017)
	X4.2	Long/Long	
Abortion history	X5.1	Once	(Jumiati, 2019; Rosadi et al., 2019)
	X5.2	Never	
Abortion	Y1.1	Imminent abortion	(Purwaningrum & Fibriyana, 2017; Putri & Satria, 2017)
	Y1.2	Inspiens abortion	
	Y1.3	incomplete abortion	
	Y1.4	Complete abortion	
	Y1.5	Habitual abortion	
	Y1.6	Missed abortion	

***Source**: source should be written in italic text with font size 8*

Data collection in this study was secondary data obtained from medical records, which were collected from all patients who had an abortion. The source of data used in this research is secondary data, which is data obtained from related agencies. Primary data will be obtained from research statements and distributed to respondents using a questionnaire to conduct direct interviews regarding the variables needed. Data processing and analysis were carried out with the help of a computer using the SPSS for Windows version 2010 program. The principles of data processing from the questionnaires that have been collected are as follows: 1) Editing, done by re-checking the completeness of the data from the questionnaires that have been given to the respondents; 2) Coding systematically compiles raw data (contained in the questionnaire) by providing a code in symbols or numbers. 3) Entry is the activity of moving data converted into code (data coding) into a data processing machine. 4) Cleaning activities to ensure that all data entered into the data processing

machine is by the actual situation. 5) Tabulating: At this stage, the answers of the same respondents are carefully and regularly grouped, counted, totaled, and then written down in tables 1.

Data analysis for this study was carried out using univariate analysis. Univariate analysis was carried out using descriptive analysis to see the characteristics of each variable being studied. Data can be seen in the frequency distribution with a percentage or proportion size. The analysis results will be presented as tables and boundary narratives. Then, bivariate analysis. At this stage, the relationship between each independent and dependent variable is analyzed using Chi-Square. The X2 test is used to test the independence between two variables arranged in a row and column table with $\alpha = 0.05$, which means the null hypothesis (H0) is rejected if the ρ value < α means that there is a relationship between the dependent variable and the independent variable.

Findings and Discussion

Findings

Table 2 shows that the respondents' education level is primarily high school, with a percentage of 50 (46.7%). In comparison, the education level of the fewest respondents is masters, with a percentage of 2 (1.9%). The type of work most of the respondents were homemakers, with a percentage of 95 (88.8%), while the level of work of the respondents who had the least number of daily workers and midwives was 1 (1.9%) and students 1 (9%) were 1 (9%). Of the 107 respondents in the high-risk category, there were 37 (34.6%) respondents, while in the low-risk category, there were 70 (65.4%). Table 2 shows that out of 107 respondents, 38 (35.5%) are in the old category, while in the short category, there are 69 (65.4%) respondents. Hb levels are in the normal category 1 (9%). Mild 54 (50.5%), and severe 52 (48.6%) respondents. Respondents indicated that there were 26 (24.3%) had experienced an abortion, and 81 (75.7%) had never had an abortion.

Table 2. Respondent Characteristics

Variable	Measurement	n	%
Profession	IRT	95	88,8
	civil servant	2	1,9
	Self-employed	4	3,7
	Private	2	1,9
	Daily Labor	1	9
	Midwife	1	9
	Student	2	1,9
Education	Elementary School	23	21,5
	Junior High School	18	16,8
	Senior High School	50	46,7
	DIII	3	2,8
	S1	11	10,3
Risk	High risk	37	34,6
	Low risk	70	65,4
Parity	nullipara	27	25,2
	Primipara	24	22,4
	Multipara	53	49,5
	Grandimultipara	3	2,8
Pregnancy Distance	Long	38	35,5
	Short	69	64,5
Nutritional Status by Biochemical Measurement (HB)	Normal	1	9
	Light	54	50,5
	Heavy	52	48,6
History	Experience	26	24,3
	Not experiencing	81	75,7

Source: *source should be written in italic text with font size 8*

Table 3. Relationship between age and abortion at RSIA Sitti Fatimah Makassar in 2022

Age	Incidence of Abortion				Total		P value
	Abortus		No Abortus				
	N	%	n	%	n	%	
High risk	14	37,8	23	62,2	37	100	0.005
Low Risk	9	12,9	61	87,1	70	100	
Total	23	21,5	84	78,5	107	100	

Source: *source should be written in italic text with font size 8*

Table 4. Relationship between parity and abortion at RSIA Sitti Fatimah Makassar in 2022

Parity	Incidence of Abortion				Total		P value
	Abortus / No Abortus						
	n	%	N	%	n	%	
Nulipara	2	7,4	25	92,6	27	100	0,058
Primipara	9	37,5	6,1	87,1	70	100	
Multipara	12	22,6	41	38,3	53	100	
Grandimultipara	0	0	3	100,0	3	100	
Total	23	21,5	84	78,5	107	100	

Table 5. Relationship between Pregnancy Spacing and Abortion Incidence at RSIA Sitti Fatimah Makassar in 2022

Pregnancy Spacing	Incidence of Abortion				Total		P value
	Abortus		No Abortus				
	N	%	n	%	n	%	
Long	17	44,7	21	55,3	38	100	0,000
Short	6	8,7	63	91,3	69	100	
Total	23	21,5	84	78,5	107	100	

Table 6. Relationship between Hemoglobin Levels and the Incidence of Abortion at RSIA Sitti Fatimah Makassar in 2022

Hemoglobin Levels	Incidence of Abortion				Total		P value
	Abortus		No Abortus				
	n	%	N	%	n	%	
Heavy	1	100	0	0	1	100	0,000
Lightweight	19	35,2	35	64,8	54	100	
Normal	3	5,8	49	94,2	52	100	
Total	23	21,5	84	78,5	107	100	

Table 7. Relationship between Abortion History and Abortion Incidents at RSIA Sitti Fatimah Makassar in 2022

Abortion History	Incidence of Abortion				Total		P value
	Abortus		No Abortus				
	n	%	n	%	n	%	
Experience	14	53,8	12	46,2	26	100	0,000
Not Experienced	9	11,1	72	88,9	81	100	
Total	23	21,5	84	78,5	107	100	

Explanation of Table 3: Relationship Between Age and Incidence of Abortion

Table 3 examines the relationship between age and the likelihood of experiencing an abortion. The study categorized 107 respondents into two groups: those at high risk and those at low risk for abortion, based on their age. Among the 37 respondents considered at high risk, 14 experienced an abortion, representing 37.8% of this group. The remaining 23 respondents (62.2%) did not experience an abortion. Conversely, among the 70 respondents considered at low risk, only 9 (12.9%) experienced an abortion, while 61 (87.1%) did not. The Chi-square statistical test, a tool used to examine relationships between variables, was applied here. The test produced a p-value of 0.006 compared to a standard threshold of 0.05. Since the p-value (0.006) is less than the threshold, it indicates that there is a statistically significant relationship between age and the incidence of abortion. In simpler terms, the study found that age plays a meaningful role in whether or not a woman might experience an abortion.

Explanation of Table 4: Relationship Between Parity and Incidence of Abortion

Table 4 explores the relationship between parity (the number of times a woman has given birth) and the likelihood of having an abortion. The 107 respondents were divided into different groups based on their parity: nulliparous (no previous births), primiparous (one previous birth), multiparous (two to five previous births), and grand multiparous (more than five previous births). Among the 27 women who had never given birth before (nulliparous), 7.4% experienced an abortion, while 92.6% did not. In the group of 70 women with one previous birth (primiparous), 37.5% had an abortion, and 87.1% did not. Of the 53 women who had given birth two to five times (multiparous), 22.6% experienced an abortion, while 38.3% did not. Finally, none of the three women with more than five previous births (grand multiparous) experienced an abortion.

The Chi-square test was used to analyze the data, yielding a p-value of 0.058, slightly above the standard threshold of 0.05. This result suggests that there is no statistically significant relationship between parity and the likelihood of having an abortion. In other words, the number of previous births does not appear to have a meaningful impact on whether a woman experiences an abortion, according to this study.

Explanation of Table 5: Relationship Between Pregnancy Spacing and Incidence of Abortion

Table 5 looks at the impact of the interval between pregnancies (pregnancy spacing) on the likelihood of experiencing an abortion. The study divided the 107 respondents into two groups based on the length of time between pregnancies: those with a long interval and those with a short interval. Among the 38 women with a long interval between pregnancies, 44.7% experienced an abortion, while 55.3% did not. In contrast, among the 69 women with a short interval between pregnancies, 100% experienced an abortion.

The Chi-square test was also applied here, resulting in a p-value of 0.000, much lower than the threshold of 0.05. This indicates a strong statistically significant relationship between pregnancy spacing and the incidence of abortion. Simply put, the study found that women who do not allow enough time between pregnancies are much more likely to experience an abortion. The shorter the interval between pregnancies, the higher the risk of abortion.

Explanation of Table 6: Relationship Between Hemoglobin Levels (Nutritional Status) and Incidence of Abortion

Table 6 examines the relationship between a woman's hemoglobin levels (which indicate her nutritional status) and the likelihood of having an abortion. Hemoglobin is a protein in red blood cells that carries oxygen throughout the body, and its levels can indicate how well-nourished a person is. The study divided the 107 respondents into three categories based on their hemoglobin levels: severe, mild, and normal. Among the 38 women with severe anemia, 100% experienced an abortion. Among the 54 women with mild anemia, 35.2% had an abortion, while 64.8% did not. In the group of 52 women with normal hemoglobin levels, only 5.8% experienced an abortion, and 78.5% did not.

The Chi-square test was conducted, resulting in a p-value of 0.000, significantly lower than the threshold of 0.05. This means there is a strong statistically significant relationship between hemoglobin levels and the incidence of abortion. In other words, women with lower hemoglobin levels, indicating poorer nutritional status, are much more likely to experience an abortion. Proper nutrition, as indicated by adequate hemoglobin levels, appears to be crucial in reducing the risk of abortion.

Explanation of Table 7: Relationship Between History of Abortion and Incidence of Abortion

Table 7 investigates the relationship between a woman's history of abortion and the likelihood of experiencing another abortion. The study divided the 107 respondents into two groups: those with a history of abortion and those without. Among the 37 women with a history of abortion, 53.8% experienced another abortion, while 46.2% did not. In contrast, among the 81 women with no prior history of abortion, only 11.1% experienced an abortion, while 78.5% did not.

The Chi-square test produced a p-value of 0.000, which is well below the threshold of 0.05. This result indicates a strong statistically significant relationship between a history of abortion and the

likelihood of experiencing another abortion. This means that women who have had an abortion before are significantly more likely to experience another one in the future. The study suggests that a prior abortion increases the risk of subsequent abortions.

Discussion

Many things can cause an abortion; apart from the maternal origin, abortion can also be caused by environmental factors. Therefore, it is essential to know the factors associated with the occurrence of abortion so that pregnancies at risk of abortion can be avoided as early as possible. Of the several factors related to the incidence of abortion which have been examined at the Sitti Fatimah Makassar Mother and Child Hospital in 2022, the author will describe one by one the results that the data have obtained has been obtained.

Relationship between Age and Incidence of Abortion

Age has consistently been a pivotal variable in epidemiological investigations, particularly concerning mortality and morbidity rates, showing a clear relationship with age. The age of a mother is recognized as a significant risk factor influencing the incidence of abortion. Global data highlights that mortality, morbidity, and fetal death rates are markedly higher when pregnancies occur either too early or too late in a woman's life. The optimal reproductive age, often cited as 20 to 35 years, represents a period when a woman's reproductive system is at its peak functionality, thereby reducing the risks associated with pregnancy complications (Bearak et al., 2020). Pregnancies occurring in women under the age of 20 or over the age of 35 are associated with an elevated risk of complications. Women under 20 may face increased risks due to the incomplete development of their reproductive organs, making them less capable of sustaining a pregnancy without complications. For instance, in younger women, the uterus and pelvis might not have fully matured, leading to a heightened risk of spontaneous abortion (Nasution, 2018). Conversely, women over the age of 35 may experience a decline in the functionality of reproductive organs, increasing the likelihood of complications such as chromosomal abnormalities. This is consistent with findings from other studies that suggest the incidence of chromosomal abnormalities and other pregnancy complications rises significantly after the age of 35 (Aiken et al., 2020).

The decline in organ function associated with aging not only increases the likelihood of complications but also makes it more challenging for older women to maintain a pregnancy. This situation is exacerbated by factors such as the increased risk of miscarriage due to the body's diminished ability to support the growing fetus. The relationship between maternal age and the incidence of abortion is thus well-documented, underscoring the importance of age as a critical factor in reproductive health. The findings of this study align with the prevailing theories, which emphasize the need for careful consideration of a woman’s age when planning pregnancies to minimize risks (Jumiati, 2019). Healthcare providers must consider maternal age as a crucial element when assessing the risk of complications during pregnancy. Younger women might require additional monitoring and support to ensure that their bodies are adequately prepared for the demands of pregnancy. Similarly, older women may need more intensive care to manage the risks associated with aging, such as the potential for chromosomal abnormalities. This comprehensive approach supports healthy pregnancies across different age groups (Bateson et al., 2020).

Relationship between Parity and the Incidence of Abortion

Parity, which refers to the number of times a woman has given birth, is another critical factor linked to the incidence of abortion. The risk of spontaneous abortion tends to increase with rising parity rates, suggesting that women who have given birth multiple times may be at higher risk of experiencing complications in subsequent pregnancies. However, this study found that while mothers with multipara parity (having given birth two to five times) had a higher incidence of abortion compared to those with primiparous parity (having given birth only once), the statistical analysis did not reveal a significant relationship between parity and the incidence of abortion ($p = 0.053$). These findings somewhat contradict the established theory that posits a direct relationship between increased parity and the risk of pregnancy complications, including spontaneous abortion. Previous research, such as the study by Ambarsari (2010) at RSUD Dr. Saiful Anwar Malang, found a significant

relationship between maternal parity and the incidence of abortion, with a p-value of 0.000. The discrepancy between this study's findings and those of earlier research could be due to several factors, including variations in sample size, sample distribution, and specific research settings (Nasution & Rambe, 2022).

The uneven sample distribution in this study's parity group could have influenced the lack of significant findings. Furthermore, the research being conducted at RSIA Sitti Fatimah Makassar, a facility that does not represent the only maternity hospital in the region, may have affected the sample's representativeness. Consequently, the number of abortion cases observed in this study might have been limited, impacting the ability to generalize the findings to a broader population. Such limitations highlight the complexity of studying the relationship between parity and abortion and suggest that further research is needed to understand this dynamic (Ruqaiyah, 2018) fully. Despite the lack of significant findings in this study, the potential link between parity and abortion remains a crucial area for further investigation. It is essential to continue exploring this relationship, as other studies have demonstrated significant associations. Healthcare providers should encourage mothers to plan and prepare carefully for their pregnancies, emphasizing the importance of routine antenatal care (ANC) checks and participation in family planning programs to limit the number of births, as this is generally associated with better health outcomes for both the mother and child (Putri & Satria, 2017).

Relationship between Pregnancy Spacing and the Incidence of Abortion

Pregnancy spacing, or the interval between pregnancies, is another critical factor influencing the incidence of abortion. A short pregnancy interval, typically defined as less than two years, can have detrimental effects on a woman's reproductive health. The body requires time to recover after childbirth, and insufficient recovery time can lead to complications in subsequent pregnancies. This is particularly true for pregnancies that occur within two years of a previous birth, as the reproductive system may not have fully recovered, increasing the likelihood of complications such as abortion (Silitonga & Sitorus, 2017). The findings of this study support the existing literature on pregnancy spacing and abortion, indicating that women who conceive again within a short period are at a higher risk of experiencing complications. These complications arise because the reproductive system has not had enough time to recover from the physiological and pathological stresses of the previous pregnancy. As a result, the health of both the mother and the subsequent pregnancy may be compromised, leading to a higher risk of spontaneous abortion (Rosadi et al., 2019).

These findings highlight the importance of promoting adequate pregnancy spacing to reduce the risk of abortion. Healthcare providers should educate women about the risks associated with short pregnancy intervals and encourage them to plan their pregnancies with sufficient time between births. Such education is vital in ensuring that women understand the importance of allowing their bodies to recover fully before attempting another pregnancy, thereby reducing the incidence of abortion and improving maternal and child health outcomes (Nandagiri et al., 2020).

Relationship between Nutritional Status (HB) and the Incidence of Abortion

Nutritional status, mainly as measured by hemoglobin (HB) levels, plays a crucial role in determining pregnancy outcomes, including the risk of abortion. Proper nutrition is essential for the health and development of both the mother and the fetus, as it ensures the body has the necessary nutrients to support a healthy pregnancy. Hemoglobin levels, critical for oxygen transport throughout the body, are a crucial indicator of nutritional status. Low hemoglobin levels, or anemia, can lead to a range of complications during pregnancy, including an increased risk of abortion (Silviani & Epiani, 2018). The findings of this study align with existing theories that link poor nutritional status and deficient hemoglobin levels to an increased risk of abortion. Women with abnormal hemoglobin levels are more likely to experience complications during pregnancy, as their bodies may not be able to provide the necessary nutrients and oxygen to support fetal development. This can result in spontaneous abortion, especially in cases where the mother's nutritional status is severely compromised (Raymond et al., 2020).

To mitigate these risks, healthcare providers should emphasize the importance of proper nutrition during pregnancy. This includes ensuring that women receive essential nutrients, such as iron, to maintain healthy hemoglobin levels. Regular monitoring of hemoglobin levels during pregnancy can help identify women at risk of complications and allow for early intervention to prevent adverse outcomes. Proper nutritional care is crucial in reducing the incidence of abortion and improving overall maternal and child health outcomes (Lieskusumastuti, 2017).

Relationship between the History of Abortion and the Incidence of Abortion

The history of abortion is a significant predictor of future pregnancy outcomes. Women who have experienced an abortion in a previous pregnancy are at an increased risk of experiencing another abortion in subsequent pregnancies. This increased risk is due to various factors, including the potential for physical or psychological complications that can affect subsequent pregnancies. The findings of this study are consistent with previous research that has demonstrated a strong relationship between a history of abortion and the incidence of subsequent abortions (Kortsmit et al., 2020). Women who have experienced one abortion have a 15% risk of experiencing another, while those who have had two abortions face a 25% risk. These findings underscore the importance of providing appropriate care and support to women who have experienced an abortion to reduce the risk of recurrence. One of the factors contributing to recurrent abortion is the presence of an abnormal immune response in the mother. The growth of the trophoblast, the outer layer of the developing embryo, can suppress the stimulation of the IgG antibody system, leading to a decrease in IgG levels in the mother's blood and potentially resulting in the rejection of the pregnancy (Todd-Gher & Shah, 2020).

To address the risks associated with a history of abortion, healthcare providers should offer comprehensive care and support to women who have experienced an abortion. This includes monitoring for any underlying health conditions that may have contributed to the initial abortion, as well as providing counseling and support to address any psychological or emotional issues that may affect future pregnancies. By addressing these factors, healthcare providers can help reduce the risk of recurrent abortion and improve pregnancy outcomes for women with a history of abortion (Aiken et al., 2020). The relationship between a history of abortion and the incidence of subsequent abortions underscores the importance of providing targeted care and support to women who have experienced an abortion. By addressing the underlying factors that contribute to recurrent abortion, healthcare providers can help reduce the risk of complications in future pregnancies and improve overall maternal and child health outcomes (Bayefsky et al., 2020).

The relationship between a history of abortion and the incidence of subsequent abortions underscores the importance of providing targeted care and support to women who have experienced an abortion. By addressing the underlying factors that contribute to recurrent abortion, healthcare providers can help reduce the risk of complications in future pregnancies and improve overall maternal and child health outcomes (Bayefsky et al., 2020).

Conclusion

This study found several factors associated with the incidence of abortion at Sitti Fatimah Mother and Child Hospital Makassar. Maternal age had a significant association with the incidence of abortion, with pregnancies less than 20 years and more than 35 years at high risk of complications. Short spacing between pregnancies was also found to contribute to the incidence of abortion, as was abnormal nutritional status (hemoglobin level) and a history of previous abortions. However, no significant association was found between parity (number of previous births) and the incidence of abortion.

This study makes an essential contribution to medical science and practice, particularly in understanding the risk factors that influence the incidence of abortion. The results of this study can be used to develop more effective health policies to prevent abortion with a focus on managing pregnancies at risk through closer monitoring of maternal age, spacing, and nutritional status. The uniqueness of this study lies in the comprehensive analysis of various risk factors that have not been widely studied in this region.

However, this study has several limitations, such as uneven sample distribution and limited sample size, so the results may need to be more generalizable to a broader population. In addition, this study was only conducted in one hospital, which may limit the variety of data obtained. Future researchers are advised to conduct studies with a broader scope, both in terms of location and sample size, and consider other factors that may influence the incidence of abortion.

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