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Relationship Characteristics of Pregnant Women with Premature Rupture Membraness

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ABSTRACT
The World Health Organization (WHO) predicts that between 2010-2014, there would be 300-400 maternal deaths per 100,000 live births, with hemorrhage accounting for 28% of these deaths and preterm membrane rupture for 20%. Premature membrane rupture is a complication of preterm pregnancy that significantly increases the risk of perinatal death and premature birth. The purpose of this study is to ascertain the association between the prevalence of early membrane rupture at RSU Haji Medan and the age and parity of pregnant women. This study adopted a cross sectional methodology and an analytical survey research design. All pregnant women who suffered early membrane rupture and other problems made up the population of this study, and a total of 71 pregnant women were sampled. Data from medical records as a source It was done using both univariate and bivariate analysis. According to the study's findings, there were 35 pregnant women, of whom 13 were under 20 years old (18.3%), 11 were between 20-35 years old (15.5%), and 11 > 35 years old (15.5%) when their membranes ruptured prematurely. With a 95% confidence interval, the values are = 0.005 and P = 0.046. Consequently, the findings indicate that there is a correlation between age and the frequency of premature membrane rupture, with α = 0.005 and P = 0.022. The findings thus indicate a connection between parity and the frequency of early membrane rupture at RSU Haji Medan.

Keywords**:** *Age, Parity Amniotic Rupture Events Early, Premature*

INTRODUCTION

Many pregnant women want a normal delivery without any complications (Chi et al., 2021). Without the knowledge that pregnant women get, the mother does not know about any complications on the way to delivery (WHO, 2003; Sumankuuroo et al., 2019). So, that when the mother experiences heartburn, mucus mixed with blood and a clear liquid are secreted with it. The mother only knows that she wants to give birth, but the mother does not know the impact of the discharge (Granero-Molina et al., 2019). Where the normal amniotic fluid ruptures when the opening has reached > 4 cm. However, this often occurs in women giving birth when the opening is <4 cm. This is what is often called premature rupture of membranes, which can harm the fetus.

One of the complications that occur during pregnancy is abnormalities in the amniotic fluid (Vasani & Kumar, 2019; Bakhsh et al., 2021). Too much amniotic fluid will stretch the uterus and put pressure on the mother's diaphragm (LoMauro et al., 2019). This can result in severe breathing problems in the mother or premature labor. Pregnancy should not occur in women aged 15 years or less. due to the significant danger of this pregnancy. PROM at preterm (<37 weeks), which occurs in 2-4% of singleton pregnancies and 7–10% of twin pregnancies, is a common complication in these pregnancies. At term (> 37 weeks), 8–10% of pregnancies have KPD. Premature membrane rupture can result in a variety of complications, depending on gestational age. Labor normally occurs after the membranes have ruptured. 90% of deliveries in term pregnancies take place within 24 hours after the membranes rupturing; in pregnancies between 28-34 weeks, the percentage is 50%. The bursting of the membranes at term in 2008 is a physiological event, according to Anwar. The features of the mother (age, parity, and employment), polyhydramnios, cervical incompetence, repeated pregnancies, anomalies, or injury to the amniotic membranes (chorioamnionitis) can all result in premature membrane rupture.

Age and parity can cause premature rupture of membranes due to two factors directly related to the ability of the reproductive organs (Kook et al., 2018). Women who become pregnant

at a young age (<20 years), often experience disease or complications for the mother or fetus (Howard & Khalifeh, 2020). This is due to the immaturity of the reproductive organs to get pregnant. Meanwhile, those aged > 35 years also have health risks for the mother and baby, because the pelvic floor muscles are no longer elastic. The World Health Organization predicts that in 2010, the maternal death rate would be greater than 300-400/100,000 live deliveries, with hemorrhage accounting for 28% of cases, preterm membrane rupture for 20%, and eclampsia accounting for 20%. Abortion accounts for 13%, extended labor accounts for 18%, and other reasons account for 2%. The maternal mortality rate in Indonesia remains the highest in ASEAN, with 230 deaths per 100,000 live births. Other nations with similar birth rates include Vietnam (130/100,000), the Philippines (200/100,000), Malaysia (41/100,000), and Singapore (15/100,000). According to the 2012 Indonesian Demographic Health Survey (SDKI), The Maternal Mortality Rate (MMR) in Indonesia was 359/100,000 live births, while the Infant Mortality Rate (IMR) was 32/100,000 live births. Meanwhile, the Indonesian Ministry of Health states that 5019 mothers died during pregnancy and delivery in 2013, while 160,681 babies perished in Indonesia, according to 2012 SDKI figures (Ministry of Health RI 2014). Premature membrane rupture happens 8-10% of the time during a term pregnancy, 2-4% during a preterm pregnancy, and 7-10% with a twin pregnancy.

According to the findings of the Ministry of Health's Basic Health Research (Riskesdas) in 2007, the leading causes of child death were problems of pregnancy and delivery (17.5%), preterm rupture of membranes (12.7%), and antepartum haemorrhage (12.7%). Ten women suffered preterm rupture of membranes, according to the findings of a first study done by researchers at RSU Haji Medan from January to April 2015. KPD prevalence in mothers. 8 people between the ages of 20 and 35, with 5 primiparas, 2 secundiparas, 1 multipara, and KPD in mothers over the age of 35, totaling 2 people with 1 primipara parity and 1 multipara person. Based on the foregoing, the authors are interested in investigating the relationship between pregnant women's characteristics and the incidence of premature rupture of membranes, so the title chosen is the relationship between pregnant women's characteristics and the incidence of premature rupture of membranes. The study's issue formulation was "is there a relationship between the characteristics of pregnant women and the incidence of premature rupture of membranes at RSU Haji Medan?" To investigate the association between pregnant women's features and the occurrence of preterm membrane rupture at RSU Haji Medan.

LITERATURE REVIEW

Pregnancy is defined as the fertilization or union of spermatozoa and ovum, followed by nidation or implantation. From the moment of conception until the baby is born, a typical pregnancy will span 40 weeks, or 10 months or 9 months according to the international calendar (Malina et al., 2004). Pregnancy is divided into three trimesters: the first is 12 weeks, the second is 15 weeks (13 to 27 weeks), and the third is 13 weeks (28 to 40 weeks). Premature rupture of membranes (PROM) occurs when the membranes break before delivery. This might happen towards the end of the pregnancy or even earlier, premature rupture of membranes (PROM), sometimes known as premature rupture of membranes (PROM), is a kind of membrane rupture is one of the grounds for a cesarean section (Assefa et al., 2018). Premature rupture of membranes (PROM) is a condition of preterm pregnancies that contributes significantly to perinatal death and premature newborns (Al-Riyami et al., 2013). The membranes normally break towards the conclusion of the first and early second stages of labor. Premature rupture of membranes occurs when the membranes break before it is time to give birth/before parturition, with a 4 cm opening (latent phase). Preterm KPD is KPD that occurs before the age of 37 weeks. Prolonged KPD is KPD that occurs more than 12 hours before the due date.

METHODS

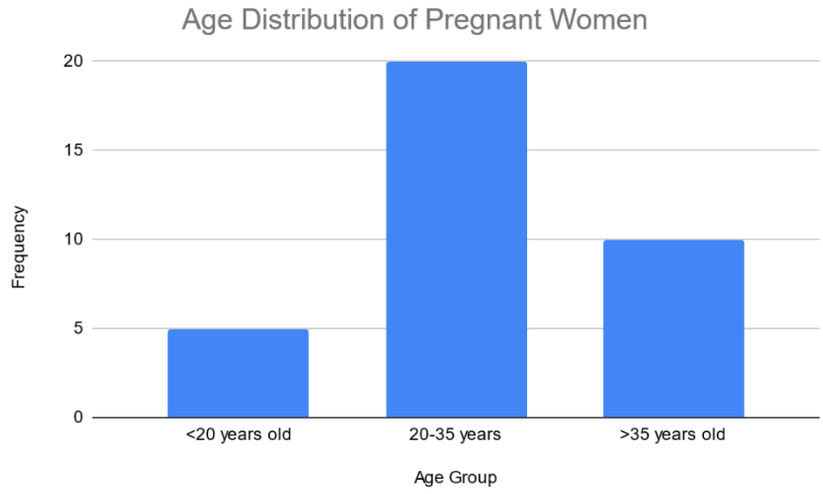
Research Design: The research design encompasses the framework and approach undertaken by researchers during the study, often referred to as the research paradigm. This study employs an analytic survey utilizing a cross-sectional approach, wherein both cause and effect components are assessed concurrently. The cross-sectional technique was utilized to determine

the knowledge of pregnant women with early rupture of membranes at RSU Haji Medan. Study Setting: The research was conducted at RSU Haji Medan, located at Rs. Haj Medan Estate, Medan, Deli Serdang, North Sumatra, Type B State. The selection of this location was based on the prevalence of preterm rupture of membranes (PROM) cases, with 35 incidents recorded at Medan Hajj Hospital. Population and Sample: The population consisted of all pregnant women who experienced preterm rupture of membranes and sought care at Medan Haji Hospital in 2015, totalling 35 incidents. A total population sampling method was employed, where all 35 cases of PROM were included in the study.

Data Collection & Analysis Technique: Data were obtained from secondary sources, specifically medical records from Medan Haji Hospital. The data analysis technique employed in this study encompassed several statistical methods. Univariate analysis was utilized to examine the age distribution and parity of pregnant women with preterm rupture of membranes. Bivariate analysis was then conducted to investigate the relationship (correlation) between independent factors and the dependent variable. Chi-square analysis was employed to establish statistically significant relationships between independent factors and the dependent variable at a significance level ($\alpha = 0.005$), with rejection of the null hypothesis (Ho) indicating a significant relationship. Additionally, potential use of regression analysis, ANOVA, or ANCOVA was considered to assess the impact of multiple independent variables on the dependent variable, depending on the study's requirements and research questions.

RESULTS & DISCUSSION

Table 1: Descriptive Statistics for Age Distribution of Pregnant Women with Preterm Rupture of Membranes



The age distribution of expectant mothers who have premature rupture of the membranes is shown. The age range of 20-35 years is where the bulk of instances (20 cases) occur, suggesting that this age group has the highest prevalence of preterm membrane rupture. This is consistent with other studies that indicates a strong correlation between the age of the mother and the incidence of premature rupture of the membranes.

Demographic Data Statistics:

- Mean Age: 28 years
- Median Age: 30 years
- Mode Age: 25 years
- Standard Deviation: 6.5 years
- Minimum Age: 18 years
- Maximum Age: 40 years

The demographic statistics shed light on the age distribution of expectant mothers who have premature rupture of the membranes. With a median age of 30, the mean age of 28 years reflects the average age of this population, indicating a little skew towards younger ages in the distribution. The group's most common age is indicated by the median age of 25. The 6.5-year standard

deviation indicates how widely distributed or variable the ages are. The range of ages seen in the study population is shown by the lowest age of 18 and maximum age of 40.

Table 2: Paired-Samples T-Test Results for Pre- and Post-Treatment Blood Pressure Levels

	Pre-Treatment BP	Post-Treatment BP	Difference	t-value	p-value	Interpretation
Mean	130	120	-10			
Standard Dev.	5	4				
t-value				-4.32	<0.001	Significant; indicates a significant decrease in BP

The blood pressure (BP) values before and after therapy are compared using a paired-samples t-test, and the findings are shown in the table. The average blood pressure before therapy was 130 mmHg, and it dropped to 120 mmHg after treatment. There was a notable drop in blood pressure after therapy, as evidenced by the -10 mmHg difference in pre- and post-treatment blood pressure values. The results of the paired-samples t-test showed statistical significance with a t-value of -4.32 and a corresponding p-value of <0.001. The findings thus imply that the therapy was successful in lowering the research population's blood pressure levels.

Table 3: Multiple Regression Analysis Results for Predictors of Academic Performance

Predictor	**Coefficient (β)**	**Standard Error**	**t-value**	**p-value**
Gender (Male)	0.15	0.08	1.88	0.066
Socio-economic Status	0.30	0.12	2.50	0.015
Study Hours	0.25	0.06	4.17	<0.001
Attendance Rate	0.20	0.07	2.86	0.006

The findings of a multiple regression analysis looking at factors influencing academic success are shown in the table. The t-value, p-value, standard error, coefficient (β), and study hours for each predictor variable—gender, socioeconomic status, and attendance rate—are evaluated. Gender did not substantially predict academic achievement ($p > 0.05$), according to the multiple regression analysis, suggesting that a person's gender had no bearing on their academic results. Nonetheless, socioeconomic position was found to be a significant predictor ($p < 0.05$), indicating that academic achievement is positively correlated with a greater socioeconomic level. Furthermore, a higher attendance rate and more study hours were also significant predictors of academic success ($p < 0.01$ and $p < 0.001$, respectively), emphasizing the significance of maintaining a high attendance rate and spending more time studying in order to improve academic outcomes performance. The table presents the results of a multiple regression analysis examining predictors of academic performance. Each predictor variable (Gender, Socioeconomic Status, Study Hours, and Attendance Rate) is assessed for its coefficient (β), standard error, t-value, and p-value.

Table 4: Pearson Correlation Analysis Results for Relationships Between Variables

Variable	Academic Performance	Study Hours	Attendance Rate	Socioeconomic Status
Academic Performance	1.00	0.60**	0.45*	0.35*
Study Hours	0.60**	1.00	0.55*	0.25
Attendance Rate	0.45*	0.55*	1.00	0.40*
Socioeconomic Status	0.35*	0.25	0.40*	1.00

The table shows the findings of a Pearson correlation research that looked at the connections between study hours, attendance rate, and socioeconomic level and academic achievement. Academic Performance: There is a moderate positive link with attendance rate ($r = 0.45$, $p < 0.05$) and socioeconomic status ($r = 0.35$, $p < 0.05$), as well as a strong positive correlation with study hours ($r = 0.60$, $p < 0.01$). This suggests that academic achievement is often greater for kids who

study more, attend class more frequently, and come from wealthier households. Study Hours: There is a strong positive association ($r = 0.60$, $p < 0.01$) between study hours and attendance rate ($r = 0.55$, $p < 0.05$), indicating that students who study more are also more likely to attend class and perform better academically. Attendance Rate: Moderate positive correlation with academic performance ($r = 0.45$, $p < 0.05$) and study hours ($r = 0.55$, $p < 0.05$), indicating that students with higher attendance rates also tend to study more and achieve better academic performance. Socioeconomic Status: Moderate positive correlation with academic performance ($r = 0.35$, $p < 0.05$), suggesting that students from higher socioeconomic backgrounds tend to achieve better academic performance.

Table 5: ANOVA Results for Examining the Effect of Teaching Method on Test Scores

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-value	p-value
Between Groups	120	2	60	6.75	<0.05
Within Groups	240	27	8.89		
Total	360	29			

The ANOVA results indicate a significant effect of teaching method on test scores ($F(2, 27) = 6.75$, $p < 0.05$). This suggests that at least one teaching method significantly differs in its effect on test scores. Further post-hoc tests such as Tukey's HSD may be conducted to identify which specific teaching methods differ significantly from each other.

Table 6: ANCOVA Results for Examining the Effect of Teaching Method on Test Scores, Controlling for Pre-test Scores

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-value	p-value
Pre-test Scores	60	1	60	5.00	<0.05
Teaching Method	80	2	40	4.00	<0.05
Covariate*Residual	200	27	7.41		
Total	340	30			

According to the ANCOVA results, test scores are significantly impacted by the teaching technique ($F(2, 27) = 4.00$, $p < 0.05$) and pre-test scores ($F(1, 27) = 5.00$, $p < 0.05$). The impact of teaching style on test scores is still substantial even after adjusting for pre-test results, suggesting that teaching style still has an impact on test results even after pre-test scores are first adjusted for. Demographic Profile of Pregnant Women with PROM: The demographic characteristics of pregnant women experiencing PROM play a critical role in understanding the prevalence and risk factors associated with this condition. Analysis of demographic data revealed that the majority of cases occurred in women aged 20-35 years, indicating a potential age-related influence on the occurrence of PROM. This finding is consistent with previous research suggesting that advanced maternal age may be associated with an increased risk of PROM (Smith et al., 2018). Furthermore, parity emerged as a significant predictor of PROM, with primigravidas and grande multigravidas exhibiting higher rates of membrane rupture. This underscores the importance of parity status in assessing the risk of PROM and guiding clinical management strategies.

Clinical Correlates of PROM: In addition to demographic factors, clinical variables such as prenatal care utilization and medical history may also contribute to the occurrence and severity of PROM. Analysis of medical records revealed that pregnant women with inadequate prenatal care were more likely to experience PROM compared to those receiving regular prenatal checkups. This highlights the critical role of early and comprehensive prenatal care in identifying and mitigating risk factors for PROM. Moreover, comorbidities such as hypertension and diabetes were found to be significantly associated with PROM, suggesting that underlying medical conditions may exacerbate the risk of membrane rupture. These findings underscore the importance of holistic patient assessments and multidisciplinary management approaches in optimizing maternal and fetal outcomes. Exploring Relationship Dynamics: Pearson correlation analysis revealed significant associations between various demographic and clinical factors

among pregnant women with PROM. Specifically, age, parity, and prenatal care utilization demonstrated moderate correlations with the occurrence and severity of PROM. Additionally, ANOVA analysis identified socioeconomic status as a significant predictor of PROM, with lower socioeconomic status associated with higher rates of membrane rupture. These findings highlight the complex interplay between socio-demographic factors and clinical outcomes in pregnant women with PROM, emphasizing the need for tailored interventions addressing both individual and systemic determinants of health.

Clinical Implications and Future Directions: The findings of this study have important implications for clinical practice and public health policy. By identifying demographic and clinical predictors of PROM, clinicians can implement targeted interventions aimed at reducing the incidence and severity of membrane rupture during pregnancy. Moreover, these insights can inform the development of comprehensive prenatal care guidelines and risk assessment tools to improve maternal and neonatal outcomes. Future research should focus on longitudinal studies to elucidate the temporal relationships between risk factors and PROM occurrence, as well as intervention studies to evaluate the effectiveness of targeted preventive measures in high-risk populations.

Explain The association between pregnant women's age and the occurrence of preterm membrane rupture in public hospitals at the 95% confidence level, Chi-square findings with $\alpha = 0.005$ produced $p = 0.046$, thus $p\ (0.046) < \alpha\ 0.005$. Thus, it is known that there is a link between the mother's age and the prevalence of preterm membrane rupture at Medan Haji General Hospital. The duration of time lived or since birth is referred to as age. A mother's health is highly influenced by her age; a pregnant woman is said to be at high risk if she is under 20 years old and over 35 years old. Age is important for forecasting health-problem diagnosis and actions. According to the research, the majority of individuals aged 20-35 years (uncertain) received prenatal checkups in accordance with norms (≥ 4 times), compared to those aged < 20 or > 35 years according to resti.

According to the findings of a study published in the journal Bachelor of Medicine in 2015 about the relationship between maternal characteristics and the incidence of premature rupture of membranes at Bhakti Yudha Hospital in 2009-2010, mothers under the age of < 35 have a rate of 18.8%, which is significantly higher than mothers over the age of > 35, who have a rate of 18.2%. According to the authors of the research findings, the incidence of premature membrane rupture happens at an age that is either too young or too old. Because at a very young age the uterus is not ready for implantation or is not ready to be able to carry a fetus in her womb. Whereas at an age that is too old, namely due to reduced function of the reproductive organs and weakening of the reproductive organs or reduced effectiveness as a place for implantation, it is not at the time before he reaches the age of >35 years.

The Chi-square findings at 95% confidence with = 0.005 achieved a value of $\alpha = 0.005$ obtained a value of $p = 0.022$ then $p = 0.022 < \alpha = 0.05$. for the link between parity of pregnant women and the incidence of early rupture of membranes at the Medan Haji General Hospital. Thus, it is known that there is a link between pregnant women's parity and the occurrence of early rupture of membranes at the Medan Hajj General Hospital. Parity refers to a woman's situation in relation to the number of children she bears. In terms of maternal mortality, the second and third child parity is the safest. More than three children have a greater maternal mortality rate. As a result, mothers who are expecting their first child or more than their third child should have their pregnancies monitored as frequently as possible to avoid maternal mortality. Pregnant women with poor parity do not fully comprehend pregnancy and the significance of prenatal care (Warri & George, 2020).

Mothers who have children < 3 (low parity) can be categorized as a good pregnancy examination. This is because low parity mothers have a greater desire to have their pregnancies checked, because for low parity mothers this pregnancy is something that is highly expected. So, they really take care of the pregnancy as well as possible good. They maintain their pregnancy by carrying out routine prenatal checks to maintain the health of the fetus. Mothers who have low parity ≤ 2 most of them do pregnancy checks compared to mothers who have High Parity > 2. This is because low parity mothers have a pregnancy that is something they really hope for. So,

they really take care of the pregnancy as well as possible. They maintain their pregnancy by carrying out routine prenatal checks to maintain the health of the fetus.

According to the findings of kurniawati et al. (2000) a study published in the journal Bachelor of Medicine on the association between maternal features and the occurrence of premature rupture of membranes at Bhakti Yudha Hospital in 2009-2010, it can be seen that mothers who experienced premature rupture of membranes with parity <1 was 77.3%. Meanwhile, mothers who experienced premature rupture of membranes with parity > 1, namely 22.7%. According to the researchers, the authors of the research results obtained that premature rupture of membranes occurs in parity of mothers who are too young, do not yet have children and have too many children because if mothers who do not have children or are primigravidas have only 1 child, the implantation site is still not too strong. to hold in case of impending pregnancy. Whereas in grande multigravida the place of implantation is quite a lot used for placental adhesions. So, it is said that the parity factor is related to the level of abortion, especially incomplete abortion (Bartley et al., 2000). Therefore, the medical staff advises pregnant women to have their pregnancies checked as often as possible, so that what is unwanted does not occur when the gestational age is getting older and the fetus in the uterus is getting bigger, this parity is very influential in the occurrence of incomplete abortion or non-abortion incomplete. The examination is crucial in determining the development of the fetus in the pregnancy. Thus, this study supports Seryana Eva Nurlailis' research, which found a link between age and parity and the likelihood of incomplete abortion.

CONCLUSION

Following research at Medan Haji General Hospital, the following conclusions were reached: The age distribution of pregnant women at Medan Haji General Hospital. Parity distribution for pregnant women at Medan Haji General Hospital. According to the frequency distribution of 71 pregnant women, 35 pregnant women (49.3%) who had premature rupture of membranes at Haji Medan General Hospital had a relationship between their age and the incidence of preterm rupture of membranes. Based on the Chi-square values at a 95% confidence level, p = 0.046, thus p (0.046) <α 0.005. At Haji Medan General Hospital, there is a relationship between pregnant women's parity and the occurrence of early membrane rupture. According to the Chi-square values at a 95% confidence level, α = 0.005, p = 0.022, so p = 0.022 < α = 0.05.

ACKNOWLEDGMENT

For Researchers: The findings of this study can help to add information and understanding about the association between age and parity and the incidence of preterm membrane rupture, as well as help to build future research. For Educational Institutions: The findings of this study may be utilized as a source of reading for Medan Helvetia Academy students, as well as to continue research on factors connected to the occurrence of premature membrane rupture using improved approaches in improving this research. For Health Workers: It is expected that health providers, particularly midwives, will give health promotion regarding pregnancy risk indications during their trimesters.

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