

Association Between Parity and Premature Rupture of Membranes Among Women in Labor at Kotaanyar Community Health Center

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ABSTRACT

Introduction: Premature Rupture of Membranes (PROM) is one of the obstetric complications that contributes to increased maternal and neonatal morbidity and mortality. One factor suspected to be associated with the occurrence of PROM is parity, as changes in the structure of the uterus and cervix resulting from previous deliveries can affect the strength of the amniotic membranes. This study aims to analyze the relationship between parity and the incidence of Preterm Rupture of Membranes among women in labor at the Kotaanyar Community Health Center in Probolinggo Regency in 2024.

Method: An observational analytical design with a cross-sectional approach was used. The study population consisted of all women in labor at the Kotaanyar Community Health Center in 2024, totaling 278 deliveries. The sample consisted of 84 respondents selected using total sampling with inclusion and exclusion criteria. Data were obtained from medical records and the Maternal and Child Health (MCH) booklet, then analyzed using the chi-square test with a significance level of 5% ($\alpha = 0.05$).

Results: showed that the majority of respondents were nulliparous mothers, totaling 39 (46.4%). The incidence of KPD and non-KPD cases was equal, with 42 respondents in each group (50%). Bivariate analysis yielded a p-value of 0.101 ($p > 0.05$).

Conclusion: There is no significant association between parity and the incidence of preterm rupture of membranes (PROM). However, women with higher parity are at greater risk of experiencing preterm rupture of membranes (PROM). Therefore, improved health education and optimized antenatal care (ANC) services are needed to support the early detection and prevention of preterm rupture of membranes (PROM).

Keywords: Parity; Premature Rupture of Membranes; Women in Labor; Antenatal Care; Risk Factors

Introduction

Premature Rupture of Membranes (PROM) is an obstetric complication that remains a significant health issue for mothers and infants, as it contributes to increased maternal and neonatal morbidity and mortality. PROM is the rupture of the amniotic membranes before the onset of labor signs, which can increase the risk of intrauterine infection, preterm birth, neonatal sepsis, and even perinatal death. Therefore, prevention and early detection of factors associated with PPL are crucial components of efforts to improve the quality of maternal health care.

Globally, the incidence of PPL is reported to range from 5–15% of all pregnancies. In Indonesia, PPL remains one of the most common complications of childbirth and contributes to high rates of obstetric referrals. Medical record data from the Kotaanyar Community Health Center in Probolinggo Regency for the year 2024 show that out of 278 deliveries, there were 142 cases referred to hospitals, with 42 of these cases caused by premature rupture of membranes (PROM). This situation indicates that PROM remains an issue requiring special attention in maternal health care at the primary care level.

Various factors are thought to be associated with the occurrence of preterm premature rupture of membranes (PPROM), including maternal age, infection, anemia, a history of PPRM, multiple pregnancies, fetal presentation, and parity. Parity refers to the number of previous deliveries a mother has experienced and is often associated with physiological changes in the uterus and cervix. In mothers with high parity, repeated stretching of the uterus is thought to cause a decrease in tissue elasticity, thereby increasing the risk of premature rupture of membranes before labor. Conversely, mothers with low parity or in their first pregnancy may also experience PROM due to other factors, such as the immaturity of the reproductive organs, infections, or certain obstetric conditions.

Although several studies have reported an association between parity and the incidence of PPL, existing research findings remain inconsistent. Some studies suggest that multiparous and grandemultiparous women have a higher risk of PPL, while others indicate that parity is not a significantly associated factor after accounting for other maternal factors. Differences in population characteristics, sample size, and health care

conditions across regions mean that the study's findings cannot yet be generalized. Furthermore, research on the association between parity and preterm rupture of membranes at primary health care facilities particularly at the Kotaanyar Community Health Center in Probolinggo Regency remains very limited. These circumstances represent a research gap that underscores the importance of this study.

This research is urgent because it is expected to provide scientific evidence regarding the relationship between parity and the incidence of preterm rupture of membranes among women in labor at the Kotaanyar Community Health Center. The research findings are expected to serve as a basis for developing strategies for pregnancy risk screening, improving health education for pregnant women, and optimizing antenatal care (ANC) services so that complications resulting from preterm rupture of membranes can be prevented as early as possible.

Based on this background, this research aims to analyze the relationship between parity and the incidence of premature rupture of membranes among women in labor at the Kotaanyar Community Health Center in Probolinggo Regency in 2024.

Method

This study employed an observational analytical research design with a cross-sectional approach, which aims to analyze the relationship between independent and dependent variables at the same point in time. The independent variable in this study was parity, while the dependent variable was the occurrence of premature rupture of membranes in laboring women.

The study was conducted at the Kotaanyar Community Health Center in Probolinggo Regency, East Java. Data collection took place from April to May 2025 using medical records of laboring mothers from January through December 2024.

The study population consisted of all 278 laboring mothers registered at the Kotaanyar Community Health Center during 2024. The sample size was determined using the Slovin formula with a 10% margin of error, resulting in 74 respondents. To account for potential data incompleteness, the sample size was increased by approximately 10%, bringing the total sample to 84 respondents. The sample was selected using simple random sampling, with inclusion criteria limited to mothers with

complete medical records regarding parity and the occurrence of premature rupture of membranes; medical records with missing information were excluded from the study. Univariate data analysis was performed to describe the frequency distribution of respondent characteristics, parity, and the occurrence of premature rupture of membranes. Bivariate analysis was then conducted using the chi-square test with a 95% significance level ($\alpha = 0.05$) to determine the association between parity and the occurrence of premature rupture of membranes. An association was considered significant if the p-value was less than 0.05.

Results

This study involved 84 women in labor who met the inclusion criteria at the Kotaanyar Community Health Center in Probolinggo Regency. An analysis was conducted to determine the distribution of parity, the incidence of premature rupture of membranes, and the relationship between these two variables.

Table 1. Distribution of Respondents by Parity

Parity	Frequency (n)	Percentage (%)
Nullipara	39	46,4
Primipara	19	22,6
Multipara	23	27,4
Grandemultipara	3	3,6
Total	84	100,0

Source: Data Primary, 2026

According to Table 1, the majority of respondents were nulliparous, totaling 39 women (46.4%), while the smallest group consisted of grandemultipara women, totaling 3 women (3.6%).

Table 2. Distribution of Premature Rupture of Membranes

Premature Rupture of Membranes	Frequency (n)	Percentage (%)
Yes	42	50,0
No	42	50,0
Total	84	100,0

Source: Data Primary, 2026

The results of the study showed that the proportion of mothers who experienced premature rupture of membranes and those who did not was the same, with 42 respondents in each group (50.0%).

Table 3. The Relationship Between Parity and Premature Rupture of Membranes

Parity	Premature Rupture of Membranes	No premature rupture of membranes	Total <i>p-value</i>
Nullipara	16 (41,0)	23 (59,0)	39 (46,42)
Primipara	11 (57,9)	8 (42,1)	19 (22,61)
Multipara	13 (56,5)	10 (43,5)	23 (27,38)
Grandemultipara	2 (66,7)	1 (33,3)	3 (3,57)
Total	42 (50,0)	42 (50,0)	84 (100,0)

Source: Data Primary, 2026

Based on the results of a bivariate analysis using the chi-square test, a *p*-value of 0.101 ($\alpha = 0.05$) was obtained. This value indicates that there is no significant association between parity and the incidence of premature rupture of membranes among women in labor at the Kotaanyar Community Health Center in Probolinggo Regency.

Discussion

The results of the study showed that the majority of respondents were nulliparous mothers (46.4%), while the proportions of cases with and without premature rupture of membranes were 50.0% each. Based on the results of the Chi-Square test, a *p*-value of 0.101 ($p > 0.05$) was obtained, indicating no significant association between parity and the incidence of ruptured membranes among women giving birth at the Kotaanyar Community Health Center in Probolinggo Regency. Thus, the hypothesis stating that there is an association between parity and the incidence of ruptured membranes cannot be accepted.

Theoretically, parity is one of the factors suspected to influence the incidence of premature rupture of membranes. Women with high parity, particularly multiparas and grandemultiparas, experience repeated uterine stretching and changes in cervical structure, which can reduce the elasticity of the tissues supporting the amniotic membranes. These conditions have the potential to increase the vulnerability of the amniotic membranes to rupture before labor. Conversely, mothers with low parity or in their first pregnancy are still at risk of premature rupture of membranes due to other factors, such as infection, anemia, advanced maternal age, strenuous physical activity, or other obstetric complications. Therefore, parity is not the sole factor determining the occurrence of premature rupture of membranes.

The results of this study are consistent with several previous studies that reported that parity has no significant association with the incidence of premature rupture of membranes following statistical analysis. The lack of a significant association suggests that the incidence of premature rupture of membranes is a multifactorial condition. The influence of parity may be diminished when other, more dominant risk factors are present, such as reproductive tract infections, anemia during pregnancy, a history of premature rupture of membranes in a previous pregnancy, multiple pregnancies, fetal malpresentation, or increased intrauterine pressure. Thus, the occurrence of premature rupture of membranes cannot be explained solely by the number of previous deliveries a mother has experienced.

Although no significant association was found, the data distribution indicates that the proportion of preterm rupture of membranes tends to be higher in the multiparous and grandmultiparous groups compared to the nulliparous group. However, the number of respondents in the grandmultiparous group was relatively small, limiting the statistical power of the analysis. This situation allows for differences in proportions that have not yet been shown to have a statistically significant association.

The findings of this study suggest that efforts to prevent preterm rupture of membranes should not be focused solely on mothers with a specific parity but should also be extended to all pregnant women through comprehensive antenatal care (ANC). Screening for other risk factors such as anemia, infections, gestational age, obstetric history, and fetal condition should be conducted routinely to enable earlier detection of complications. Education regarding warning signs of pregnancy complications, adherence to prenatal checkups, and the importance of maintaining health during gestation also needs to be continuously improved.

This study has several limitations. First, the study used a cross-sectional design, so it can only describe the relationship between variables and cannot explain a cause-and-effect relationship. Second, the data used were secondary data from medical records, so the researchers relied on the completeness and accuracy of the records. Third, the study analyzed only one risk factor—parity—and thus did not account for the influence of other factors that could also potentially affect the incidence of premature rupture of membranes. Therefore, future studies are advised to use a stronger analytical

design, such as a cohort or case-control study, incorporating multiple risk variables to provide a more comprehensive understanding of the determinants of premature rupture of membranes.

This study aims to analyze the relationship between parity and the incidence of premature rupture of membranes among women in labor at the Kotaanyar Community Health Center in Probolinggo Regency in 2024. Based on the results of the analysis using the Chi-Square test, a p-value of 0.101 ($p > 0.05$) was obtained; therefore, it can be concluded that there is no significant association between parity and the incidence of premature rupture of membranes among parturient women at the Kotaanyar Community Health Center in Probolinggo Regency. These findings suggest that the incidence of premature rupture of membranes is likely influenced by various factors other than parity. Therefore, efforts to prevent and detect premature rupture of membranes early on should be carried out through comprehensive antenatal care (ANC) services that take into account various maternal and obstetric risk factors.

Conclusion

There was no significant association between the number of previous births and the incidence of preterm rupture of membranes (PROM). However, women with a higher number of previous births had a higher risk of preterm rupture of membranes (PROM). Therefore, improved health education and optimized antenatal care (ANC) services are needed to support the early detection and prevention of preterm rupture of membranes (PROM). For future researchers, this could serve as a basis for analyzing the factors that influence the incidence of preterm rupture of membranes and for determining preventive measures to minimize its occurrence.

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