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Factors Associated with Preterm Delivery at RSUD Buleleng

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ABSTRACT

Preterm birth, defined as delivery before 37 completed weeks of gestation, is one of the leading causes of neonatal morbidity and mortality worldwide. This condition can be influenced by various factors, including obstetric and sociodemographic factors. This study aimed to identify the factors associated with preterm birth at the Regional Public Hospital (RSUD) of Buleleng Regency. A case-control study design with a retrospective approach was employed from January to March 2025. The accessible population included all preterm births at RSUD Buleleng from January to December 2024. A total of 268 respondents (134 cases and 134 controls) were selected using simple random sampling. The results showed significant associations between maternal age and preterm birth ($p < 0.001$; AOR 6.565; 95% CI 3.119-13.817), employment status ($p = 0.007$), parity ($p = 0.002$), premature rupture of membranes ($p < 0.001$; AOR 6.207; 95% CI 2.123 – 18.148), and threatened preterm labor ($p < 0.001$; AOR 4.150; 95% CI 2.137 – 8.059). No significant association was found between educational level or history of preeclampsia and preterm birth. Maternal age was identified as the most dominant predictor. These findings highlight the importance of early detection by healthcare providers to prevent preterm birth and its associated complications.

INTRODUCTION

Preterm birth, defined as delivery before 37 weeks of gestation, remains one of the major global health concerns. According to the World Health Organization (WHO), an estimated 13.4 million babies were born preterm worldwide in 2020, with more than 1 million infant deaths in 2019 attributed to complications of premature birth. Preterm birth is also the leading cause of death among children under five years of age globally. Moreover, many surviving preterm infants face long-term health challenges, such as hearing and vision impairments, as well as learning disabilities.(1)

In Indonesia, preterm birth continues to be a primary cause of infant mortality. The rates of preterm birth and low birth weight (LBW) remain high. Preterm birth is almost always accompanied by LBW. The prevalence of preterm birth in Indonesia ranges from 7–14%, and in some districts it reaches as high as 16%. This prevalence is higher than in several developing countries (5–9%) and also exceeds the rates in the United States (12–13%). The national prevalence of LBW is 11.5%, with 16 provinces reporting rates above the national average.(2)

According to the 2023 Indonesian Health Survey, 2.9% of deliveries in Bali Province were reported to experience other complications.(3) Consistent with these findings, the Bali Provincial Health

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Office reported that in 2023, among neonatal deaths within the 0–28 day age group, the leading cause was LBW and prematurity (28%), followed by other causes (21%), congenital anomalies (13%), asphyxia (18%), and infections (14%).[4] In the same year, neonatal mortality due to LBW and prematurity remained high, with Buleleng Regency recording the highest number of cases, totaling 44 deaths. Furthermore, data from the Buleleng District Health Office showed that by 2023, there were still 64 live births classified as premature.[5]

Preterm birth specifically exposes newborns to severe complications such as respiratory distress, hypothermia, and infections, all of which may adversely affect long-term quality of life. In addition, premature infants often have underdeveloped organ systems, requiring intensive care.[6] Given the complexity of the issue, research on factors contributing to preterm birth is urgently needed. The causes of preterm birth are multifactorial, involving not only biological factors such as infections or maternal health conditions (e.g., hypertension, gestational diabetes), but also social, economic, and environmental determinants. Lifestyle factors such as smoking, alcohol consumption, and psychological stress are also known to increase the risk of preterm birth. Moreover, access to healthcare services, particularly regular and high-quality antenatal care, plays a crucial role in preventing pregnancy complications that can lead to premature delivery.[7]

Based on health data from Bali Province, Buleleng Regency has consistently recorded the highest prevalence of prematurity cases in the region. The Buleleng District General Hospital (RSUD Buleleng), as one of the referral healthcare facilities in the area, plays an essential role in managing pathological deliveries, including preterm births. A preliminary study conducted by the researchers in 2024 indicated a considerable number of preterm deliveries within the past three months. From January to December 2024, preterm deliveries accounted for 24.3% of all births at RSUD Buleleng. In December 2024, the proportion reached 33.33%, followed by 35.3% in November, and 18.6% in October.

These findings highlight that preterm birth is a significant maternal health issue at RSUD Buleleng. Furthermore, initial observations suggest that no prior research has examined the factors influencing preterm delivery at this hospital. Therefore, this study aims to determine the factors associated with preterm birth at RSUD Buleleng and to identify the most influential determinant. The findings are expected to contribute to a better understanding of preterm birth and to support the development of more effective prevention and management strategies.

METHOD

This study applied a retrospective case–control design conducted at Buleleng District General Hospital, Bali, from January to March 2025. The population comprised all deliveries recorded from January to December 2024, with 215 preterm cases identified. A total sample of 268 respondents was obtained, consisting of 134 preterm (case) and 134 term (control) deliveries, selected through probability sampling with a simple random technique. Inclusion criteria were mothers with complete medical records. Exclusion criteria were multiple pregnancies, maternal death, or incomplete records.

Data were collected from secondary sources using a structured checklist covering maternal age, education level, employment status, parity, preeclampsia, premature rupture of membranes (PROM), and threatened preterm labor (TPL). Although infectious diseases during pregnancy are acknowledged as important risk factors for preterm birth, they were not included in this study because infection-related data were not consistently available in the hospital's medical records. In line with the inclusion criteria, only cases with complete and readable records on the selected study variables were analyzed, while patients with unreadable records, maternal death during care, or multiple pregnancies were excluded to maintain the validity of the findings. Data processing involved editing, coding, tabulation, and analysis with SPSS version 25.0. Univariate analysis described variable distributions, bivariate analysis applied Chi-square with odds ratio (OR) calculation, and multivariate analysis used binary logistic regression

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to identify determinants of preterm birth. Ethical approval was granted by the Ethics Committee of Poltekkes Kemenkes Denpasar and all procedures complied with the principles of respect for persons, beneficence, non-maleficence, and justice.

RESULT AND DISCUSSION

Characteristics of Study Subjects

The characteristics of the study subjects were observed based on type of delivery, maternal age, education level, employment status, parity, history of preeclampsia, history of premature rupture of membranes (PROM), and history of threatened preterm labor (TPL). These characteristics are presented in the following table.

Table 1. Characteristics of Study Subjects

Characteristics	Frequency (f)	Percentage (%)
Delivery		
Preterm	134	50
Term	134	50
Maternal Age		
Non-risk	185	69
Risk	83	31
Educational Level		
Primary education	260	97
Higher education	8	3
Employment Status		
Employed	49	18.3
Unemployed	219	81.7
Parity		
Non-risk	255	95.1
Risk	13	4.9
History of Preeclampsia		
No	258	96.3
Yes	10	3.7
History of PROM		
No	216	80.6
Yes	52	19.4
History of TPL		
No	163	60.8
Yes	105	39.2
Total	268	100

Based on Table 1, the study sample consisted of 134 cases (50%) and 134 controls (50%). Regarding maternal age, 185 respondents (69%) were in the non-risk category (20–35 years), while 83 (31%) were classified as high risk (<20 or >35 years). In terms of education level, the majority of respondents had primary education (97%), and only 3% had higher education. With respect to employment status, most respondents were unemployed (81.7%), while 18.3% were employed. In terms of parity, 95.1% respondents were in the non-risk category, and 4.9% were considered at risk. Concerning the history of preeclampsia, 96.3% respondents had no such history, while 3.7% reported preeclampsia. A total of 80.6% respondents did not experience premature rupture of membranes

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(PROM), while 19.4% had a history of PROM. Furthermore, 60.8% respondents had no history of threatened preterm labor (TPL), while 39.2% were reported with a history of TPL.

Preterm delivery is defined as childbirth occurring before 37 completed weeks of gestation. It can be influenced by various factors, both obstetric and sociodemographic. Given the ongoing challenges observed at RSUD Buleleng, this study focuses on identifying the maternal and obstetric factors associated with preterm delivery, with the aim of clarifying which determinants contribute most significantly to its occurrence.

Maternal age is one of the factors related to preterm delivery. Mothers who are too young (<20 years) or too old (>35 years) are at higher risk due to physical immaturity or the physiological decline of the reproductive system. In this study, 31% of respondents fell into the risk age group. Ratnaningtyas and Indrawati (2023) reported that hormonal imbalance, chronic conditions such as hypertension, and reduced uterine elasticity at advanced maternal age may trigger preterm birth.[8] Meanwhile, among younger mothers, insufficient biological and psychological readiness may also act as potential triggers. Therefore, although the majority of respondents were in the non-risk age category, the proportion of those at risk was still significant enough to contribute to preterm cases.

Educational level is also an important determinant in understanding preterm delivery. Most respondents in this study had only primary education 97%, while only 3% attained higher education. Lower education levels may limit mothers' ability to understand health information, recognize danger signs during pregnancy, and undertake preventive measures.[9] This limitation also affects adherence to antenatal visits and optimal utilization of healthcare services.

Employment status revealed that the majority of respondents were unemployed (81.7%). Economic inactivity may restrict access to quality healthcare services, including transportation to health facilities, purchase of pregnancy supplements, or additional medical examinations.[10] Such limitations may ultimately affect maternal health during pregnancy and increase the risk of complications such as preterm delivery.

The findings of this study further indicated that most respondents were not at risk in terms of parity (95.1%) or history of preeclampsia (96.3%). However, two clinical factors stood out, namely premature rupture of membranes (PROM) (19.4%) and threatened preterm labor (TPL) (39.2%). According to basic obstetric theory, PROM may lead to intrauterine infection and premature uterine contractions, which directly trigger preterm labor. Meanwhile, TPL is a clinical condition that almost invariably results in preterm delivery if not managed intensively.[11] Mitrogiannis et al. (2023) further emphasized that direct risk factors such as infection, inflammation, and uterine distension exert a greater influence on preterm birth compared to sociodemographic factors. This aligns with the present study, where despite low risk contributions from demographic variables, the incidence of preterm delivery remained high due to strong clinical influences such as PROM and TPL.

The Association Between Sociodemographic Factors (Age, Education Level, and Employment Status) and the Incidence of Preterm Birth at RSUD Buleleng

Table 2. The Association Between Sociodemographic Factors and the Incidence of Preterm Birth at RSUD Buleleng

Variable	Preterm		Term		Total		*P value*	*COR (CI 95%)*
	f	*%*	*f*	*%*	*f*	*%*		
Maternal Age								9.009
Non-risk	65	35.1	120	64.9	185	100	< 0.001*	(4.755-17.412)
Risk	69	83.1	14	16.9	85	100		
Educational Level								
Primary education	131	50.4	129	49.6	260	100		1.693
Higher education	3	37.5	5	62.5	8	100	0.473	(0.396-7.229)

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Variable	Preterm		Term		Total		*P value*	*COR (CI 95%)*
	f	*%*	*f*	*%*	*f*	*%*		
Employment Status								2.410
Employed	16	32.7	33	67.3	49	100	0.007*	(1.254-4.632)
Unemployed	118	53.9	101	46.1	219	100		
Total	134		134		268			

*COR : Crude Odds Ratio, CI: confidence interval, * (p-Value <0.05)*

The results of the bivariate analysis showed a significant association between maternal age and preterm birth, with a p-value of <0.001, indicating that H0 was rejected and Ha was accepted. This finding suggests that maternal age is significantly associated with the incidence of preterm delivery. In contrast, the association between education level and preterm birth yielded a p-value of 0.473, meaning that H0 was accepted, and thus education level was not associated with preterm birth. Meanwhile, the analysis of employment status and preterm birth produced a p-value of 0.007, indicating a significant relationship between employment status and the incidence of preterm delivery.

Variables with a p-value <0.25 in the bivariate analysis were subsequently included in the multivariate analysis. The results of the multivariate analysis regarding factors associated with preterm birth are presented in Table 4.

The Association Between Obstetric Factors (Parity, Preeclampsia, Premature Rupture of Membranes, and Threatened Preterm Labor) and the Incidence of Preterm Birth at RSUD Buleleng

Table 3. The Association Between Obstetric Factors and the Incidence of Preterm Birth at RSUD Buleleng

Variable	Preterm		Term		Total		*P value*	*COR (CI 95%)*
	f	*%*	*f*	*%*	*f*	*%*		
Parity								13.082
Non-risk	122	47.8	133	52.2	255	100	0.002*	(1.676 -102.102)
Risk	12	92.3	1	7.7	13	100		
History of Preeclampsia								1.523
Non-risk	128	49.6	130	50.4	258	100	0.519	(0.420-5.526)
Risk	6	60	4	40	10	100		
History of PROM								13.938
Non-risk	87	40.3	129	59.7	216	100	< 0.001*	(5.330-36.446)
Risk	47	90.4	5	9.6	52	100		
History of TPL								7.610
Non-risk	52	31.9	111	68.1	163	100	< 0.001*	(4.314-13.427)
Risk	82	78.1	23	21.9	105	100		
Total	134		134		268	100		

*COR : Crude Odds Ratio, CI: confidence interval, * (p-Value <0.05)*

The results of the bivariate analysis showed that parity was significantly associated with preterm birth, with a p-value of 0.002, indicating that H0 was rejected and Ha was accepted. Regarding the association between a history of preeclampsia and preterm birth, the analysis yielded a p-value of 0.519, meaning that H0 was accepted; thus, preeclampsia history was not associated with preterm

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delivery. In contrast, the association between a history of premature rupture of membranes (PROM) and preterm birth showed a p-value of <0.001, indicating a significant relationship. Similarly, a history of threatened preterm labor (TPL) was also found to be significantly associated with preterm delivery, with a p-value of <0.001. Variables with a p-value <0.25 in the bivariate analysis were subsequently included in the multivariate analysis. The results of the multivariate analysis of factors associated with preterm birth are presented in Table 4.

Multivariate analysis was conducted to identify the factors most strongly associated with the incidence of preterm birth at Buleleng District Hospital in 2024. Variables were included in this analysis if they met the criterion of having a p-value <0.25 in the bivariate analysis. The variables entered into the multivariate model were maternal age, employment status, parity, history of premature rupture of membranes (PROM), and history of threatened preterm labor (TPL). Multiple logistic regression was performed using the Backward Stepwise (Likelihood Ratio) method with five steps. The final results of the analysis are presented in Table 4.

Table 4.
The Factors Most Strongly Associated with The Incidence of Preterm Birth at Buleleng District Hospital in 2024

Independent	*Sig.*	*AOR*	*95% CI*
Maternal Age	< 0.001*	6.565	3.119-13.817
History of PROM	0.001*	6.207	2.123 – 18.148
History of TPL	< 0.001*	4.150	2.137 – 8.059

*AOR: Adjusted Odds Ratio, CI: confidence interval, * (p-Value <0.05)*

Based on the results presented in the table above, maternal age was found to have a p-value <0.001, history of premature rupture of membranes (PROM) had a p-value of 0.001, and history of threatened preterm labor (TPL) had a p-value <0.001. These findings indicate that the risk factors jointly associated with the incidence of preterm birth were maternal age, history of PROM, and history of TPL. Among these, maternal age emerged as the most significant factor, with an adjusted odds ratio (AOR) of 6.565.

The analysis results indicated a significant association between maternal age and the incidence of preterm birth (p < 0.001). This suggests that maternal age is a key factor contributing to the likelihood of delivery before term. Pregnant women in the age groups <20 years or >35 years are considered high-risk due to their vulnerability to various pregnancy complications, including preterm birth. Physiologically, very young mothers often exhibit incomplete reproductive organ development and suboptimal nutritional status, whereas older mothers face increased risks of vascular disorders and comorbidities such as hypertension or diabetes, which may lead to medically indicated early delivery.(12) Ratnaningtyas and Indrawati (2023) support these findings, noting a significant increase in preterm incidence among extreme age groups due to higher risks of placental disorders, cervical insufficiency, and pregnancy-related stress.[8] These results underscore the importance of targeted antenatal care programs for high-risk age groups, particularly within the catchment area of RSUD Buleleng.

The multivariate analysis yielded an Adjusted Odds Ratio (AOR) of 6.565 with a 95% Confidence Interval (CI) of 3.119–13.817. An OR greater than 1 indicates a positive association, meaning that mothers in the high-risk age category (<20 or >35 years) were 6.5 times more likely to deliver preterm infants compared to mothers within the safe age range (20–35 years). The confidence interval not crossing 1 (3.119–13.817) further confirms the statistical significance of this result. This finding aligns with previous studies emphasizing that both very young (<20 years) and advanced maternal age (>35 years) are strongly associated with uterine dysfunction, hormonal imbalances, and

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increased pregnancy complications such as preeclampsia, infection, and placental disorders.(13–15) Among adolescents, biological immaturity and emotional instability often exacerbate risks, whereas older mothers face increased vascular degeneration and potential comorbidities. Social and psychological factors also play a role; young mothers may encounter limited access to information, economic dependency, and social pressure, affecting prenatal care adherence. Conversely, older mothers frequently face high-risk pregnancies requiring medical interventions, such as induction or cesarean delivery, which may precipitate preterm birth.(16)

The results also indicated that maternal education was not significantly associated with preterm birth ($p = 0.473$). Nearly all respondents in this study had only primary education (97.8%), resulting in very limited variability in this category. With such narrow variation, it is difficult to determine whether education level contributes meaningfully to preterm risk. Nevertheless, theoretically, low education may affect a mother's ability to understand health information, comply with antenatal care visits, take supplements, and recognize warning signs during pregnancy.(17) Studies such as Setyaningsih et al. (2025) indicate that higher education levels correlate with better pregnancy outcomes due to greater understanding of medical information and adoption of healthy behaviors.(18) Although this study did not find statistical significance, it remains crucial for health facilities to provide comprehensive education for all pregnant women, particularly those with limited formal schooling.

A significant association was observed between maternal employment status and preterm birth ($p = 0.007$), with non-working mothers more commonly represented in the preterm group. Lack of formal employment may indicate financial dependency, limited access to health information and services, and reduced control over a supportive environment for a healthy pregnancy. Although few studies specifically examine maternal employment and preterm birth, Sari, Subadiyasa, and Riani (2021) reported that socioeconomic factors substantially influence preterm risk.(13) Mothers with lower socioeconomic status often experience psychological stress, inadequate nutrition, and barriers to accessing quality healthcare. Economic dependence can restrict transportation to health facilities, purchasing prenatal supplements, and timely management of obstetric emergencies. Since employment is closely linked to economic status and access to resources, these findings highlight the need for enhanced social support and protection for pregnant women who are unemployed or economically disadvantaged.

The multivariate analysis confirmed that maternal age is the dominant risk factor contributing to preterm birth. The elevated risk is likely related to physiological, psychological, and socioeconomic limitations within this age group. In young mothers, reproductive organs and hormonal systems are not fully developed, reducing optimal fetal growth support. In older mothers, declining placental function, metabolic disorders, and higher prevalence of comorbidities such as hypertension and gestational diabetes contribute to intrauterine growth restriction (IUGR) and preterm birth.

The predominance of maternal age as the primary risk factor may also reflect gaps in reproductive health services, particularly regarding pre-marital education, preconception counseling, and age-based pregnancy risk monitoring. For example, in younger mothers, pregnancies often occur under socially and economically unprepared conditions, delaying antenatal care utilization or limiting optimal nutritional intake. Conversely, pregnancies in older mothers may occur with a background of infertility or other high-risk conditions, yet detection and intervention may not be optimal. Given that maternal age emerges as the main determinant of preterm birth, preventive strategies should focus on strengthening reproductive health education among adolescents, promoting awareness of the ideal maternal age for pregnancy, and enhancing age-based risk screening during antenatal care. Primary health services should proactively identify age-related risk factors early in pregnancy through strengthened community health workers, home visits, and continuous support throughout the antenatal period. Age-targeted interventions are expected to reduce disparities in care and increase the likelihood of term delivery, particularly within the RSUD Buleleng catchment area and similar settings.

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The results of this study indicate that among the four obstetric factors examined parity, history of preeclampsia, premature rupture of membranes (PROM), and threatened preterm labor (TPL) three factors were found to have a statistically significant association with preterm birth, namely parity ($p = 0.002$), PROM ($p < 0.001$), and TPL ($p < 0.001$). Conversely, preeclampsia did not show a significant association ($p = 0.519$). The analysis further suggests that parity is significantly associated with preterm birth, indicating that maternal parity can influence the physiological readiness of the uterus and cervix to maintain pregnancy until term. Extreme parity, whether primiparity (first birth) or high multiparity (≥5 births), has long been linked to impaired uterine adaptation, cervical weakness, and placental vascularization disorders, all of which contribute to preterm birth.(19) In this study, the majority of mothers had high-risk parity (92.3%), and statistically, a significant relationship was found between parity and preterm delivery. This is due to the small proportion of mothers with extreme parity, who demonstrated a higher incidence of preterm birth. Vionada, Mahayani, and Apriliana (2024) similarly reported that high parity is associated with increased risk of uterine dysfunction, antepartum hemorrhage, and fetal growth disturbances, which can lead to medically indicated preterm delivery.(20) In primiparas, inadequate uterine adaptation and lack of awareness of warning signs also contribute to the elevated risk of preterm birth.

The history of PROM showed a very significant association with preterm birth ($p < 0.001$), with an adjusted odds ratio (AOR) of 6.207 and a 95% confidence interval of 2.123–18.148. This OR indicates that mothers with a history of PROM are approximately 6.2 times more likely to experience preterm birth compared to mothers without such a history. PROM is a critical factor in preterm birth because early rupture of membranes disrupts the sterile intrauterine environment. The premature loss of amniotic fluid reduces intrauterine pressure, triggers uterine contractions, and increases the risk of intrapartum infections such as chorioamnionitis, which accelerates the labor process.[21] Norazizah and Rahmawati (2024) found that around 30–40% of preterm births are caused by PROM, with the risk particularly elevated when it occurs before 34 weeks of gestation.(22) Additional research by Saputra, Sudiarta, and Hediyantini (2023) highlighted that PROM often represents the endpoint of chronic intrauterine inflammation, including undetected latent infections.(23) These findings reinforce that PROM is not merely a mechanical issue but also reflects compromised membrane integrity due to subclinical infection or inflammation.

The history of threatened preterm labor (TPL) in this study showed a highly significant association with preterm birth ($p < 0.001$). Multivariate analysis revealed an AOR of 4.150, with a 95% confidence interval ranging from 2.137 to 8.059. This indicates that mothers with a history of TPL are approximately four times more likely to deliver preterm compared to those without such a history. In other words, TPL represents the strongest clinical risk factor for preterm birth in this study when compared to other factors such as maternal age or PROM.

TPL is defined as the presence of strong and regular uterine contractions before 37 weeks of gestation, accompanied by cervical changes (shortening or dilation), but without membrane rupture. This phase represents the early stage of true preterm labor, which, if not successfully managed, often results in preterm delivery.[11] Clinically, TPL poses a major challenge for healthcare providers, as even with tocolytic therapy and hospitalization, not all cases can be prevented from progressing to preterm birth.(24) Predisposing conditions such as intrauterine infection, subclinical inflammation, uterine overdistension due to polyhydramnios or multiple gestations, and cervical incompetence further complicate management. A prior history of preterm birth also increases the likelihood of recurrent TPL in subsequent pregnancies.

Zahroh et al. (2022) reported that over 80% of TPL cases result in preterm birth, particularly when early detection and aggressive management are lacking.(25) TPL is strongly correlated with neonatal complications, including respiratory distress syndrome (RDS), intraventricular hemorrhage, neonatal infections, and hypoxic-ischemic encephalopathy, due to incomplete organ maturation at birth.

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This elevates perinatal morbidity and mortality and has long-term consequences on child development. Daskalakis et al. (2023) also emphasized that TPL represents one of the most difficult forms of preterm birth to control, as medical interventions are largely supportive.(26) Therefore, primary prevention through early identification of TPL risk factors such as prior preterm birth, recurrent urinary tract infections, or uterine abnormalities is critical for managing high-risk pregnancies.

In the RSUD Buleleng region, data indicate that TPL as a risk factor may be linked to inadequate early detection during antenatal care (ANC) at primary or secondary health facilities. Contributing factors include limited access to cervical ultrasonography and suboptimal monitoring of uterine contractions and manual cervical assessments. Given that TPL is the strongest risk factor in this study, preterm birth prevention strategies should focus on enhancing pregnant women's education regarding early signs of preterm labor, training healthcare providers in early TPL management, and optimizing referral systems from primary health centers to hospitals before labor progresses. Interventions such as vaginal progesterone administration in mothers with a history of preterm birth or short cervix, and cerclage placement in cases of cervical incompetence, have proven effective in preventing TPL recurrence. Thus, TPL serves not only as a clinical risk factor but also as an indicator of weaknesses in early detection and maternal healthcare response systems. Proper and comprehensive management of TPL is expected to significantly reduce preterm birth incidence and neonatal complications at RSUD Buleleng and similar settings.

CONCLUSION

There was a significant association between maternal age, employment status, parity, history of premature rupture of membranes, and history of TPL with preterm delivery, with maternal age being the most dominant risk factor. In contrast, education level and history of preeclampsia were not significantly associated. These findings highlight the need for healthcare providers and institutions to strengthen early detection and management of key risk factors, supported by accurate medical records and appropriate referral systems. Future research should adopt prospective designs and include broader variables to deepen the understanding of preterm birth determinants.

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