

Analysis of High Risk Factors Among Referred Pregnant Women at Sultan Iskandar Hospital

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ABSTRACT

High-risk pregnancy is a condition that can increase the occurrence of complications in both the mother and the fetus, thus requiring appropriate management and referral. Factors such as maternal age, parity, obstetric history, and health conditions during pregnancy contribute to the increased risk of pregnancy complications.

Objective: This study aims to analyze high-risk factors in pregnant women referred to RSUD Sultan Iskandar Muda, Kuala Subdistrict, Nagan Raya Regency, Aceh Province in 2025

Methods: This study used a quantitative method with a case-control analytic design. The study population consisted of all pregnant women referred to RSUD Sultan Iskandar Muda, with a sample of 72 respondents selected using purposive sampling technique. Data were obtained from medical records and analyzed using the Chi-Square test with a significance level of 0.05 and Odds Ratio (OR) to determine the magnitude of risk.

Results: The results showed that most respondents were in the age group of <20 years and >35 years (54.2%), primigravida and grandemultipara (55.6%), had a history of obstetric complications (55.6%), and had hemoglobin levels >11 g/dl (73.6%). Bivariate analysis showed a significant relationship between maternal age and high-risk pregnancy ($p=0.005$; $OR=4.600$), parity $p=0.009$; $OR=4.086$), obstetric history ($p=0.009$), and hemoglobin levels ($p=0.000$; $OR=3.118$) with the occurrence of high-risk pregnancy in pregnant women.

Conclusion: Maternal age, parity, obstetric history, and hemoglobin levels are factors associated with high-risk pregnancy among women referred to RSUD Sultan Iskandar Muda, Kuala Subdistrict, Nagan Raya Regency, Aceh Province in 2025. Improving the quality of antenatal care (ANC) services and early detection of risk factors are essential to reduce maternal complications and mortality.

Keywords: High-risk pregnancy, maternal age parity, obstetric history, hemoglobin pregnancy referral.

INTRODUCTION

High-risk pregnancy remains a major contributor to maternal and perinatal morbidity and mortality worldwide. It occurs when maternal, fetal, or obstetric conditions increase the risk of adverse outcomes during pregnancy, childbirth, or the postpartum period. Important risk factors include maternal age below 20 or above 35, high parity, previous obstetric complications, anemia, hypertension, diabetes, and inadequate antenatal care. Early identification and timely referral are essential for preventing maternal and neonatal complications. According to the World Health Organization, most maternal deaths occur in low- and middle-income countries, with hypertensive disorders, postpartum hemorrhage, infection, and unsafe abortion remaining leading causes. Indonesia continues to experience maternal mortality above the Sustainable Development Goals target, emphasizing the need for stronger maternal healthcare services and improved management of high-risk pregnancies. Previous studies have shown that maternal age, parity, adverse obstetric history, and medical conditions significantly increase pregnancy risks and referral needs. Women younger than 20 years or older than 35 years face higher risks of preeclampsia, preterm birth, postpartum hemorrhage, and low birth weight. Grand multiparity and previous unfavorable pregnancy outcomes further elevate maternal and fetal complications. RSUD Sultan Iskandar Muda serves as the primary referral hospital for maternal emergencies in Kuala District, Nagan Raya Regency, Aceh Province. It receives numerous referrals of pregnant women with complex conditions from primary healthcare facilities. Nevertheless, evidence regarding the most dominant risk factors among referred patients remains limited, restricting efforts to strengthen early screening and optimize referral systems. This study therefore analyzes factors associated with high-risk pregnancy among women referred during 2025. The findings are expected to support healthcare professionals and policymakers in designing evidence-based interventions, improving referral quality, reducing preventable maternal complications, enhancing neonatal outcomes, and strengthening comprehensive maternal healthcare services throughout the region effectively for all pregnant women and communities across Aceh Province through continuous collaborative efforts. Therefore, this study aimed to analyze the factors associated with high-risk pregnancy among women referred to RSUD Sultan Iskandar Muda, Kuala District, Nagan Raya Regency, Aceh Province, in 2025. The findings are expected to provide evidence for healthcare professionals and policymakers in developing effective strategies to reduce maternal complications and improve the quality of obstetric referral services.

METHODS

This study employed an analytic observational study using a case-control design to identify factors associated with high-risk pregnancy among pregnant women referred to Sultan Iskandar Muda Regional General Hospital (RSUD), Kuala District, Nagan Raya Regency, Aceh Province, Indonesia, in 2025. The study compared pregnant women classified as having high-risk pregnancies (case group) with pregnant women classified as not having high-risk pregnancies (control group).

The study population consisted of all pregnant women referred to Sultan Iskandar Muda Regional General Hospital during the study period. The sample comprised 72 respondents, consisting of 36 pregnant women in the high-risk pregnancy group and 36 pregnant women in the non-high-risk pregnancy group. The sample size was determined using the minimum sample size formula for an unmatched case-control study with a confidence level of 95% and statistical power of 80%. Respondents were selected using a purposive sampling technique based on predetermined inclusion and exclusion criteria. The inclusion criteria were pregnant women referred to Sultan Iskandar Muda Regional General Hospital with complete medical record data, while incomplete medical records were excluded from the study.

The dependent variable in this study was the incidence of high-risk pregnancy. The independent variables were maternal age, parity, obstetric history, and hemoglobin level.

Maternal age was categorized as high-risk (<20 years or >35 years) and non-high-risk (20–35 years). Parity was classified into primigravida and grand multipara versus multigravida. Obstetric history was categorized as having a previous history of obstetric complications or no previous history. Hemoglobin level was categorized as <11 g/dL and ≥ 11 g/dL according to World Health Organization (WHO) criteria for anemia during pregnancy.

Data were obtained from secondary sources, namely hospital medical records. The instruments used in this study were a structured data extraction sheet and medical record documents. The data extraction sheet was developed to record information on maternal age, parity, obstetric history, hemoglobin level, and pregnancy risk status. Data collection was conducted through medical record identification, data extraction, data verification, coding, and database entry using Microsoft Excel and Statistical Package for Social Sciences (SPSS) software.

Data analysis was performed in several stages. Univariate analysis was used to describe the characteristics of respondents and the distribution of research variables. Bivariate analysis was conducted using the Chi-Square test to assess the association between independent variables and high-risk pregnancy status with a significance level of $\alpha = 0.05$. The magnitude of risk was measured using Odds Ratio (OR) and 95% Confidence Intervals (CI). Logistic regression analysis was planned to identify the most dominant factors associated with high-risk pregnancy.

RESULTS AND DISCUSSIONS

This study was conducted at Sultan Iskandar Muda Regional General Hospital (RSUD), located in Kuala District, Nagan Raya Regency, Aceh Province, in 2025. The hospital is a district-level referral hospital that serves various obstetric and gynecological cases referred from community health centers (puskesmas) and primary health care facilities in the surrounding area. Nagan Raya Regency is one of the regions in Aceh Province that faces geographical challenges and limited health service access in several rural areas. Sultan Iskandar Muda Regional General Hospital serves as the main referral center for pregnant women with high-risk conditions, including cases such as preeclampsia, antepartum hemorrhage, severe anemia, pregnancy with comorbidities, high-risk pregnancy age (<20 years or >35 years), and extreme multipara.

Bivariate analysis was conducted to determine the relationship between independent variables, namely maternal age, parity, obstetric history, and hemoglobin level, and the dependent variable, namely high-risk pregnancy among pregnant women referred to Sultan Iskandar Muda Regional Hospital, Kuala District, Nagan Raya Regency, Aceh Province, in 2025. The analysis was performed using the Chi-Square test with a significance level of $\alpha = 0.05$. Variables with a p-value less than 0.05 were considered statistically significant.

Tabel 1 Analysis of Risk Factors of Age on the Incidence of Pregnancy Complications at Sultan Iskandar Muda Hospital, Kuala District, Nagan Raya Regency, Aceh Province, 2025

Age	Health Status				Total	OR 95% CI	P Value
	Risky		Not Risky				
	n	%	N	%			
<20 dan >35 tahun	26	72.2	13	36.1	39 (54.2%)	4.600 (1.697 – 12.469)	0.005
20 – 35 tahun	10	27.8	23	63.9	33 (45.8%)		
Total	36	100	36	100	100%		

Based on Table 1, respondents aged <20 years and >35 years were more frequently found in the high-risk group, accounting for 72.2%, compared with 36.1% in the non-high-risk group. The Chi-Square test showed a p-value of 0.005, indicating a statistically significant relationship

between maternal age and health status. The Odds Ratio (OR) value of 4.600 (95% CI: 1.697–12.469) indicates that pregnant women aged <20 years and >35 years were 4.6 times more likely to experience high-risk pregnancy compared to women aged 20–35 years.

Tabel 2 Analysis of the Influence of Parity Factors on High-Risk Events in Pregnant Women at Sultan Iskandar Muda Regional Hospital, Kuala District, Nagan Raya Regency, Aceh Province in 2025

Paritas	Health Status				Total	OR 95% CI	P Value
	Risky		Not Risky				
	N	%	N	%			
Primigravida And Grandemulti	26	72.2	14	38.9	40 (55.6%)	4.086 (1.518–11.000)	0.009
Multigravida	10	27.8	22	61.1	32 (44.4)		
Total	36	100	36	100	100%		

Based on Table 2, respondents who were primigravida or grandemultipara were more frequently found in the high-risk group (72.2%) compared to the non-high-risk group (38.9%). The Chi-Square test revealed a p-value of 0.009, indicating a significant relationship between parity and high-risk pregnancy. The Odds Ratio of 4.086 (95% CI: 1.518–11.000) suggests that women experiencing their first pregnancy or having more than five previous births were 4.086 times more likely to experience a high-risk pregnancy compared to multigravida women.

Based on Table 2, respondents who were primigravida or grandemultipara were more frequently found in the high-risk group (72.2%) compared to the non-high-risk group (38.9%). The Chi-Square test revealed a p-value of 0.009, indicating a significant relationship between parity and high-risk pregnancy. The Odds Ratio of 4.086 (95% CI: 1.518–11.000) suggests that women experiencing their first pregnancy or having more than five previous births were 4.086 times more likely to experience a high-risk pregnancy compared to multigravida women.

Tabel 3 Analysis of the Influence of Obstetric History Factors on High-Risk Events in Pregnant Women at Sultan Iskandar Muda Regional Hospital, Kuala District, Nagan Raya Regency, Aceh Province in 2025

Obstetric History	Health Status				Total	OR 95% CI	P Value
	Risky		Not Risky				
	n	%	N	%			
There is History	26	65.0	14	35.0	40 (55.6%)	314 (104 – 947)	0.009
No History	10	31.2	22	68.8	32 (44.4%)		
Total	36	100	36	100	72 (100%)		

Based on Table 3, respondents with a previous obstetric history were more likely to experience high-risk pregnancy (65.0%), whereas respondents without a previous obstetric history were predominantly found in the non-high-risk group (68.8%). The Chi-Square test yielded a p-value of 0.009, indicating a statistically significant relationship between obstetric history and high-risk pregnancy. The Odds Ratio analysis demonstrated that women with a previous obstetric history had a greater likelihood of experiencing high-risk pregnancy compared to women without such a history.

Table 4 Analysis of the Influence of Level Factors on High Risk Events in Pregnant Women at Sultan Iskandar Muda Regional Hospital, Kuala District, Nagan Raya District, Aceh Province in 2025

Kadar Haemoglobin	Health Status				Total	OR 95% CI	P Value
	Risky		Not Risky				
	n	%	N	%			
<11 gr/dl	19	52.8	0	0.0	19 (26.4)	3.118 (2.107 – 4.613)	0.000
>11 gr/dl	17	47.2	36	100	53 (73.6%)		
Total	36	100	36	100	72 (100%)		

Based on Table 4, respondents with hemoglobin levels below 11 g/dL were predominantly found in the high-risk group (52.8%), while all respondents in the non-high-risk group had hemoglobin levels above 11 g/dL. The Chi-Square test produced a p-value of 0.000, indicating a highly significant relationship between hemoglobin level and high-risk pregnancy. The Odds Ratio value of 3.118 (95% CI: 2.107–4.613) indicates that pregnant women with hemoglobin levels below 11 g/dL were 3.118 times more likely to experience high-risk pregnancy than those with hemoglobin levels above 11 g/dL.

CONCLUSIONS

This study aimed to analyze factors associated with high-risk pregnancy among pregnant women referred to Sultan Iskandar Muda Regional General Hospital, Kuala District, Nagan Raya Regency, Aceh Province, in 2025. The findings demonstrated that maternal age, parity, obstetric history, and hemoglobin level were significantly associated with the occurrence of high-risk pregnancy. Maternal age was identified as the most dominant risk factor, with

pregnant women aged below 20 years and above 35 years having a substantially higher likelihood of experiencing high-risk pregnancy. In addition, primigravida and grand multipara women were more likely to develop pregnancy complications than multigravida women. A previous history of obstetric complications also increased the risk of high-risk pregnancy, while hemoglobin levels below 11 g/dL were significantly associated with a greater probability of pregnancy complications. These findings indicate that early identification of maternal age, parity, obstetric history, and hemoglobin status during antenatal care is essential to prevent maternal and fetal complications. Strengthening screening programs and referral systems may contribute to improving maternal health outcomes and reducing maternal morbidity. Recommendations Healthcare providers should enhance routine antenatal screening, particularly for pregnant women with high-risk age categories, abnormal parity, adverse obstetric history, and anemia. Regular hemoglobin monitoring and appropriate iron supplementation should be strengthened as part of comprehensive maternal healthcare services. Hospital management and local health authorities should improve the quality of referral systems and maternal health education programs to ensure early detection and timely management of high-risk pregnancies. Future studies are recommended to include larger sample sizes and additional variables, such as educational level, socioeconomic status, nutritional status, antenatal care utilization, and maternal comorbidities, to provide a more comprehensive understanding of factors influencing high-risk pregnancy. Multicenter studies involving different healthcare facilities are also needed to improve the generalizability of the findings.

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AUTHOR CONTRIBUTIONS

All authors jointly contributed to the development of the research concept, determination of the methodology, data collection and analysis, interpretation of the research findings, preparation and revision of the manuscript, and have read and approved the final version of the

manuscript prior to publication. All authors are responsible for the content and integrity of this study.

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