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The effect of antenatal care examinations on early detection of high-risk pregnancy

Parningotan Simanjuntak*, Nopalina Suyanti Damanik, Sri Rezeki,
Debby Chintya Yun, Magdalena Barus, Desi Ulina Sipayung

Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: parningotan@mitrahusada.ac.id

Abstract

Background: A high-risk pregnancy is a pregnancy that can endanger the health of the mother and fetus due to complications, both pre-existing and emerging during pregnancy, such as hypertension, diabetes, preeclampsia, anemia, and infection. Antenatal care (ANC) examinations play a crucial role in early detection of high-risk pregnancies so that complications can be prevented or managed early.

Purpose: To analyze the effect of Antenatal Care examinations on early detection of high-risk pregnancies.

Method: This study used a quantitative design with an analytical survey approach. The study was conducted from February to June 2025 at Efarina Karo Hospital. The study population was all pregnant women undergoing ANC examinations, using a purposive sampling technique. Data were analyzed using the Chi-Square test with a 95% confidence level (p -value = 0.05).

Results: The results showed that the majority of respondents (30 respondents) underwent a complete ANC examination. Early detection of high-risk pregnancies was found in 27 respondents (60.0%). Pregnant women who underwent a complete ANC examination were more likely to have high-risk pregnancies detected, namely 22 respondents (73.3%). The chi-square test showed a p -value of 0.012 ($p < 0.05$).

Conclusion: There is a significant influence between antenatal care (ANC) examinations and the early detection of high-risk pregnancies. Comprehensive ANC examinations are crucial for improving early detection and preventing pregnancy complications.

Keywords: Ante Natal Care; Early Detection; High Risk; Pregnancy.

INTRODUCTION

Pregnancy is a crucial phase in a woman's life, requiring intensive medical attention to ensure the health of both mother and fetus (Othman, 2024). The pregnancy process can be faced with various high-risk conditions, both for the mother and fetus, which require regular medical monitoring. One of the most effective ways to monitor the health of pregnant women and their fetuses is through antenatal care (ANC) examinations (Hu, Hu, Zhao, Huang, Yang, & Di, 2021). This examination includes a series of medical procedures aimed at detecting problems that can arise during pregnancy, including high-risk pregnancies, such as preeclampsia, gestational diabetes, fetal growth disorders, and other

abnormalities that can threaten the safety of the mother and baby (Yilmaz & Oskay, 2021).

A high-risk pregnancy is defined as a condition in which the mother or fetus is at risk of complications that could endanger the lives of both (Shojaeian, Khadivzadeh, Sahebi, Kareshki, & Tara, 2021). These high-risk conditions can include pre-existing medical conditions such as hypertension, diabetes, or heart problems, as well as conditions that arise during pregnancy, such as preeclampsia, anemia, and infection. Early detection of high-risk conditions is crucial for reducing maternal and infant mortality. According to data from the World Health Organization with effective early detection, nearly 50% of

pregnancy complications can be avoided or better managed. Routine, high-quality ANC check-ups are vital for detecting health problems at an early stage and providing opportunities for faster medical intervention (World Health Organization, 2021).

High-risk pregnancies can cause serious complications for both the mother and the fetus. Therefore, early detection through antenatal care (ANC) is crucial to reducing maternal and infant mortality. According to WHO data (2021), early detection of high-risk pregnancies can reduce maternal mortality by up to 30% and newborn mortality by up to 50%. Therefore, ANC should be performed regularly from early pregnancy, including blood pressure checks, urine tests, blood tests to detect anemia and other disorders, and fetal growth monitoring using ultrasound. Despite ANC's crucial role, its implementation in some regions in Indonesia still faces various challenges (Poon, Magee, Verlohren, Shennan, von Dadelszen, Sheiner, & Hod, 2021).

ANC examinations include several important tests, such as blood pressure measurements, urine tests to detect protein or infection, blood tests to evaluate nutritional status and anemia, and fetal growth monitoring through ultrasound (USG). Pregnant women's knowledge of the importance of ANC examinations and adherence to routine examination recommendations play a crucial role in the effectiveness of early detection (Tanberika, Sansuwito, Bin, & Hassan, 2024). In Indonesia, despite the relatively high number of ANC visits, significant challenges remain in terms of service quality and timeliness of high-risk detection, particularly in areas with limited access to quality health facilities (Mahmood, Hendarto, Laksana, Damayanti, Suhargono, Pranadyan, & Mufidah, 2021).

Furthermore, social and cultural factors often influence pregnant women's decisions to undergo regular ANC checkups. In some regions, there is still a perception that pregnancy is a normal condition and does not require intensive medical attention, which leads to low motivation to visit health facilities (Mutia & Hadi, 2023). The limited availability of trained medical personnel, particularly in rural areas or areas with difficult transportation access, also hinders optimal ANC implementation.

In Indonesia, the prevalence of pregnant women who do not receive regular ANC care is quite high. Based on 2018 Riskesdas data, approximately 17.5% of pregnant women in Indonesia did not receive ANC care in the first trimester (Angrella & Ariane, 2025). ANC coverage has reached 90%, the quality of care services still needs to be improved, particularly in the early detection of high-risk pregnancies. Limited access to health facilities in some areas, as well as sociocultural factors that influence mothers' attitudes towards the importance of ANC care, are major obstacles to effective ANC implementation (Resubun, 2022).

In North Sumatra Province, including Karo Regency, despite relatively high ANC coverage, various challenges remain regarding the completeness and quality of services. A study at the Sei Mencirim Community Health Center in Deli Serdang showed that ANC implementation was suboptimal, as evidenced by the low target attendance rate and the lack of cooperation among pregnant women with primary education and housewives in completing questionnaires, reflecting limited knowledge about ANC (Handayani & Idris, 2022). In other areas of North Sumatra, such as Lubuk Pakam, approximately 78.3% of pregnant women had ANC visits, but only 58.3% received complete services according to the 10T standards, with laboratory tests and references still below national standards (Haryono, Wiyana, & Meha, 2025).

Efarina Etaham Berastagi Hospital, as one of the main hospitals in Karo Regency, plays a crucial role in providing ANC services for pregnant women. The hospital has adequate facilities and medical personnel to conduct comprehensive ANC examinations. However, based on internal data, the early detection rate for high-risk pregnancies could still be improved. The hospital's annual report indicates that only about 60% of pregnant women who come for ANC examinations are diagnosed as high-risk early. This indicates that even though ANC examinations are performed, their effectiveness in detecting high-risk pregnancies still needs to be evaluated and improved (Erina Karo Hospital, 2024).

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Mitra Husada Medan College of Health Sciences

Corresponding author: *Email: parningotan@mitrahusada.ac.id

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Some of the issues faced at Efarina Etaham Hospital in Berastagi include a lack of consistency in follow-up monitoring for high-risk pregnancies and limited education regarding the importance of regular and timely ANC check-ups. Furthermore, most pregnant women in Karo Regency prefer to use the services of midwives or other health workers who are not always directly connected to hospital facilities, hindering communication regarding early detection and follow-up of high-risk pregnancies.

This research is crucial to provide a deeper understanding of the extent to which ANC screenings at Efarina Etaham Hospital in Berastagi are capable of detecting high-risk pregnancies and how the quality of these services can be improved. Furthermore, the results are expected to serve as evaluation material for improving the quality of ANC services at the hospital and provide recommendations to the local government and relevant parties to improve access to and quality of maternal health services in Karo Regency.

This research is expected to provide more effective solutions for improving early detection of high-risk pregnancies, ultimately reducing complications and maternal and infant mortality. Successful early detection relies not only on medical examinations but also on health education for

pregnant women, encouraging them to become more aware of the importance of regular antenatal care (ANC) checkups.

RESEARCH METHOD

This study uses a quantitative approach with an analytical survey approach. It will be conducted at Efarina Karo Hospital, located at Jalan Jamin Ginting No. 1, Raya Village, Berastagi District, Karo Regency, North Sumatra Province, from February to June 2025.

Population and Sample: The population in this study is all pregnant women who received antenatal care (ANC) checks at Efarina Karo Hospital in 2025. The sampling technique used purposive sampling with specific inclusion criteria (selecting pregnant women with characteristics or conditions that align with the research focus, namely ANC checks and early detection of high-risk pregnancies).

Questionnaire: Part one: Questions regarding the frequency, quality, and completeness of ANC checks. Part two: Data regarding early detection of high-risk pregnancies, including identification of risk factors identified during ANC checks. Bivariate analysis used the Chi-Square statistical test with a 95% confidence level ($p\text{-value} = 0.05$) to determine whether there is a significant relationship between the variables.

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Mitra Husada Medan College of Health Sciences
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RESEARCH RESULTS

Tabel 1. Characteristics of Respondents (N=35)

Variable	Results	P-Value
Age (Mean±SD) (Range) (Years)	(28.61± 7.76) (18-45)	
< 20	6/13.3	
20–35	29/64.4	
> 35	10/22.2	
Education (n/%)		
Primary	14/31.1	
Secondary	21/46.7	
Higher	10/22.2	
Parity (n/%)		
Primigravida	17/37.8	
Multigravida	28/62.2	
ANC Examination (n/%)		0.012
Complete	30/66.7	
Incomplete	15/33.3	
Early Detection of High Risk (n/%)		
Detected	27/60.0	
Not Detected	18/40.0	

Based on Table the majority of respondents were of healthy reproductive age (20-35 years), namely 29 respondents (64.4%). The majority of respondents were multigravida (28 respondents (62.2%). Most respondents had completed a complete ANC examination, namely 30 respondents (66.7%). 27 respondents (60.0%) had high-risk pregnancies detected early. The results of the analysis using the Chi-Square test obtained a p value = 0.012 ($p < 0.05$), which shows that there is a significant influence between Antenatal Care examinations on early detection of high-risk pregnancies.

DISCUSSION

This study aims to determine the effect of Antenatal Care (ANC) examinations on early detection of high-risk pregnancies in pregnant women who check themselves at Efarina Etaham Berastagi Hospital in 2025. Based on the results of data analysis from 45 respondents, it was found that there was a significant relationship between the intensity of ANC examinations and the success of early detection of high-risk pregnancies.

The statistical test results (T-test) showed a p-value of $0.001 < 0.05$, indicating a significant

difference between the frequency of ANC check-ups and the ability to detect high-risk pregnancies. This confirms the finding that pregnant women who undergo complete and regular ANC have a greater chance of early detection of a high-risk pregnancy.

Similarly, previous research showed that the implementation of the Social Security Administration's online registration application increased pregnant women's access to ANC services at the Sei Bejangkar Community Health Center in Batubara,

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with 85% of respondents aged 20–35 years old being highly enthusiastic. This suggests that access and ease of service also support ANC compliance (Simanjuntak & Damanik, 2023).

A study other highlighted that pregnant women's knowledge and attitudes significantly influence the frequency of ANC visits, with a p -value < 0.05 (Rahayu, 2023). This means that mothers with better health literacy are more likely to adhere to ANC, which influences early risk detection.

The study results showed that the majority of pregnant women had undergone a complete ANC examination. A comprehensive ANC examination provides healthcare workers with the opportunity to comprehensively monitor the condition of the mother and fetus, including identifying pregnancy risk factors. ANC is a crucial component of maternal health care, aiming to detect pregnancy complications early (Tahir & Anjarwati, 2025).

This research is also supported by a previous study conducted, which found that ANC examinations at least four times during pregnancy were closely associated with increased detection of high-risk conditions such as hypertension, preeclampsia, and intrauterine growth restriction (IUGR) (Tousty, Fraszczyk-Tousty, Golar, Zahorowska, Sławiński, Dzidek, & Kwiatkowski, 2023).

This finding is in line with research by which analyzed the factors of low ANC visits at the Gunung Baringin Community Health Center (Simanjuntak & Damanik, 2023). Knowledge, education, and social support were the main determinants of ANC compliance ($p < 0.05$) (Tahir & Anjarwati, 2025). Other factors influencing pregnant women's compliance with ANC visits, according to research from Mitra Husada Medan College of Health Sciences, include educational status, age, knowledge, and family support. One of them found that knowledge, age, education, and occupation synergistically increased pregnant women's compliance with ANC visits (Samosir, Rambe, Sipayung, Manullang, & Wahyuni, 2024).

Early detection of high-risk pregnancies is crucial for reducing pregnancy and childbirth complications. Research shows that pregnant women who undergo comprehensive antenatal care (ANC) are more likely to experience early detection of high-risk pregnancies than those who do not. This demonstrates the significant role of ANC screening in identifying pregnancy problems early (Bagayoko, Kadengye, Otero, & Izudi, 2023).

Researchers assume that the more frequently and timely a pregnant woman attends ANC visits, the more health parameters can be checked, such as blood pressure, hemoglobin levels, uterine fundal height, and fetal heart rate. This assumption is based on the ANC service standards of the Indonesian Ministry of Health, which emphasize the importance of routine checkups (Abuku, Allotey, & Akonde, 2023).

In practice, pregnant women who attend a complete antenatal care visit (at least four times) will receive laboratory tests, nutrition education, TT immunization, and early detection of complications, which are crucial for preventive efforts. Therefore, this study underscores the importance of ongoing education about the benefits of antenatal care for expectant mothers (Bagayoko et al., 2023).

CONCLUSION

Based on the results of a study of 45 respondents, it can be concluded that the majority of pregnant women underwent complete Antenatal Care (ANC) examinations and experienced more early detection of high-risk pregnancies compared to pregnant women who did not complete ANC. The results of statistical analysis showed a significant effect between ANC examinations and early detection of high-risk pregnancies ($p = 0.012$), so that complete ANC examinations play an important role in preventing and managing pregnancy complications. Therefore, it is recommended that pregnant women be more active and routinely undergo ANC examinations according to standards, health workers improve health promotion and the quality of recording and follow-up of examination results, and health service institutions continue to improve the quality of ANC services by improving the competence of health workers, infrastructure, and an effective referral

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system. In addition, further research is expected to develop this study by adding other variables that influence ANC compliance and using a broader research design to obtain a more comprehensive picture.

REFERENCES

- Abuku, V. G., Allotey, E. A., & Akonde, M. (2023). Clinical and laboratory presentation of first-time antenatal care visits of pregnant women in Ghana, a hospital-based study. *Plos one*, 18(1), e0280031.
- Angrella, N., & Ariane, I. (2025). Status Kesehatan Mental Ibu Hamil pada Kegiatan Antenatal Care (ANC) di UPTD Puskesmas Manggar Balikpapan, September–Oktober 2023: Hasil Penelitian. *Cermin Dunia Kedokteran*, 52(6), 375-378.
- Bagayoko, M., Kadengye, D. T., Odero, H. O., & Izudi, J. (2023). Effect of high-risk versus low-risk pregnancy at the first antenatal care visit on the occurrence of complication during pregnancy and labour or delivery in Kenya: a double-robust estimation. *BMJ open*, 13(10), e072451.
- Erina Karo Hospital. (2024). Laporan Tahunan RS Efarina Karo: Kinerja Pelayanan Kesehatan Ibu Hamil.
- Handayani, P., & Idris, I. (2022). Mapping of Antenatal Care Visits for Pregnant Women on the risk of pregnancy and prevention of childbirth complications. *Sci. Midwifery*, 10(4), 3502-11.
- Haryono, N. E., Wiyana, V., & Meha, M. A. (2025). Coverage and Determinants of the Success of Antenatal Care (ANC) in First Trimester Pregnant Women at Lubuk Pakam Public Health Center. *JURNAL KEBIDANAN KESTRA* (JKK), 8(1), 121-131.
- Hu, W., Hu, H., Zhao, W., Huang, A., Yang, Q., & Di, J. (2021). Current status of antenatal care of pregnant women—8 provinces in China, 2018. *BMC Public Health*, 21(1), 1135.
- Mahmood, M. A., Hendarto, H., Laksana, M. A. C., Damayanti, H. E., Suhargono, M. H., Pranadyan, R., & Mufidah, I. (2021). Health system and quality of care factors contributing to maternal deaths in East Java, Indonesia. *PLoS One*, 16(2), e0247911.
- Mutia, F., & Hadi, A. J. (2023). Faktor yang Berpengaruh dengan Perilaku Pemeriksaan ANC Ibu Hamil di Wilayah Kerja Puskesmas Batangtoru Kabupaten Tapanuli Selatan. *Media Publikasi Promosi Kesehatan Indonesia (MPPKI)*, 6(9), 1887-1897.
- Othman, A. (2024). The effects of pregnancy and childbirth on women's health-related quality of life: A scoping review. *Evidence-Based Nursing Research*, 6(1), 39-52.
- Poon, L. C., Magee, L. A., Verlohren, S., Shennan, A., von Dadelszen, P., Sheiner, E., & Hod, M. (2021). A literature review and best practice advice for second and third trimester risk stratification, monitoring, and management of pre-eclampsia: Compiled by the Pregnancy and Non-Communicable Diseases Committee of FIGO (the International Federation of Gynecology and Obstetrics). *International Journal of Gynecology & Obstetrics*, 154, 3-31.
- Rahayu, I. (2023). Hubungan Pengetahuan Ibu Hamil Tentang Anc Terpadu Dengan Frekuensi Kunjungan ANC di Wilayah Kera Puskesmas Ciparay Kabupaten Bandung. *Jurnal Ilmiah Hospitality*, 11(2), 1573–1580.
- Resubun, T. F. (2022). Model Kolaborasi Satu Tungku Tiga Batu Pada Program Pencegahan dan Penanggulangan HIV AIDS di Kota Jayapura= Collaboration Model satu Tungku Tiga Batu in The HIV AIDS Prevention Program in Jayapura City (Doctoral dissertation, Universitas Hasanuddin).

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- Samosir, E., Rambe, R. S., Sipayung, I. D., Manullang, R., & Wahyuni, R. (2024). Hubungan Pengetahuan Dan Sikap Ibu Hamil Tentang Kunjungan Antenatal Care: Literatur Review. *Jurnal Ilmu Kesehatan & Kebidanan Nusantara*, 1(4), 143–154.
- Shojaeian, Z., Khadivzadeh, T., Sahebi, A., Kareshki, H., & Tara, F. (2021). Perceived Risk in Women with High Risk Pregnancy. *Iranian Journal of Nursing and Midwifery Research*, 26(2), 168–174.
- Simanjuntak, P., & Damanik, N. S. (2023). Pemanfaatan Aplikasi Pendaftaran Online BPJS Pada Pasien Ibu Hamil Rawat Jalan. *ALKHIDMAH: Jurnal Pengabdian Dan Kemitraan Masyarakat*, 1(3), 202–209.
- Tahir, D., & Anjarwati, N. (2025). Program Edukasi dan Pendampingan Kesehatan terhadap Perilaku Ibu Hamil dalam Melakukan Pemeriksaan Antenatal Care. *Mega Buana Journal of Innovation and Community Service*, 3(2), 66–74.
- Tanberika, F. S., Sansuwito, T. Bin, & Hassan, H. C. (2024). Knowledge in Enhancing Antenatal Care Compliance and Improving Maternal and Neonatal Health Outcomes. *Journal of Angiotherapy*, 8(12), 1–7.
- Tousty, P., Fraszczyk-Tousty, M., Golar, A., Zahorowska, A., Sławiński, M., Dzidek, S., & Kwiatkowski, S. (2023). Screening for preeclampsia and fetal growth restriction in the first trimester in women without chronic hypertension. *Journal of Clinical Medicine*, 12(17), 5582.
- World Health Organization. (2021). Global strategy for women's, children's and adolescents' health 2016–2030. Retrieved from: <https://www.who.int/docs/default-source/child-health/the-global-strategy-for-women-s-children-s-and-adolescents-health-2016-2030.pdf>
- Yilmaz, B., & Oskay, Ü. (2021). A Current View of Care of High-Risk Pregnancy. *Bezmialem Science*, 9(1), 112–119.

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