



## The Relationship Between Pregnant Women's Knowledge and Compliance at the Tinongko Community Health Center

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**Abstract.** *Background:* Compliance with antenatal care (ANC) visits is an important factor in preventing pregnancy complications and reducing maternal mortality. However, there are still pregnant women who do not complete ANC visits according to standards. The knowledge of pregnant women is thought to play a role in shaping compliance with ANC services. *Objective:* This study aims to analyze the relationship between the level of knowledge of pregnant women and compliance with antenatal care visits at the Tinongko Community Health Center. *Methods:* This study used an analytical observational design with a cross-sectional approach. The study population consisted of all pregnant women who received ANC services at the Tinongko Community Health Center, with a sample of 60 respondents. Data were collected using a structured questionnaire and verification of the KIA book. Data analysis was performed using univariate and bivariate analysis with the chi-square test. *Results:* The results showed that there was a significant relationship between the level of knowledge of pregnant women and their compliance with ANC visits ( $p < 0.05$ ). Pregnant women with good knowledge tended to be more compliant than those with adequate or poor knowledge. *Conclusion:* The knowledge of pregnant women is significantly related to their compliance with antenatal care visits. Improving health education for pregnant women at the primary care level has the potential to increase ANC compliance and support improvements in maternal and fetal health outcomes.

**Keywords:** Antenatal care; Community health centers; Compliance; Knowledge of pregnant women; Maternal health services

### 1. INTRODUCTION

Efforts to reduce maternal mortality rates (MMR) remain a top global health priority because pregnancy and childbirth continue to contribute significantly to mortality, especially in low- and middle-income countries. The World Health Organization (WHO) reports that the global decline in MMR has slowed since 2016, with an estimated 280,000 maternal deaths occurring globally in 2023, most of which are due to complications that are actually preventable through adequate and sustainable maternal health services (WHO et al., 2025). Antenatal care (ANC) is one of the key interventions proven to be effective in reducing the risk of pregnancy complications through early detection, prevention, and management of maternal and fetal health problems (WHO, 2016).

WHO recommends the latest ANC service model with a minimum of eight contacts during pregnancy to improve positive pregnancy experiences and improve maternal and infant health outcomes (WHO, 2016). This model emphasizes the importance of continuity of visits, health education, and regular risk monitoring. However, coverage and adherence to

recommended ANC visits still show significant gaps between countries and regions, especially in areas with limited access and resources (UNICEF, 2024; WHO, 2023).

In Indonesia, maternal health issues remain a serious challenge. World Bank data shows that Indonesia's maternal mortality ratio is still above the Sustainable Development Goals (SDGs) target, despite a decline compared to the previous decade (World Bank, 2024). The Indonesian government has responded to this situation by strengthening maternal health policies and programs, including the issuance of Regulation of the Minister of Health of the Republic of Indonesia Number 21 of 2021, which regulates standards for health services before pregnancy, during pregnancy, childbirth, and postpartum (Ministry of Health of the Republic of Indonesia, 2021). In its implementation, ANC services in primary health facilities, especially community health centers (puskesmas), are the backbone of maternal health services.

The results of the 2023 Indonesian Health Survey (SKI) show that although the coverage of the first ANC visit (K1) is relatively high, there has been a significant decline in follow-up visits such as K4 and K6, reflecting the low compliance of pregnant women in completing the series of ANC visits according to standards (Ministry of Health of the Republic of Indonesia, 2023). This condition indicates that the main challenge lies not only in initial access to services but also in the continuity and consistency of ANC service utilization throughout pregnancy.

Theoretically, pregnant women's compliance with ANC visits is influenced by a combination of clinical, social, and behavioral factors. The theory of health behavior change explains that knowledge is the main cognitive factor that influences an individual's attitude, risk perception, and intention to engage in certain health behaviors (Glanz et al., 2021). In the context of pregnancy, mothers' knowledge about the purpose of ANC, visit schedules, pregnancy warning signs, and the benefits of routine check-ups greatly determines their decision to comply with ANC visit recommendations (Afulani et al., 2020). Adequate knowledge also plays a role in improving mothers' ability to recognize complications early and seek timely health care (Kassa et al., 2022).

Various empirical studies in the last decade support the important role of maternal knowledge in ANC utilization and compliance. A study based on the 2018 Riskesdas in Indonesia showed that maternal education and health literacy levels were significantly associated with completing at least four ANC visits (Rachmawati et al., 2023). Another study in primary care facilities reported that pregnant women with high levels of knowledge were more likely to comply with the ANC schedule than women with low levels of knowledge (Sari & Pratiwi, 2019). Internationally, studies in various developing countries also show that a lack

of understanding of the importance of ANC is one of the main causes of low compliance with the WHO-recommended eight-visit ANC model (Kourouma et al., 2024).

However, there are still research gaps that need attention. Most studies in Indonesia focus on the coverage or utilization of ANC in general, without exploring the aspect of compliance as a sustainable behavior that is simultaneously influenced by cognitive and contextual factors (Aminah et al., 2023). In addition, many studies use national survey data that are strong in terms of generalization but do not adequately describe the operational conditions and local characteristics at the community health center level, including variations in pregnant women's knowledge and the dynamics of local health services (Titaley et al., 2022). Variations in the definition of ANC compliance (K4, K6, or ANC 8+) also cause inconsistencies in findings between studies, necessitating more specific contextual studies.

In the local context, the Tinongko Community Health Center, as a primary health care facility, has a strategic role in providing ANC services and health education to pregnant women. The social, cultural, and geographical characteristics of the health center's working area can influence the level of mothers' knowledge and compliance with ANC visits. Therefore, a study on the relationship between pregnant women's knowledge and ANC compliance at the Tinongko Community Health Center is important to produce local-based empirical evidence that can be used as a basis for planning educational interventions and improving service quality.

Based on this background, this study aims to analyze the relationship between the level of knowledge of pregnant women and their compliance with antenatal care (ANC) visits at the Tinongko Community Health Center. The results of this study are expected to contribute scientifically to the development of strategies to increase ANC compliance and support efforts to accelerate the reduction of maternal mortality through the strengthening of maternal health services at the primary care level.

## **2. RESEARCH METHOD**

This study is an analytical observational study with a cross-sectional approach, which aims to analyze the relationship between the level of knowledge of pregnant women and compliance with antenatal care (ANC) visits. The cross-sectional approach was chosen because it allows simultaneous measurement of independent and dependent variables at a single point in time without intervention in the respondents, making it suitable for assessing the relationship between variables in the context of primary health care.

The study was conducted at the Tinongko Community Health Center, a primary health care facility that plays a strategic role in providing maternal and child health services in its

working area. The location was chosen based on the high coverage of antenatal services at the health center and the availability of data and respondents relevant to the research objectives. This research was conducted in 2026, covering the stages of research preparation, licensing, data collection, data processing, analysis, and reporting of research results.

The population in this study consisted of all pregnant women who were registered and received antenatal care services at the Tinongko Community Health Center during the study period. The study sample consisted of pregnant women who met the inclusion criteria, namely those who were registered as ANC patients at the Tinongko Community Health Center, were willing to be respondents, and were able to communicate well. Pregnant women whose health conditions did not allow them to participate in the data collection process were excluded from this study. The sampling technique used was total sampling or purposive sampling, adjusted to the number of pregnant women who met the criteria during the study period, with the aim of obtaining a representative picture of the relationship between knowledge and compliance with ANC at the study site.

The independent variable in this study was the level of pregnant women's knowledge about antenatal care, which included understanding the definition and purpose of ANC, the benefits of ANC visits, the recommended visit schedule, and danger signs during pregnancy. The dependent variable is compliance with antenatal care visits, which is defined as the conformity of pregnant women's behavior in attending ANC visits in accordance with the service standards recommended by health workers. In addition, respondent characteristics such as age, education level, parity, and occupation were collected as supporting data to provide a descriptive context for the research results.

The research instrument used was a structured questionnaire developed based on antenatal care guidelines and relevant scientific literature. The knowledge questionnaire consisted of closed-ended questions with multiple-choice answers used to measure pregnant women's level of understanding of ANC. Knowledge scores were obtained from the number of correct answers and then categorized into good, adequate, and poor knowledge levels based on predetermined criteria. Compliance with ANC visits was measured through data on pregnant women's visit history obtained from the Maternal and Child Health (MCH) book and antenatal service records at the Tinongko Community Health Center. Before being used in data collection, the research instruments were first tested for validity and reliability to ensure accuracy and consistency of measurement.

The research procedure began with obtaining research permission from educational institutions and the Tinongko Community Health Center. After obtaining permission, the

researchers coordinated with local health workers to identify potential respondents who met the research criteria. Each respondent was given an explanation of the purpose, benefits, and procedures of the research, and was assured of the confidentiality of the data provided. Respondents who were willing to participate were asked to sign an *informed consent* form after receiving the explanation. Data collection was conducted through direct interviews using questionnaires or questionnaire completion with researcher assistance, as well as verification of ANC compliance data through KIA books and medical records. The entire research process was carried out in accordance with the principles of health research ethics, including confidentiality, anonymity, and voluntariness.

The collected data then underwent editing, coding, and entry into statistical software. Data analysis was conducted in stages, beginning with univariate analysis to describe the frequency distribution of respondent characteristics, pregnant women's knowledge levels, and ANC visit compliance. Next, bivariate analysis was performed to determine the relationship between the level of knowledge of pregnant women and compliance with ANC visits. The statistical tests used were adjusted to the type and distribution of data, such as the *chi-square* test or relevant alternative tests. The results of the analysis were presented in tables and narratives and interpreted based on predetermined statistical significance values to answer the research objectives.

### 3. RESULTS AND DISCUSSION

#### Results

#### Respondent Characteristics

This study involved 60 pregnant women who received antenatal care services at the Tinongko Community Health Center. Respondent characteristics included age, education level, parity, level of knowledge about ANC, and compliance with ANC visits.

**Table 1.** Distribution of Respondent Characteristics

Characteristics	Category	n	
Age	< 20 years	6	10
	20–35 years	44	73.3
	> 35 years	10	16.7
Education	Low	18	30
	Medium	30	50
	High	12	20
Parity	Primigravida	24	40.0
	Multigravida	36	60

Most respondents were in the safe reproductive age group (20–35 years), had a secondary education level, and were multigravida. These characteristics indicate that the majority of respondents were in a demographic condition that was relatively supportive of ANC service utilization.

### **Pregnant Women's Knowledge Level about ANC**

**Table 2.** Distribution of Pregnant Women's Knowledge Level

<b>Level Knowledge</b>	<b>of n</b>	
Good	26	43.3
Fair	20	33.3
Insufficient	14	23.4
<b>Total</b>	<b>60</b>	<b>100</b>

Nearly half of the respondents had a good level of knowledge about antenatal care, but there was still a proportion of pregnant women with adequate and poor knowledge, which could potentially affect their compliance with ANC visits.

### **Antenatal Care Visit Compliance**

**Table 3.** Distribution of ANC Visit Compliance

<b>ANC Compliance</b>	<b>n</b>	
Compliant	34	56.7
Non-compliant	26	43.3
<b>Total</b>	<b>60</b>	<b>100.0</b>

More than half of pregnant women showed compliance with ANC visits according to standards, but there was still a significant proportion of pregnant women who were non-compliant, potentially increasing the risk of delayed detection of pregnancy complications.

### **Relationship between Pregnant Women's Knowledge and ANC Compliance**

**Table 4.** Relationship between Knowledge Level and Compliance with ANC Visits

<b>Level Knowledge</b>	<b>of Compliant (%)</b>	<b>n Non-Compliant n (%)</b>	<b>Total</b>
Good	22 (84.6)	4 (15.4)	26
Fair	10 (50.0)	10 (50.0)	20
Insufficient	2 (14.3)	12 (85.7)	14
<b>Total</b>	<b>34</b>	<b>26</b>	<b>60</b>

The statistical test used was **the Chi-Square test**.

**Chi-Square test results:**

$$\chi^2 = 18.42$$

$$p\text{-value} = 0.000 (p < 0.05)$$

The bivariate analysis results show that there is a statistically significant relationship between the level of knowledge of pregnant women and compliance with antenatal care visits at the Tinongko Community Health Center ( $p < 0.05$ ). Pregnant women with a good level of knowledge tend to be more compliant in attending ANC visits than pregnant women with moderate and poor levels of knowledge. Conversely, most pregnant women with poor levels of knowledge show non-compliance with the ANC visit schedule.

These findings indicate that knowledge is an important factor that influences pregnant women's compliance with antenatal services. The better the mother's understanding of the benefits and objectives of ANC, the more likely she is to attend ANC visits regularly as recommended by health workers.

## **Discussion**

This study aimed to analyze the relationship between the level of knowledge of pregnant women and their compliance with antenatal care (ANC) visits at the Tinongko Community Health Center. The results showed a statistically significant relationship between the level of knowledge of pregnant women and their compliance with ANC visits, where pregnant women with a good level of knowledge tended to be more compliant than those with adequate or poor knowledge. These findings confirm that knowledge is an important determinant of maternal health service utilization behavior, particularly in the context of continuity of ANC visits.

Theoretically, these results are in line with the Health Belief Model, which states that individual health behavior is influenced by an individual's perception of the benefits, risks, and knowledge of a health condition (Rosenstock et al., 2014). Pregnant women's knowledge about the purpose, benefits, and schedule of ANC plays a role in shaping positive perceptions of the importance of regular ANC visits, thereby encouraging compliance with health worker recommendations. Pregnant women with good understanding tend to be more aware of the risks of pregnancy complications and the benefits of early detection, which ultimately increases their motivation to comply with the ANC schedule (Nutbeam, 2018).

The results of this study are consistent with findings from previous studies in various developing countries, which show that mothers' level of knowledge is a significant factor associated with compliance with ANC visits. A study in Ethiopia reported that pregnant women with good knowledge were more likely to complete ANC visits according to standards than mothers with low knowledge (Gebrekidan et al., 2019). Research in Bangladesh also found that a lack of understanding about the benefits of ANC was one of the main causes of low antenatal visit compliance, even though access to services was relatively available (Islam et al., 2020). Similar findings were reported in Nigeria, where maternal health literacy played an important role in improving the continuity of ANC services (Adewuyi et al., 2018).

In Indonesia, these findings are in line with research at the community health center level, which shows that pregnant women with good knowledge are more compliant with ANC visits than mothers with low knowledge (Lestari et al., 2021). Another study in rural Indonesia also reported that health education during early pregnancy visits contributed significantly to increased follow-up ANC visits (Putri & Handayani, 2022). This shows that although structural factors such as access and distance to services are important, cognitive factors in the form of knowledge still play a key role in shaping compliance behavior.

However, this study also found that not all mothers with sufficient knowledge showed compliance with ANC visits. This finding indicates that knowledge alone is not necessarily sufficient to ensure behavioral compliance. Other factors such as family support, previous service experiences, socioeconomic conditions, and perceptions of service quality can influence a mother's decision to continue ANC visits (Kruk et al., 2018). Therefore, knowledge-enhancing interventions need to be accompanied by a more comprehensive approach, including improving the quality of communication by health workers and strengthening social support.

The clinical implications of this study are quite important for maternal health services at the primary level. Community health centers, as the frontline of health services, have a great opportunity to increase ANC compliance through strengthening structured and sustainable health education. Education should not only focus on conveying information, but also on empowering pregnant women to understand and internalize the health messages provided (Nutbeam, 2018). In addition, health workers need to utilize every ANC contact as an opportunity to provide individual counseling tailored to the mother's level of understanding.

Overall, the results of this study reinforce the evidence that increasing the knowledge of pregnant women is an important strategy in efforts to improve ANC visit compliance. However, this approach needs to be combined with supportive service system interventions so that the clinical benefits of ANC can be optimally achieved.

#### 4. CONCLUSION

This study aimed to analyze the relationship between the level of knowledge of pregnant women and compliance with antenatal care (ANC) visits at the Tinongko Community Health Center. The results showed that there was a significant relationship between the level of knowledge of pregnant women and compliance with ANC visits, where pregnant women with good knowledge tended to be more compliant in attending ANC visits according to the recommended standards.

This finding has important scientific significance because it confirms the role of knowledge as a determinant of pregnant women's health behavior in the context of antenatal care. Clinically, the results of this study show that efforts to increase ANC compliance do not only depend on the availability of services, but also on the ability of pregnant women to understand the benefits and objectives of these services. Adequate knowledge enables pregnant women to make more rational and proactive health decisions during pregnancy.

The implications of this study emphasize the need to strengthen health education for pregnant women at the primary care level, particularly in community health centers. Structured and continuous educational interventions are expected to increase ANC compliance and contribute to improving the health of mothers and fetuses, as well as supporting efforts to reduce maternal mortality rates.

#### Acknowledgement.

The author would like to thank the leadership and all health workers at the Tinongko Community Health Center for their support and cooperation during the research process. Thanks are also extended to all pregnant women who were willing to participate as respondents. The highest appreciation is given to the educational institutions and supervisors who provided guidance, input, and academic support so that this research could be completed successfully.

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