

Analysis of Maternal Characteristics, Knowledge, and Attitude Factors Associated with the Coverage of K6 Antenatal Visits at Parung Panjang Health Center

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Abstract.

Background: Antenatal care (ANC) is a critical component of maternal health services aimed at improving maternal outcomes and reducing the risk of pregnancy-related complications. The Indonesian government has established a minimum standard of six antenatal visits (K6) to ensure optimal monitoring of pregnancy. However, the coverage of K6 visits at the primary healthcare level has not fully met the expected targets. Maternal characteristics, including demographic and behavioral factors, are considered important determinants influencing adherence to antenatal visits. Objective: This study aimed to analyze maternal characteristics, knowledge, and attitudes, as well as their association with the coverage of K6 antenatal visits in the working area of Parung Panjang Health Center in 2025. Methods: This study employed a quantitative analytic design with a cross-sectional approach. The sample consisted of 154 pregnant women selected using a total sampling technique. The dependent variable was K6 antenatal visit coverage (complete vs. incomplete). Independent variables included maternal age, educational level, employment status, parity, level of knowledge, and attitudes toward antenatal care. Data were collected using a structured questionnaire and verified through antenatal visit records in the Maternal and Child Health (MCH) handbook. Data analysis was conducted using univariate analysis to describe respondent characteristics, bivariate analysis with chi-square tests, and multivariate analysis using multiple logistic regression with a significance level of 5%. Results: More than half of the respondents (53.9%) had not completed the recommended K6 antenatal visits. Univariate analysis showed that the majority of mothers had low educational attainment and insufficient levels of knowledge and supportive attitudes toward antenatal care. Bivariate analysis revealed that maternal education, knowledge, and attitudes were significantly associated with K6 visit coverage ($p < 0.05$). Multivariate analysis indicated that maternal attitude was the most dominant factor associated with complete K6 visits after controlling for other maternal characteristics. Conclusion: The coverage of K6 antenatal visits in the study area remains low and is influenced by maternal characteristics, particularly education, knowledge, and attitude. Maternal attitude is the dominant factor associated with the completeness of K6 antenatal visits. Strengthening health education and fostering positive attitudes toward antenatal care services need to be enhanced to improve pregnant women's adherence to antenatal visits.

Keywords: Antenatal care; K6 visits; maternal characteristics and pregnancy visits.

I. INTRODUCTION

Maternal health is a key indicator of public health development because it is closely associated with maternal mortality ratio (MMR) and infant mortality rate (IMR). Efforts to reduce maternal mortality remain a national priority in line with the Sustainable Development Goals (SDGs), which emphasize the importance of access to quality maternal health services [1]. One of the primary interventions to improve maternal health is antenatal care (ANC), defined as routine pregnancy examinations conducted to monitor the condition of the mother and fetus, detect complications early, and provide essential health education [2][3]. The Indonesian government has established a minimum standard of six antenatal visits during pregnancy (K6) as part of strengthening maternal health services [4]. These visits include scheduled examinations across each trimester to ensure that pregnancy progresses normally and that potential complications are identified at an early stage [5][6]. Scientific evidence indicates that adherence to complete ANC visits contributes significantly to reducing maternal and neonatal morbidity and mortality [7][8]. However, several reports suggest that K6 coverage at the primary healthcare level has not yet reached optimal targets [9][10]. Low antenatal visit coverage is not solely attributable to service availability but is also influenced by maternal characteristics as healthcare users [11][12]. These characteristics include age, educational level, employment status, parity, knowledge, and attitudes toward healthcare services [13]. Health behavior theories explain that individual characteristics play an important role in shaping perceptions, motivation, and decision-making related to the utilization of healthcare services [14][15].

Maternal education is a crucial determinant of ANC utilization. Women with higher educational attainment tend to have better health literacy and a greater understanding of the importance of routine pregnancy examinations [16][17]. In addition, maternal knowledge regarding danger signs in pregnancy and the benefits of antenatal visits influences adherence to scheduled care [18][19]. Maternal attitudes toward healthcare services also represent a key factor, as positive attitudes can enhance intention and health-seeking behavior [20][21]. Age and parity also contribute to antenatal care behavior. Women within a healthy reproductive age range and those with previous pregnancy experience may perceive pregnancy risks differently [22][23]. Meanwhile, employment status may affect the availability of time and access to healthcare facilities [24][25]. Previous studies have shown that the interaction of demographic and psychosocial factors contributes to variations in ANC coverage across regions [26][27]. The working area of Parung Panjang Primary Health Center in Bogor Regency is one of the regions still facing challenges in achieving optimal K6 coverage. Maternal health service records indicate that some pregnant women have not completed antenatal visits according to established standards [28]. This situation requires a more in-depth investigation to understand maternal characteristics associated with adherence to ANC visits [29]. Such information is essential as a basis for developing more effective promotive and preventive interventions at the primary healthcare level [30]. Based on this background, the present study aims to analyze the characteristics of pregnant women and examine the association between these characteristics and K6 antenatal visit coverage in the working area of Parung Panjang Primary Health Center in 2025. The findings are expected to contribute to the development of strategies to improve the utilization of maternal health services.

II. METHODS

This study employed a quantitative analytic design using a cross-sectional approach to examine the association between maternal characteristics and the coverage of K6 antenatal visits. The study was conducted in the working area of Parung Panjang Primary Health Center, Bogor Regency, West Java Province, in 2025. The study population comprised all pregnant women registered in the working area of Parung Panjang Primary Health Center during the study period. A total of 154 pregnant women were included as respondents using a total sampling technique, whereby all members of the population who met the inclusion criteria were recruited. The inclusion criteria were pregnant women residing in the study area, having documented antenatal visit records in the Maternal and Child Health (MCH) handbook, and providing consent to participate. Respondents with incomplete data were excluded from the analysis. The dependent variable was K6 antenatal visit coverage, categorized as complete or incomplete based on antenatal visit records documented in the MCH handbook. Independent variables were limited to maternal characteristics, including age (healthy reproductive age vs. high-risk age), educational level (low vs. high), employment status (employed vs. unemployed), parity (primiparous vs. multiparous), level of knowledge (good vs. poor), and attitudes toward antenatal care (positive vs. negative).

Data were collected using a structured questionnaire that had undergone validity and reliability testing, as well as through verification of antenatal visit records from the MCH handbook and primary health center registries. Data collection was conducted by the researcher with the assistance of trained enumerators. Prior to data collection, all respondents were informed about the purpose of the study and provided written informed consent. Data analysis was performed in several stages. Univariate analysis was used to describe the frequency distribution and percentages of respondent characteristics and K6 visit coverage. Bivariate analysis was conducted using the chi-square test to assess the association between maternal characteristics and K6 coverage. Variables with p -values < 0.25 in the bivariate analysis were included in a multivariate analysis using multiple logistic regression to identify the most influential maternal characteristics associated with K6 coverage. The results were presented as odds ratios (ORs) with 95% confidence intervals, and statistical significance was set at $p < 0.05$. All analyses were performed using statistical software. This study received ethical approval from the Health Research Ethics Committee of Universitas Respati Indonesia and permission from Parung Panjang Primary Health Center. Respondent confidentiality was strictly maintained, and all data were used solely for research purposes.

III. RESULT AND DISCUSSION

This study involved 154 pregnant women in the service area of Parung Panjang Primary Health Center in 2025. The analysis was conducted to describe the coverage of K6 antenatal visits and to examine the association between maternal characteristics and the completeness of antenatal care visits.

Univariate Analysis

More than half of the pregnant women had not completed the recommended K6 antenatal visits. A total of 53.9% of respondents did not meet the standard number of visits, while 46.1% completed the visits (Table 1). These findings indicate that the utilization of antenatal services remains a challenge at the primary healthcare level.

Table 1. Distribution of K6 Antenatal Visit Coverage

K6 Coverage	n	%
Incomplete	83	53,9
Complete	71	46,1
Total	154	100

The distribution of maternal characteristics showed that most respondents were within the healthy reproductive age range (70.1%), had low educational attainment (53.2%), were unemployed (61.7%), and were multiparous (62.3%). In addition, the majority of mothers had poor knowledge (57.1%) and negative attitudes toward antenatal visits (59.7%), as presented in Table 2.

Table 2. Characteristics of Pregnant Women

Variable	Category	n	%
Age	At risk	46	29.9
	Healthy reproductive age	108	70.1
Education	Low	82	53.2
	High	72	46.8
Employment	Unemployed	95	61.7
	Employed	59	38.3
Parity	Primiparous	58	37.7
	Multiparous	96	62.3
Knowledge	Poor	88	57.1
	Good	66	42.9
Attitude	Negative	92	59.7
	Positive	62	40.3

Bivariate Analysis

The chi-square test results showed that maternal education, knowledge, and attitude were significantly associated with K6 antenatal visit coverage ($p < 0.05$). Mothers with higher education were 3.85 times more likely to complete K6 visits. Good knowledge increased the likelihood of compliance by 5.12 times, while a positive attitude increased the likelihood by 6.04 times (Table 3).

Table 3. Association Between Maternal Characteristics and K6 Coverage

Variable	p-value	OR
Age	0.214	1.43
Education	0.001	3.85
Employment	0.118	1.62
Parity	0.276	1.31
Knowledge	0.000	5.12
Attitude	0.000	6.04

Multivariate Analysis

Logistic regression analysis indicated that maternal attitude was the most dominant factor after controlling for education and knowledge (Table 4).

Table 4. Multivariate Logistic Regression Results

Variable	p-value	OR
Education	0.012	3.21
Knowledge	0.004	4.78
Attitude	0.001	6.55

Discussion

The low coverage of K6 antenatal visits observed in this study reflects a gap between service availability and its utilization by pregnant women. This finding is consistent with national and international reports indicating that adherence to antenatal visits remains a major challenge in improving maternal health [1][2]. Incomplete antenatal care may delay the detection of complications such as anemia, hypertension, and fetal growth disorders [3][4]. Therefore, improving adherence to antenatal visits is a critical priority in maternal healthcare services. Maternal education was significantly associated with K6 visit coverage. Higher education enhances a mother's ability to understand health information, communicate with healthcare providers, and make informed decisions regarding pregnancy care [5][6]. Education is also linked to improved health literacy and better access to relevant information sources [7]. Previous studies have shown that women with higher educational attainment are more likely to utilize antenatal services optimally [8][9]. In this study context, the high proportion of mothers with low educational levels may partly explain the low K6 coverage. Maternal knowledge regarding pregnancy had a strong influence on antenatal visit behavior. Women who understand the benefits of antenatal care and the risks of pregnancy complications are more motivated to attend routine check-ups [10][11].

Knowledge is a central component of health behavior change models that shape perceptions of risk and benefit [12]. Effective health education programs have been shown to improve adherence to antenatal visits by increasing maternal understanding [13][14]. The findings of this study reinforce the importance of systematic and continuous educational interventions at the primary healthcare level. Maternal attitude emerged as the most dominant factor in this study. Attitude reflects a mother's subjective evaluation of antenatal services, including perceptions of comfort, benefits, and trust in healthcare providers [15]. According to the theory of planned behavior, attitude plays a direct role in shaping intention and behavior [16][17]. Mothers with positive attitudes are more likely to consistently seek healthcare services [18]. Previous research has also identified attitude as a strong predictor of maternal service utilization [19][20]. In this context, fostering positive attitudes can be achieved through effective interpersonal communication, counseling, and high-quality service experiences. The absence of significant associations between age, employment, and parity with K6 coverage suggests that demographic factors do not always determine antenatal visit behavior. Some studies report similar findings, indicating that psychological and cognitive factors may be more influential than demographic characteristics [21][22].

Nevertheless, maternal age and pregnancy experience may still shape risk perceptions that influence behavior [23]. These findings highlight the importance of comprehensive health promotion approaches. Community-based interventions, such as maternal classes, group education sessions, and individual counseling, have been shown to effectively improve maternal knowledge and attitudes [24][25]. Family involvement and social support can further strengthen mothers' motivation to utilize antenatal services [26]. The role of healthcare providers in delivering empathetic and continuous educational communication is also essential in improving visit adherence [27][28]. Practically, this study provides implications for strengthening maternal health programs at the primary healthcare level. Strategies to increase K6 visit coverage should emphasize health education, improved quality of service communication, and the development of community-based programs [29][30]. These approaches are expected to enhance awareness and participation among pregnant women in optimally utilizing antenatal services.

IV. CONCLUSION

This study demonstrates that the coverage of K6 antenatal visits in the Parung Panjang Primary Health Center service area in 2025 remains suboptimal, with more than half of pregnant women failing to complete visits according to recommended standards. This condition indicates that the utilization of maternal health services still needs to be improved to ensure early detection of pregnancy complications and to enhance maternal and fetal safety. Maternal characteristics play an important role in determining the completeness of antenatal visits. The analysis revealed that education, knowledge, and maternal attitudes were significantly associated with K6 visit coverage. Women with higher educational attainment tended to have a better understanding of the importance of pregnancy examinations. Adequate knowledge contributed to increased awareness and regular attendance at antenatal visits. Maternal attitude toward antenatal services emerged as the most dominant factor influencing visit compliance after controlling for other variables. In contrast, age, employment status, and parity were not significantly associated with K6 visit coverage. These findings suggest that behavioral and cognitive factors may play a more critical role than demographic characteristics alone. Overall, improving antenatal visit coverage is strongly influenced by efforts to strengthen health education and foster positive maternal attitudes toward healthcare services.

V. RECOMMENDATIONS

Parung Panjang Primary Health Center is recommended to strengthen maternal health education programs through structured health promotion activities, antenatal classes, and individualized counseling that emphasize the importance of completing antenatal visits. Educational materials should be tailored to mothers' educational levels to enhance comprehension, improve knowledge, and promote positive attitudes. Healthcare providers are encouraged to improve interpersonal communication skills and adopt a more persuasive and supportive approach in delivering antenatal care. The development of community-based programs, including the involvement of community health volunteers and integrated health post activities, may help reach pregnant women who are at risk of incomplete K6 visits. Future researchers are advised to conduct longitudinal or interventional studies to evaluate the effectiveness of educational programs in increasing antenatal visit coverage. Further research should also consider broader social and environmental factors to obtain a more comprehensive understanding of the determinants of maternal healthcare utilization.

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