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THE RELATIONSHIP BETWEEN ACCESS TO HEALTH SERVICES AND THE FREQUENCY OF ANTENATAL CARE (ANC) VISITS AMONG PREGNANT WOMEN AT PUSKESMAS KOTA TENGAH

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ABSTRACT

ANC services are a crucial preventive effort to detect early pregnancy complications and reduce maternal mortality rates. However, the frequency of antenatal care (ANC) visits among pregnant women remains low, despite the wide availability of health service facilities. This study aimed to determine the relationship between access to health services and the frequency of ANC visits among pregnant women at Kota Tengah Public Health Center. This study employed a quantitative research design using a cross-sectional method. The population consisted of all pregnant women in the working area of Kota Tengah Public Health Center, totaling 192 pregnant women. A total of 67 pregnant women were selected as samples using purposive sampling technique. The research instrument used was a questionnaire. The results showed that most respondents had good access to health services and complete ANC visit frequency. Statistical analysis using the chi-square test revealed a significant relationship (p-value = 0.009) between access to health services and the frequency of ANC visits among pregnant women in the working area of Kota Tengah Public Health Center. Access to health services was significantly associated with the frequency of ANC visits among pregnant women at Kota Tengah Public Health Center (p = 0.009).

Keywords: *Health service access, antenatal care, frequency of ANC visits, pregnant women, pregnancy.*

INTRODUCTION

Antenatal care (ANC) plays an essential role in preventing adverse pregnancy outcomes by enabling the timely identification of potential complications and contributing to efforts to reduce maternal mortality. Nevertheless, the utilization of ANC services, as reflected in the number of visits made by pregnant women, remains suboptimal even where healthcare facilities are readily accessible. To enhance maternal and perinatal health outcomes, the World Health Organization (WHO) advises that pregnant women receive at least eight ANC contacts throughout pregnancy (WHO, 2022). In Indonesia, the Integrated Antenatal Care Service Guidelines establish a national standard of at least six ANC visits during pregnancy (Kemenkes RI, 2021). Therefore, although the WHO recommendation provides an international reference, the present study uses the Indonesian national standard of a minimum of six visits to classify ANC attendance as complete or incomplete. This distinction is important to ensure that the operational definition of ANC completion is consistent with the national guidelines applied in the study.

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The low utilization of ANC services is a global concern because it contributes to high maternal mortality. In 2023, pregnancy-related complications claimed the lives of approximately 287,000 women worldwide, and the majority of these deaths (94%) occurred in developing countries (WHO, 2023). Indonesia continues to face a considerable maternal mortality burden, with an MMR of 189 deaths per 100,000 live births. This figure remains substantially higher than the SDGs target, which aims to reduce maternal mortality to 70 deaths per 100,000 live births (Kemenkes RI, 2024). At the provincial level, Gorontalo reported an MMR of 151 deaths per 100,000 live births in 2023 (Dinkes Provinsi Gorontalo, 2024). Meanwhile, in Gorontalo City, there were five maternal deaths among 3,270 live births, equivalent to approximately 153 maternal deaths per 100,000 live births (Dinkes Kota Gorontalo, 2025).

Maternal mortality in Indonesia is mainly caused by severe bleeding, eclampsia, sepsis, and childbirth complications, which are often preceded by pregnancy warning signs that are not promptly recognized by pregnant women or healthcare providers. These conditions can be detected through structured and high-quality ANC services. ANC examinations enable the early identification of pregnancy-related problems, allowing appropriate and timely management to be provided (WHO, 2023). These data indicate that inadequate adherence to ANC visits may increase the risk of maternal mortality, making it a priority issue in regional health policy.

Receiving fewer than six ANC visits throughout pregnancy, with the recommended distribution of one visit in the first trimester, two in the second, and three in the third, may adversely affect the health of both the mother and the fetus. Women who do not attend regular ANC examinations may have a higher risk of complications such as preeclampsia, postpartum hemorrhage, infection, and low birth weight (Wulandari et al., 2021). In addition, inadequate early detection may delay the timely management of obstetric emergencies. Indirect consequences include an increased economic burden on families due to the costs of treating complications and reduced social productivity. In the long term, inadequate ANC utilization may hinder progress toward achieving the 2030 SDGs related to maternal and child health (WHO, 2023).

To strengthen the availability, accessibility, and quality of antenatal care (ANC), the Indonesian government has introduced several national initiatives. These include the Healthy Living Community Movement (GERMAS), the Healthy Indonesia Program through a Family Approach (PIS-PK), and the Acceleration Program for Reducing Maternal and Infant Mortality (PPAKIB), all of which form part of the country's broader maternal health policy framework (Kemenkes RI, 2023). In addition, the Minimum Service Standards (SPM) in the health sector require local governments to ensure that pregnant women receive ANC services at least six times during pregnancy. At the local level, the Gorontalo City Health Office has strengthened the emergency obstetric and neonatal referral network, including Basic Emergency Obstetric and Neonatal Care (PONED) services at public health centers, and implemented home visits by midwives to improve ANC coverage. Nevertheless, challenges remain, particularly in addressing transportation barriers, community perceptions, and shortages of health personnel in

several public health center service areas.

At the primary healthcare level, improving the continuity of ANC visits may require strategies tailored to the access-related challenges experienced by pregnant women. These strategies may include strengthening appointment reminders and follow-up for women who miss scheduled visits, providing clear information about available ANC services, improving coordination between public health centers, clinics, and private medical practices, and considering outreach services for women who experience difficulties accessing healthcare facilities. The results of this research are expected to provide valuable insights for local healthcare providers into the role of healthcare access in determining ANC service utilization. Furthermore, these findings may serve as a basis for formulating locally tailored approaches to encourage regular attendance at ANC visits.

Inadequate health education delivered by healthcare personnel, coupled with pregnant women's limited understanding of the role of ANC in identifying potential obstetric complications at an early stage, may contribute to insufficient ANC utilization. Such circumstances can have serious consequences, including maternal anemia, childhood stunting, complications during pregnancy and delivery, as well as increased maternal and child mortality (Sholikah et al., 2023).

Previous research has also highlighted the relationship between healthcare accessibility and the regularity of ANC attendance. Idris and Sari (2023) reported that pregnant women who encountered fewer barriers in reaching healthcare facilities had a 2.3-fold greater likelihood of completing the recommended ANC visits compared with those facing geographical constraints. In addition, pregnant women who utilize ANC services at health facilities with easier access and more diverse service options, such as clinics and private medical practices, may have greater opportunities to complete ANC visits according to the recommended standard than women who rely solely on public health centers. This finding emphasizes the important role of flexibility and ease of access in improving ANC attendance. Another study by Wulandari et al. (2021) identified economic barriers and limited access to information as dominant factors associated with low ANC attendance in eastern Indonesia. The study also reported a shift in ANC utilization from public health centers to private health facilities, particularly in urban areas. Pregnant women tended to choose clinics or private medical practices because of more flexible service hours, shorter waiting times, and more personalized services. This situation may contribute to lower ANC utilization at public health centers, even when these facilities are geographically easier to access.

Previous research has established a link between healthcare accessibility and ANC attendance patterns. Nevertheless, the extent of this relationship may differ according to geographical conditions, financial circumstances, healthcare service arrangements, and sociocultural influences. Access to health services may be associated with more timely service utilization, greater awareness of the importance of ANC, and improved interaction with healthcare professionals. Conversely, physical, financial, and social barriers may be associated with lower ANC attendance (Aryastami & Mubasyiroh, 2023). Despite the growing body of research on healthcare access and ANC utilization, further investigation

is required to understand the completeness of ANC attendance within specific local settings, particularly among pregnant women served by Kota Tengah Public Health Center. To address this need, the present study explores how access to healthcare services relates to ANC visit frequency among women in their third trimester. The findings are expected to provide locally relevant evidence to support the development of strategies for strengthening the continuity of maternal healthcare. Accordingly, this study sought to assess the association between healthcare access and the frequency of antenatal care (ANC) visits among pregnant women in the service area of Kota Tengah Public Health Center.

Preliminary data obtained from Kota Tengah Public Health Center in 2025 indicated that 498 pregnant women were enrolled in the Maternal and Child Health (KIA) program. The recorded ANC coverage rates showed a gradual decline across visits, reaching 97% for the first visit (K1), 89% for the fourth visit (K4), and 86% for the sixth visit (K6). These data indicate that most pregnant women had established initial contact with health professionals during the first trimester, reflecting a positive level of awareness regarding ANC utilization. However, a declining trend in visit coverage was observed as pregnancy progressed, indicating persistent barriers to the continuity of ANC services. Although K6 coverage reached 86%, the decline from K1 (97%) to K4 (89%) and K6 (86%) indicates that some pregnant women did not continue ANC visits throughout pregnancy. This pattern is important because consistent ANC attendance enables ongoing monitoring of maternal and fetal health, timely identification of pregnancy-related complications, and appropriate referral when necessary. Therefore, understanding the factors associated with ANC visit frequency, particularly access to health services, is important for identifying potential barriers to continuity of care and informing strategies to improve ANC utilization at the primary healthcare level. In view of the issues outlined above, this study was undertaken to investigate the association between access to healthcare services and the frequency of antenatal care (ANC) visits among pregnant women at Kota Tengah Public Health Center.

RESEARCH METHOD

A quantitative study using a cross-sectional design was carried out at Kota Tengah Public Health Center, Gorontalo City, Gorontalo Province, between March and April 2026. Healthcare access served as the independent variable, whereas the frequency of antenatal care (ANC) visits was designated as the dependent variable. The target population comprised 192 pregnant women residing within the health center's service area. Using Slovin's formula, a total sample of 67 third-trimester pregnant women was determined and recruited through purposive sampling according to established eligibility criteria. Participants were eligible for inclusion if they were in their third trimester, lived within the designated study area, agreed to take part by providing informed consent, and were capable of understanding and responding to the research questions. The exclusion criteria were women with cognitive or mental conditions that prevented reliable responses and those with medical conditions that prevented participation. Potential selection bias

associated with purposive sampling is acknowledged; therefore, generalization of the findings to other populations should be made with caution.

This research utilized two categories of data: primary and secondary. Primary information was gathered firsthand by administering questionnaires to each participant selected for the study. Meanwhile, secondary information was compiled from records maintained by the Maternal and Child Health (KIA) unit at the Public Health Center, as well as relevant literature sources. The research instrument was a questionnaire containing respondent characteristics, including initials, age, education, occupation, parity, and gestational age. The questionnaire also included data on access to healthcare services, including geographic, economic, healthcare service organization, and sociocultural aspects, as well as records of pregnant women's ANC attendance frequency.

The research instrument was a modified questionnaire developed based on theories of healthcare access and previous studies (Adnani et al., 2025; Apriady et al., 2022; Hanifah, 2022; Idris & Sari, 2023; Sahasika & Puspitasari, 2022; Tunny & Astuti, 2022; Wulandari et al., 2021) The instrument covered respondent characteristics and four dimensions of healthcare access: geographic accessibility, economic accessibility, healthcare service organization and sociocultural factors. The healthcare access questionnaire consisted of 20 statements covering four dimensions: geographic accessibility, economic accessibility, healthcare service organization, and sociocultural factors. Responses were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The total scores were converted into percentages and categorized as good (≥75%), moderate (60–74%), or poor (<60%) healthcare access. The questionnaire's validity and reliability were tested using data from 30 respondents. Item validity was assessed through corrected item–total Pearson correlations, with a critical r-value of 0.361 ($\alpha = 0.05$, two-tailed, df = 28). All 20 items were valid, with correlation coefficients ranging from 0.637 to 0.840. Reliability testing using Cronbach's alpha produced a coefficient of 0.966, indicating excellent internal consistency. Thus, the questionnaire demonstrated satisfactory validity and reliability in the tested sample.

The collected data were processed through descriptive and inferential statistical analyses. Descriptive analysis was used to present the participants' characteristics, covering age, educational attainment, occupation, parity, and gestational age, along with the distribution of healthcare access levels and ANC visit frequency. Meanwhile, inferential analysis was undertaken to assess the association between access to healthcare services and the frequency of ANC visits by applying the chi-square test.

RESULTS AND DISCUSSION

Results

Respondents' Characteristics

The study involved 67 pregnant women, whose demographic and obstetric profiles were examined in terms of age, educational attainment, occupation, parity, gestational age, and the type of healthcare facility utilized for antenatal care (ANC). The distribution of these participant characteristics is summarized in Table 1.

Table 1. Distribution of Respondents' Characteristics

Characteristics	Frequency	Percentage
Age		
< 21 years	5	7.5
21–35 years	58	86.5
> 35 years	4	6.0
Education		
Elementary School	4	6.0
Junior High School	10	14.9
Senior High School	30	44.8
College/University	23	34.3
Occupation		
Housewife	44	65.7
Civil Servant/Military/Police Officer	13	19.4
Honorary Employee	5	7.5
Entrepreneur/Self-employed	5	7.5
Parity		
Nulliparous	7	10.4
Primiparous	18	26.9
Multiparous	42	62.7
Gestational Age		
28–31 weeks	22	32.8
32–36 weeks	35	52.2
> 37 weeks	10	15.0
Type of Health Facility		
Community Health Center	24	35.8
Clinic	30	44.8
Private Practice	13	19.4
Total	67	100.0

Sumber: Primary Data (2026)

As presented in Table 1, the age distribution revealed that the largest proportion of participants fell within the 20–35-year age group, accounting for 58 women (86.5%). This suggests that most pregnant respondents were in the optimal reproductive age range. The classification of maternal age into <20 years, 20–35 years, and >35 years is commonly used in maternal health studies to categorize reproductive risk. Maternal age below 20 years is considered a risk factor because the reproductive organs and psychological readiness may not yet be fully mature, making women more vulnerable to pregnancy and childbirth complications. Women aged 20–35 years are generally regarded as being within the optimal reproductive period, as their physical, psychological, and reproductive functions are typically well developed, contributing to a lower likelihood of pregnancy-related complications. Meanwhile, maternal age above 35 years is categorized as a high-risk group due to declining reproductive function and an increased likelihood of comorbidities, such as hypertension, diabetes, and obstetric complications. Therefore, this age classification is frequently used to assess the influence of maternal age on health behavior and maternal health status (Kemenkes RI, 2022; Prawirohardjo, 2022; WHO, 2022).

Regarding educational attainment, the majority of participants had completed senior high school, representing 30 respondents (44.8%), while 23 respondents (34.3%) had attained higher education. This pattern is comparable to the findings of Akib (2025), who found that senior high school was the predominant educational level among pregnant women, accounting for 14 participants (46.7%).

In terms of occupational status, housewives constituted the largest group, comprising 44 participants (65.7%). A similar pattern was observed in the study conducted by Lorensa et al. (2021), in which the majority of participants were classified as unemployed or housewives, totaling 33 respondents (80.5%).

Based on the study findings, most respondents were classified as multiparous, accounting for 42 respondents (62.7%). These results suggest that most pregnant women included in the study had prior experience of pregnancy and childbirth. This result is consistent with the study by Idris and Sari (2023), which found that most respondents were multiparous and that previous pregnancy experience influenced the utilization of antenatal care services more positively.

Based on the distribution of gestational age, most respondents were between 32 and 36 weeks of gestation, comprising 35 respondents (52.2%). This finding is consistent with the study by Andriani et al. (2022), which reported that pregnant women in the later stages of pregnancy tend to be more active in utilizing maternal health services as part of efforts to maintain maternal and fetal well-being in preparation for childbirth.

Based on the distribution of the type of health facility, most respondents utilized clinics, accounting for 30 respondents (44.8%). A similar observation was made by Wulandari et al. (2021), who found that pregnant women living in urban settings benefit from broader access to healthcare facilities. This availability provides them with greater flexibility in selecting ANC services based on their individual needs and perceptions of healthcare quality.

Univariate Analysis

Descriptive statistical analysis was performed to present the distribution of healthcare access levels and ANC visit frequency among the 67 study participants. Healthcare access was categorized as good, moderate, or poor, while ANC visit frequency was classified as complete or incomplete according to the study's operational definitions. The findings for these variables are summarized in Table 2.

Table 2. Distribution of Health Service Access and Frequency of Antenatal Care Visits

Variable	Frequency	Percentage
Health Service Access		
Good	30	44.8
Moderate	22	32.8
Poor	15	22.4
Frequency of ANC Visits		
Complete	40	59.7
Incomplete	27	40.3
Total	67	100.0

Sumber: Primary Data (2026)

As indicated in Table 2, 40 respondents (59.7%) had fulfilled the recommended ANC visit schedule, whereas 27 (40.3%) had not completed the required visits. A comparable result was reported by Idris & Sari (2023), who found that most participants had completed their ANC visits, representing 75.2% of the respondents.

Bivariate Analysis

The association between healthcare access and ANC visit frequency was assessed through bivariate analysis involving 67 respondents. A chi-square statistical test was applied to evaluate the significance of the relationship between these variables. The findings obtained from this analysis are reported in Table 3.

Table 3. Relationship between Access to Health Services and Frequency of ANC Visits

Access to Health Services	Frequency of ANC Visits				Total		*p-value*	X^2
	Complete		Incomplete					
	n	%	n	%	n	%		
Good	24	35,8	6	9,0	30	44,8		
Moderate	10	14,9	12	17,9	22	32,8	0,009	9,414
Poor	6	9,0	9	13,4	15	22,4		
Jumlah	40	59,7	27	40,3	67	100,0		

Sumber: Primary Data (2026)

The most prevalent category comprised 24 respondents (35.8%) who reported good access to healthcare services and had completed their ANC visits. In comparison, 6 respondents (9.0%) with good access had incomplete ANC visits, while 6 respondents (9.0%) with poor access had complete ANC visits. Among respondents with moderate access, 10 (14.9%) had complete ANC visits and 12 (17.9%) had incomplete ANC visits. The Pearson chi-square analysis identified a significant relationship between healthcare access and ANC visit frequency among pregnant women receiving care at Puskesmas Kota Tengah ($\chi^2 = 9.414$, df = 2, p = 0.009). The effect size, measured using Cramér's V, was 0.375 (95% CI: 0.096–0.598), indicating an association of moderate magnitude, although the confidence interval suggests uncertainty in the estimated strength of the association.

Discussion

Access to Health Services

Among the 67 participants, good access to healthcare services was the most frequently reported category, comprising 30 respondents (44.8%). This result indicates that most pregnant women have obtained ease of access in utilizing health services during pregnancy. Respondents classified as having good healthcare access generally assigned high ratings (4–5) across all dimensions of service accessibility.

In the geographical aspect, most respondents stated that the distance from home to health facilities was easily reachable, travel time was not an obstacle, and transportation to health facilities was well available. This indicates that the location of health services was quite close to respondents' places of residence, thereby making it easier for mothers to make ANC visits. In the economic aspect, the majority of respondents stated that the cost of antenatal examinations was still affordable and that the presence of BPJS/KIS (National Health Insurance) helped them obtain health services. In the organizational aspect, respondents rated health workers as friendly, service waiting times as not too long, and ANC examination facilities as adequate. Meanwhile, in the cultural aspect, most respondents received support from their families and husbands in undergoing routine ANC examinations.

According to Andersen's Health Service Utilization Model, the use of healthcare services is determined by three fundamental components: predisposing, enabling, and need factors. Within the scope of this study, healthcare access falls under the enabling component, which encompasses conditions that facilitate individuals' use of health services, including facility availability, geographical distance, service costs, and family resources. More favorable enabling conditions are generally associated with a higher likelihood of healthcare utilization (Silaen et al., 2025). Similarly, Penchansky and Thomas conceptualize healthcare access through five interrelated dimensions: availability, accessibility, accommodation, affordability, and acceptability. These dimensions may shape pregnant women's preferences and decisions when selecting healthcare facilities.

These findings are consistent with those of Idris and Sari (2023), who demonstrated that accessibility of healthcare facilities, travel distance, and the availability of healthcare personnel play important roles in determining the utilization of antenatal services in Indonesia. Similarly, Sumarni (2022) reported that 51 respondents (83.6%) had convenient access to health information, while 43 respondents (70.5%) indicated that healthcare facilities were located within close proximity to their residences. The results of research by Rizkianti and Saptarini (2021) also showed that access to health services was influenced by factors of distance, cost, transportation, and the availability of health facilities.

In the group with poor access to health services, there were 15 respondents (22.4%). The poor category of access to health services indicates that some pregnant women still experience considerable barriers in obtaining health services. Participants classified as having poor healthcare access generally assigned low ratings (1–2) to several questionnaire items. In the geographical aspect, respondents stated that the distance to health facilities was quite far and limited transportation was an obstacle to undergoing ANC. In the economic aspect, several respondents stated that transportation costs were still burdensome for their families. In the organizational aspect, respondents complained about long service waiting times and inadequate service facilities. Meanwhile, in the cultural aspect, some respondents received insufficient family support or were still influenced by certain beliefs related to pregnancy examinations.

Wahyuni et al., as referenced by Irianto et al. (2026), explain through Andersen's Behavioral Model of Health Service Use that enabling factors, including healthcare facility availability, financial capacity, and social support, play an important role in shaping individuals' ability to access and utilize healthcare services (Irianto et al., 2026). These findings are also supported by Wulandari et al. (2021), who identified financial constraints, transportation difficulties, and inadequate social support as barriers that limit some pregnant women's access to maternal healthcare services.

The researcher interprets the relatively high proportion of pregnant women with good healthcare access in the service area of Puskesmas Kota Tengah as potentially related to its urban setting. This environment provides greater availability and easier access to various healthcare facilities, such as public health centers (puskesmas), clinics, and privately operated medical practices. In addition, the availability of health insurance, ease of transportation, and increasing public awareness of the importance of antenatal examinations also support ease of access to health services. Nevertheless, there are still respondents with poor access, which may be influenced by economic limitations, work commitments, or certain perceptions of health services.

Frequency of ANC Visits

The findings revealed that 40 of the 67 participants (59.7%) had completed the recommended ANC visits. This suggests that most pregnant women demonstrated a relatively good level of awareness regarding the importance of utilizing maternal healthcare services in accordance with established guidelines. Adherence to the recommended ANC schedule also indicates women's engagement in monitoring their own health and fetal development throughout pregnancy, thereby facilitating the early identification of potential complications.

These findings may be interpreted in light of the antenatal care recommendations established by the World Health Organization (WHO) and the Indonesian Ministry of Health. According to WHO, pregnant women should receive at least eight ANC contacts throughout pregnancy to support maternal and fetal well-being, enable the timely identification of potential complications, and enhance pregnancy outcomes (WHO, 2022). Meanwhile, Indonesian national guidelines recommend a minimum of six ANC visits during pregnancy (Kemenkes RI, 2020). Accordingly, the classification of ANC completion in the present study followed the national standard adopted as the study reference. Consistent antenatal care attendance plays an essential role in assessing maternal and fetal conditions, detecting pregnancy-related risks at an early stage, and delivering appropriate healthcare interventions and education.

Regarding maternal age, the majority of participants belonged to the 20–35-year age group, which is generally considered the optimal reproductive period. This stage, often associated with early middle adulthood, is characterized by greater emotional maturity, accumulated life experience, and more developed cognitive capacities. These characteristics may enhance women's understanding of pregnancy-related risks and the importance of regular antenatal care (ANC) visits. According to the theory in Experience

Human Development, middle adulthood is associated with an increase in reflective thinking function and the ability to make decisions based on experience. Therefore, mothers of mature age find it easier to absorb information and translate it into positive health behavior (Papalia et al., 2019).

Conversely, incomplete ANC attendance was observed among 27 participants, representing 40.3% of the total respondents. This finding can be associated with several respondent characteristics, including educational background. Based on Table 1, 14 respondents (20.9%) had a low level of education, comprising 4 respondents (6.0%) who had completed elementary school and 10 respondents (14.9%) who had completed junior high school. Lower educational attainment can be associated with difficulties in understanding health information and recognizing the importance of regular antenatal care. However, because this study did not specifically examine the association between educational level and ANC visit completion, this interpretation should be made cautiously.

From a theoretical perspective, the association between educational attainment and incomplete ANC attendance may be understood through the Health Belief Model (HBM), which suggests that education can shape individuals' perceptions of disease severity and the benefits of preventive health behaviors. Pregnant women with low education often do not fully understand the serious impact of pregnancy complications or the benefits of early detection through ANC, and therefore view ANC visits as a secondary need. This low perception of benefits reduces motivation to comply with the examination schedule (Glanz et al., 2021). These findings are supported by previous studies. Lorensa et al. (2021), reported that 80.5% of pregnant women had completed the recommended ANC visits. Similarly, Idris & Sari (2023) found that the majority of their respondents fulfilled the recommended ANC schedule, accounting for 75.2% of participants.. Furthermore, research by Aryastami and Mubasyiroh (2023) reported that pregnant women who complied with ANC visits (≥4 times) outnumbered those who did not comply.

Based on the results of this study, the researcher assumes that the high proportion of complete ANC visits among pregnant women in the study area is due to the condition of the urban area, which has more numerous and easily accessible health facilities, including public health centers (puskesmas), clinics, and private medical practices. In addition, increasing public awareness of the importance of pregnancy examinations also contributes to pregnant women's compliance in undergoing ANC. Nevertheless, the presence of respondents with incomplete visits indicates the need for continuous education and strengthening the role of health workers in reminding patients of pregnancy visit schedules.

The Relationship between Access to Health Services and the Frequency of ANC Visits among Pregnant Women

As presented in Table 3, 24 respondents (35.8%) reported good access to healthcare services and had completed their ANC visits. This finding suggests that pregnant women with better access to healthcare facilities are more likely to adhere to the recommended

minimum of six ANC visits throughout pregnancy. It also highlights the importance of healthcare accessibility in encouraging consistent maternal participation in antenatal care services.

With regard to the various dimensions of healthcare access, the most dominant aspects in this category are the organizational and cultural aspects, as seen from respondents' high scores on questions regarding the friendliness of health workers, comfort of service, and family support in undergoing ANC. This condition indicates that good health services and positive social support can improve pregnant women's compliance in undergoing pregnancy examinations.

The observed association may also be considered in light of the participants' characteristics, as most were aged 20–35 years, had attained at least a senior high school education, and had previous childbirth experience (multiparous). The healthy reproductive age group generally has a better level of awareness of the importance of maintaining pregnancy health. Higher education levels enable mothers to more easily receive health information and understand the benefits of ANC. The Revised Bloom's Taxonomy states that individuals with higher education tend to reach the cognitive levels of understanding, applying, and even analyzing, enabling them not only to recognize signs of emergency but also to understand the clinical implications and actions that need to be taken immediately (Nutbeam & Lloyd, 2021). In addition, previous pregnancy experience among multiparous mothers helps them become more accustomed to utilizing health services routinely.

This finding can be theoretically interpreted through Andersen's Behavioral Model of Health Service Use, which identifies three major determinants of healthcare utilization: predisposing, enabling, and need factors. Within this framework, access to healthcare services represents an enabling factor, referring to the resources and conditions that facilitate individuals' use of healthcare, including facility availability, financial capacity, transportation access, and family support. The better a person's enabling factors, the greater the individual's opportunity to utilize health services, including making complete ANC visits (Silaen et al., 2025).

Recent literature highlights that access to antenatal care is multidimensional and is shaped by socioeconomic, geographic, psychosocial, and health-system factors. In a recent systematic review, Ali et al. (2026) brought together findings on factors that hinder timely and adequate ANC utilization, highlighting the influence of socioeconomic circumstances, cultural practices, psychosocial aspects, and healthcare system-related conditions. Similarly, Alam et al. (2025) examined barriers to accessing ANC at the primary healthcare level, highlighting the importance of considering challenges encountered by women when seeking care. Geographic barriers, including travel distance and transportation difficulties, may limit the ability to attend scheduled visits, while financial constraints may increase the burden of seeking care. Organizational factors and support from family members may also influence women's experiences of care and their ability to return for subsequent visits. These findings support the need to assess access as a combination of enabling factors rather than as physical proximity alone. In the present

study, the significant association between healthcare access and ANC visit frequency (χ^2 = 9.414, df = 2, p = 0.009) suggests that access-related conditions are relevant to ANC utilization among pregnant women in the catchment area of Puskesmas Kota Tengah. However, the cross-sectional nature of this study limits the interpretation of the findings to an association between the variables, without establishing a causal relationship.

The findings are consistent with Idris and Sari (2023), who found that ANC completion was associated with factors such as health insurance, service location, travel time, and residence. Their national survey reported 75.2% ANC completion, with higher educational attainment associated with greater odds of completion (adjusted OR = 2.023; 95% CI: 1.839–2.225). Similarly, our study found a significant association between healthcare access and ANC visit frequency (χ^2 = 9.414, df = 2, p = 0.009; Cramér's V ≈ 0.375). Unlike their national analysis, our study assessed access across geographical, economic, organizational, and sociocultural dimensions. The results emphasize the need to strengthen access to healthcare across multiple dimensions to encourage consistent participation in ANC services. However, both cross-sectional studies demonstrate association rather than causation. Furthermore, research by Herwansyah et al. (2022), through a systematic review in Southeast Asia, concluded that service quality, availability of health workers, and ease of access are important factors influencing the utilization of maternal services, including ANC.

The findings revealed that 6 participants (9.0%) experienced incomplete ANC attendance despite having good access to healthcare services. This suggests that the availability and accessibility of healthcare facilities do not necessarily translate into consistent maternal adherence to recommended healthcare utilization. This result is related to the aspects of access to health services, where the most dominant aspects in this category are the geographical and organizational aspects, since most respondents still stated that health facilities were easily reachable and that health services were fairly good. Nevertheless, cultural aspects and individual factors may be the cause of mothers not completing ANC visits, such as lack of motivation, feeling that the pregnancy is healthy, or considering that examinations do not need to be conducted too frequently in the absence of complaints. These results can also be linked to respondent characteristics such as occupation, where some respondents in the group with good but incomplete access had employment status (66.6%). From the occupational aspect, working mothers often face role conflicts and time limitations. Theoretically, employment becomes a negative enabling factor in Andersen's Behavioral Model of Health Services Use; working mothers understand the importance of ANC, but economic priorities, inflexible working hours, and physical fatigue prevent them from completing ANC examinations fully (Irianto et al., 2026).

A similar finding was reported by Winda et al. (2024), who demonstrated that even when access in terms of distance between the Puskesmas and the mother's residence is close, if pregnant women lack the interest or desire to undergo routine pregnancy examinations, such visits will not occur. Regular ANC attendance is an essential aspect of maternal healthcare, and it requires convenient, comfortable, and timely access to

healthcare facilities. The research results show that respondents with poor access to health services who nevertheless made complete ANC visits numbered 6 respondents (9.0%). This result indicates that although pregnant women experience limitations in access to health services, such as barriers of distance, economy, transportation, or service, some mothers still have good awareness and motivation to undergo routine pregnancy examinations. This condition may be influenced by other factors outside access to health services, such as parity, where most of these pregnant women had multiparous status.

The most dominant aspects in this group are the cultural and organizational aspects, because despite geographical and economic barriers, respondents still received family support and had trust in the health services provided. This social support becomes a driving factor for mothers to continue undergoing routine ANC examinations. Kolb (2021) explains that multiparous mothers gain learning from previous pregnancy and childbirth experiences. Meanwhile, the Health Belief Model (HBM) theory explains that multiparous mothers with higher education have more realistic perceived susceptibility and perceived severity, as well as stronger perceived benefits of ANC. This increases the likelihood of mothers taking preventive action, including complying with the ANC schedule according to the standard (Glanz et al., 2021). Research by Ndruru et al. (2026) found that 7.4% of pregnant women who experienced difficulties accessing healthcare services nevertheless completed all six recommended ANC visits (K6). Regarding parity, 19.0% of multiparous respondents had completed their ANC visits.

The findings of the present study revealed that 9 respondents (13.4%) had poor access to healthcare services and had not completed the recommended ANC visits. This result indicates that limited access to health services can be a major obstacle for pregnant women in meeting the ANC visit standard. Low access to health services causes mothers to experience difficulty in reaching health facilities, making ANC visits irregular. The most dominant aspects in this group are the geographical and economic aspects, as the majority of respondents experienced barriers in reaching health facilities as well as limited funds to undergo routine ANC visits. This condition places mothers at greater risk of not meeting the standard for complete ANC visits.

These findings can be interpreted through the framework proposed by Penchansky and Thomas, which conceptualizes healthcare access in terms of five dimensions: availability, accessibility, accommodation, affordability, and acceptability. Among respondents with poor healthcare access, the accessibility and affordability dimensions may not have been adequately met, potentially contributing to irregular ANC attendance. Similarly, Andersen's model emphasizes that inadequate enabling resources, including transportation, financial capacity, and the availability of healthcare facilities, may hinder individuals' use of healthcare services (Yilmaz et al., 2025). Supporting this explanation, Rizkianti et al. (2021) found that pregnant women experiencing geographical and economic barriers were more likely to have incomplete ANC visits than those with better access to healthcare.

Statistical analysis using the chi-square test demonstrated a significant association between healthcare access and ANC visit frequency among pregnant women in the

service area of Puskesmas Kota Tengah ($\chi^2 = 9.414$, df = 2, p = 0.009). This finding suggests that pregnant women with better access to healthcare services tend to have a higher likelihood of completing the recommended ANC visits. Research by Rizkianti & Saptarini (2021) also showed that barriers in accessing health services, such as cost, distance, and transportation, increase the risk of low utilization of maternal services in Indonesia.

The findings suggest that healthcare accessibility is an important factor associated with the completeness of antenatal care (ANC) attendance among pregnant women. Pregnant women with good access to health services tend to find it easier to complete ANC visits, supported by ease of reaching health facilities, relatively affordable costs, adequate services, and support from the environment and family. Conversely, pregnant women with poor access to health services are at greater risk of not completing ANC visits due to geographical, economic, or health service limitations. Despite these limitations, some pregnant women with restricted access to healthcare services were still able to complete the recommended ANC visits. This may be related to individual characteristics, including age, educational background, level of awareness, previous pregnancy experience, understanding of the importance of ANC, and personal motivation to safeguard their own health and fetal well-being.

This study provides insight into the relationship between different dimensions of healthcare accessibility and the frequency of ANC attendance among pregnant women receiving services at Puskesmas Kota Tengah, Gorontalo. Previous research by Idris and Sari (2023) examined factors associated with ANC completion using national survey data, while Herwansyah et al. (2022) focused on examining the utilization of maternal healthcare services in primary healthcare facilities across Southeast Asia. Building on these studies, the present study provides local evidence by examining geographic, economic, organizational, and sociocultural dimensions of healthcare access in a specific primary healthcare setting. This multidimensional approach may help identify access-related issues that require further assessment and inform context-specific improvements in maternal healthcare services. However, given the cross-sectional approach and purposive sampling method employed, the results should be interpreted as evidence of an association rather than a causal relationship, with caution exercised when applying the findings to other populations or settings.

The findings have practical implications for improving the continuity of ANC services in primary healthcare settings. Puskesmas and similar maternal healthcare facilities may consider assessing barriers related to travel distance, transportation, out-of-pocket expenses, waiting times, service availability, and family support when planning interventions to improve ANC attendance. These recommendations are consistent with the findings of Herwansyah et al. (2022), which highlight the importance of service availability, healthcare workforce, and ease of access in maternal healthcare utilization. Potential strategies include strengthening appointment and follow-up systems, improving the responsiveness of healthcare providers, and involving families in maternal health education where appropriate. These strategies should be adapted to local circumstances

and evaluated to determine their effectiveness. Although this study was conducted at Puskesmas Kota Tengah, its multidimensional approach may provide a useful framework for assessing healthcare access barriers in other primary healthcare settings. However, the findings should be applied cautiously because healthcare infrastructure, population characteristics, and service organization may differ across locations.

CONCLUSION

The study findings demonstrate that most pregnant women attending Puskesmas Kota Tengah had good access to healthcare services (44.8%), while 59.7% had completed the recommended ANC visits. The Chi-square analysis further confirmed a statistically significant association between healthcare access and ANC visit frequency ($p = 0.009$), suggesting that better access is associated with a higher likelihood of completing the recommended antenatal visits. In light of these findings, Puskesmas management and healthcare professionals are encouraged to strengthen the quality and accessibility of ANC services while providing ongoing education and support for pregnant women. Educational institutions may also use these findings as a source of academic reference. Further research is recommended to explore additional determinants, including maternal knowledge, husband's support, healthcare service quality, and socioeconomic circumstances, while involving a wider study population and research setting.

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REFERENCES

Adnani, Q. E. S., Maulina, R., Ramadhan, K., Argaheni, N. B., Powell Kennedy, H., & Telfer, M. (2025). Trends and determinants of antenatal, intranatal, and postnatal care utilization among Indonesian women (2012–2017). *BMC Nursing*, *24*(912), 1–20. https://doi.org/10.1186/s12912-025-03527-6

Alam, C. El, Abbas, L. A., Ramadan, M. S., & Asmar, M. K. (2025). Exploring the barriers to accessing antenatal care at the primary health care center level of a tertiary hospital in Lebanon : a qualitative study. *BMC Health Services Research*, *25*(304), 1–14. https://doi.org/10.1186/s12913-025-12444-y

Ali, S. T., Rizvi, S. A., Talat, M., Abuzar, S., Azhar, M., & Rehman, M. (2026). Barriers to timely and adequate antenatal care : a systematic review of socioeconomic, cultural, psychosocial, and health-system factors across high and low resource settings. *BMC Pregnancy and Childbirth*, *26*(96), 1–9.

https://doi.org/10.1186/s12884-025-08565-1

Andriani, H., Rachmadani, S. D., Natasha, V., & Saptari, A. (2022). Continuum of care in maternal, newborn, and child health in Indonesia. *Asia-Pacific Journal of Public Health*, *11*(3), 1–9. https://doi.org10.1177/22799036221127619

Apriady, S., Batara, A. S., & Nurgahayu, N. (2022). Hubungan Akses Pelayanan Ibu Hamil dengan Kunjungan Antenatal Care Puskesmas Binanga Mamuju. *Window of Public Health Journal*, *5*(1), 1–8. https://doi.org/10.33096/woph.v5i1.637

Aryastami, N. K., & Mubasyiroh, R. (2023). Traditional practices influencing the use of maternal health care services in Indonesia. *PLoS ONE*, *16*(9), 1–14. https://doi.org/10.1371/journal.pone.0257032

Devi, R. (2025). Hubungan Tingkat Pendidikan Dan Sikap Ibu Hamil Dengan Kunjungan Antenatal Care Di Puskesmas Kabaena Barat. *Jurnal Ilmiah Kebidanan (Scientific Journal of Midwifery)*, *11*(1), 82–89. https://doi.org/10.33023/jikeb.v11i1.2483

Dinkes Kota Gorontalo. (2025). *Data Evaluasi Kematian Ibu dan Bayi*.

Dinkes Provinsi Gorontalo. (2024). *Profil Kesehatan Provinsi Gorontalo 2023*. Dinas Kesehatan Provinsi Gorontalo.

Glanz, K., Rimer, B. K., & Viswanath, K. (2021). *Health behavior: Theory, research, and practice* (6 (ed.)). Jossey-Bass.

Hanifah. (2022). Kajian Literatur : Faktor Yang Mempengaruhi Kepatuhan Pemeriksaan Antenatal Care (ANC) Pada Ibu Hamil. *Jurnal Ilmu Kesehatan Masyarakat Berkala (JIKeMB)*, *4*(2), 49–56. https://journal.univetbantara.ac.id/index.php/jikemb/article/view/3266

Herwansyah, H., Czabanowska, K., & Kalaitzi, S. (2022). The utilization of maternal health services at primary healthcare setting in Southeast Asia: A systematic review. *Asia-Pacific Journal of Public Health*, *32*(100726), 1–9. https://doi.org/10.1016/j.srhc.2022.100726

Idris, H., & Sari, I. (2023). Factors associated with the completion of antenatal care in Indonesia: A cross-sectional analysis. *Belitung Nursing Journal*, *9*(1), 79–88. https://pubmed.ncbi.nlm.nih.gov/37469642/

Irianto, S., Wulansari, I., & Suleman, I. (2026). The Relationship of Pregnant Women's Knowledge of Pregnancy Emergency Signs with Compliance in Antenatal Care (ANC) Examinations in the Working Area of the Sipatana Health Center. *International Journal of Health, Economics, and Social Sciences (IJHESS)*, *8*(2), 1099–1107. https://doi.org/10.56338/ijhess.v8i2.10521

Kemenkes RI. (2020). *Pedoman pelayanan antenatal, persalinan, nifas, dan bayi baru lahir di era adaptasi kebiasaan baru*. Kementerian Kesehatan RI. https://www.kemkes.go.id

Kemenkes RI. (2021). *Peraturan Menteri Kesehatan RI No. 21 Tahun 2021 tentang Pelayanan Kesehatan Persalinan*. Kementerian Kesehatan RI.

Kemenkes RI. (2022). *Pedoman Pelayanan Kesehatan Ibu Hamil di Fasilitas Kesehatan Dasar dan Rujukan*.

Kemenkes RI. (2023). *Pedoman Pelayanan Kesehatan Ibu dan Anak di Fasilitas*

Kesehatan Dasar dan Rujukan. Direktorat Jenderal Kesehatan Masyarakat.

Kemenkes RI. (2024). *Profil Kesehatan Indonesia Tahun 2024*. Kemenkes RI.

Kolb, D. A. (2021). *Experiential learning: Experience as the source of learning and development*. Pearson Education.

Lorensa, H., Nurjaya, A., & Ningsi, A. (2021). Hubungan tingkat pendidikan dan sikap ibu hamil dengan kunjungan antenatal care di Puskesmas Balla, Kecamatan Balla, Kabupaten Mamasa. *Jurnal Inovasi Penelitian*, *2*(5), 1491–1497. https://www.neliti.com/id/publications/469822/hubungan-tingkat-pendidikan-dan-sikap-ibu-hamil-dengan-kunjungan-antenatal-care

Nutbeam, D., & Lloyd, J. E. (2021). Understanding and responding to health literacy as a social determinant of health. *Annual Review of Public Health*, *42*, 159–173. https://doi.org/10.1146/annurev-publhealth-090419-102529

Papalia, D. E., Feldman, R. D., & Martorell, G. (2019). *Experience Human Development* (14th ed.). McGraw-Hill Education Companies.

Prawirohardjo, S. (2022). *Ilmu Kebidanan Edisi Revisi*. Yayasan Bina Pustaka Sarwono Prawirohardjo.

Rizkianti, A., & Saptarini, I. (2021). Perceived barriers in accessing health care and the risk of pregnancy complications in Indonesia. *International Journal of Women's Health*, *13*(2021), 761–772. https://doi.org/10.2147/IJWH.S310850

Sahasika, H. A., & Puspitasari, N. (2022). Faktor yang Berhubungan dengan Kunjungan Pelayanan Antenatal Care pada Ibu Hamil di Puskesmas Duduksampeyan Kabupaten Gresik. *Prepotif: Jurnal Kesehatan Masyarakat*, *7*(1), 951–958. https://journal.universitaspahlawan.ac.id/index.php/prepotif/article/view/13493

Sholikah, S. M., Wardani, N. K., & Harumi, A. M. (2023). Pelatihan kader tentang penjaringan kehamilan resiko tinggi dalam upaya peningkatan kualitas antenatal care. *Jurnal Kreativitas Pengabdian Kepada Masyarakat (PKM)*, *6*(2), 731–741. https://doi.org/10.33024/jkpm.v6i2.8229

Silaen, M., Rahayu, S., Aryanti, I., & Prasetyo, A. (2025). Health and socio-economic factors as determinants of antenatal care service access in Indonesia. *Annals of Global Health*, *33*(100099), 1–8. https://doi.org/10.1016/j.cegh.2025.102010

Sumarni, T. (2022). Hubungan Sikap , Akses Informasi dan Jarak Fasilitas Kesehatan Terhadap Pemilihan Tenaga Pertolongan Persalinan. *SIMFISIS Jurnal Kebidanan Indonesia*, *2*(1), 270–275. https://doi.org/10.53801/sjki.v2i1.66

Tunny, R., & Astuti, A. D. (2022). Faktor – faktor yang Mempengaruhi Kunjungan Antenatal Care (ANC) pada Ibu Hamil di Puskesmas Rijali Kota Ambon. *Jurnal Ilmu Kedokteran dan Kesehatan Indonesia (JIKKI)*, *2*(1), 153–162. https://doi.org/10.55606/jikki.v2i1.1165

WHO. (2022). *WHO recommendations on antenatal care for a positive pregnancy experience*. World Health Organization.

WHO. (2022). WHO Statement on Caesarean Section Rates. *The Lancet Global Health*. https://doi.org/10.1016/S2214-109X(22)00022-5

WHO. (2023). *Maternal mortality*. https://www.who.int/news-room/fact-

sheets/detail/maternal-mortality

WHO. (2023). *Trends in maternal mortality: 2000 to 2023 – Estimates by WHO, UNICEF, UNFPA, World Bank Group, and UNDESA/Population Division*. World Health Organization. https://www.who.int/publications/i/item/9789240078909

Winda, I., Hadayani, L., Lestari, Y. P., & Mulia, U. S. (2024). Analisis ketercapaian kunjungan anc di wilayah kerja uptd puskesmas telaga pulang. *Midwifery and Complementary Care*, *3*(1), 1–7. https://doi.org/10.33859/mcc.v3i1.470

Wulandari, R. D., Laksono, A. D., & Rohmah, N. (2021). Urban-rural disparities of antenatal care in Southeast Asia: A case study in the Philippines and Indonesia. *BMC Public Health*, *21*(1121), 1–9. https://doi.org/10.1186/s12889-021-11318-2

Yilmaz, S., Ate, M., & Abay, P. (2025). Adaptation and Psychometric Assessment of the Turkish Version of the Perceived Access to Health Care Questionnaire : Validity and Reliability Analysis. *Healthcare*, *13*(4), 1–21. https://doi.org/10.3390/healthcare13040370