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Determinants of Antenatal Care Utilization at Batua Health Center, Makassar City: A 2024 Study

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ABSTRACT

Introduction: Coverage of antenatal care services visits at Batua Health Centre will fluctuate in 2023. The causal factors include predisposing factors, enabling factors and need factors, our objective was to determine the factors related to the utilization of antenatal care services for pregnant women in the working area of the Batua Health Centre in 2024.
Methods: This research uses a quantitative type of research, with a cross-sectional study approach. The population in this study were all pregnant women who had visited K4 at the Batua Health Center, namely 80 pregnant women. The sample in this study used a total sampling of 80 pregnant women with the sample criteria being pregnant women in the third trimester of pregnancy. The analysis technique uses univariate and bivariate tests in the form of Fisher's exact test using statistical test applications.
Results: This research shows that there is a significant relationship between education ($p=0.039<0.05$), employment ($p=0.003<0.05$), knowledge ($p=0.009<0.05$) and husband's support ($p=0.021<0.05$) with the utilization of antenatal care services for pregnant women in the working area of Batua Health Center in 2024, while there is no significant relationship between age ($p=0.551>0.05$) and accessibility ($p=0.053>0.05$) with utilization of antenatal care services for pregnant women in the working area of the Batua Health Center in 2024.
Conclusion: Education, employment, knowledge, and husband's support play a crucial role in the utilization of ANC services among pregnant women. These findings underscore the importance of targeted interventions, such as community-based maternal health education programs and policies that promote husband involvement in maternal health support. To enhance ANC service coverage and effectiveness, strategic measures should be implemented, including strengthening maternal health awareness programs, providing broader access to health information, and optimizing the role of healthcare workers in encouraging regular ANC visits. The Batua Health Centre is encouraged to collaborate with local policymakers to develop strategies that improve awareness and participation in ANC services, ultimately contributing to better maternal and neonatal health outcomes on a broader scale.

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INTRODUCTION

Indonesia is a developing country that has a fairly high maternal mortality rate. Maternal Mortality Rate (MMR) is an indicator for determining the level of health in a country (1). Globally, the MMR reaches 500,000 people per year (2). The World Health Organization (WHO) in 2019 estimated that the ASEAN region was classified as the region with the highest MMR in the world with a total of around 170,000 maternal deaths per year and 98% occurred in Indonesia, Bangladesh, Nepal and Myanmar (3). The high number of maternal deaths is caused by unequal access to adequate and quality health services as well as economic and social disparities (4).

The maternal mortality rate is one of the Sustainable Development Goals (SDGs) targets which has not yet been achieved, where the SDGs target is to reduce the maternal mortality rate to below 70 per 100,000 live births in 2023 (5). The maternal mortality rate in Indonesia in 2023. 2018-2021 continues to increase (6). In 2018 the maternal mortality rate reached 4,226 cases, while in 2021 it reached 7,389 cases (7).

Deaths among pregnant women in South Sulawesi Province in 2022 reached 174 cases and decreased by 21 cases from 2021 which had 195 cases. Based on districts/cities, the highest number of maternal deaths was in the city of Makassar with a total of 21 deaths (8). Maternal death can be divided into two, namely direct death and indirect death (9). Direct obstetric deaths are deaths caused by obstetric complications that occur during pregnancy, childbirth or postpartum, while indirect obstetric deaths are deaths caused by diseases that occurred before pregnancy or diseases that arise during pregnancy and are exacerbated by the physiological effects of pregnancy (10). Therefore, efforts need to be made to accelerate the reduction in Maternal Mortality Rate (MMR), one of which is by carrying out Antenatal Care (ANC) examinations (11).

Antenatal Care (ANC) is care for pregnant women which is useful for caring for and maintaining the health of the mother and baby periodically (12). Based on the 2020-2024 National Medium Term Development Plan (RPJMN) in 2022, the target for coverage of antenatal visits in 2024 is 95%, while in 2023 the target for coverage of antenatal visits will only reach 92%. Based on the 2021 Indonesian Health profile, coverage of K4 pregnant women's health services in Indonesia has reached 88.8% of the 2021 RPJMN target of 85% (13). Coverage of health services for K4 pregnant women in South Sulawesi Province has exceeded the target of 93.4% of the RPJMN target of 85% (7).

Service coverage for K4 pregnant women from 2020 to 2021 in the city of Makassar has decreased, from 97.7% to 92.4%. Then, in 2022 the coverage of services for pregnant women in Makassar City will increase again with a percentage of 94.95% of pregnant women. Based on the profile of the Makassar City Health Service in 2021, there are community health centers that have the lowest percentage of K4 coverage, one of which is Batua Community Health Center (49%) compared to Maradekaya Community Health Center (63.8%) and Layang Community Health Center (71.0%). Coverage of K4 visits at the Batua Community Health Center in 2022 will increase to 96.33%. Then, in 2023 the coverage of K4 visits will again decrease to 88.87% (14). Data analysis reveals Puskesmas Batua has the lowest coverage of K4 prenatal services compared to other health centers in Makassar. The Indonesian Ministry of Health (2012) reports that there are several factors that influence Antenatal Care visits by pregnant women, namely internal factors and external factors (15). Internal factors include the mother's parity and age, while external factors include the mother's knowledge, attitudes, socio-economic conditions, socio-economic conditions, geography, information and also support, both from staff support and support from the mother's family (16). Based on this description, the researcher wants to research further on the factors related to the use of Antenatal Care Services for Pregnant Women in the Batua Community Health Center Working Area, Makassar City in 2024.

Referring to the persistently high maternal mortality rate (MMR) in Indonesia, which remains a challenge in achieving the Sustainable Development Goals (SDGs), as well as the fluctuating coverage of antenatal care (ANC) visits in various regions, including Batua Health Center, this study aims to identify the factors associated with the utilization of ANC services among pregnant women in the working area of Batua Health Center, Makassar City, in 2024. Specifically, this study seeks to answer the question: "What factors influence the utilization of antenatal care (ANC) services among pregnant women at Batua Health Center?" As a hypothesis, it is assumed that internal factors such as maternal age and parity, as well as external factors including education level, employment status, maternal knowledge, husband’s support, accessibility, and socioeconomic conditions, have a significant relationship with ANC service utilization at Batua Health Center. The findings of this study are expected to serve as a basis for designing more effective policies to improve ANC service coverage, ultimately contributing to the reduction of maternal mortality rates in Indonesia.

METHOD

This type of research is quantitative research with a descriptive analytical approach using a cross sectional research design. This research was conducted in the working area of the Batua Health Center, Manggala District, Makassar City, South Sulawesi. The research was carried out in March-May 2024. The population of this study was the average K4 visit in 2023 at the Batua Community Health Center, namely 80 pregnant women. The collection technique used total sampling, in total 80 samples. The instrument of this research is a questionnaire that has been used, validated, and reliable in previous research, where the knowledge variable uses a questionnaire results by (Rahmah, 2016) and the variable availability of health facilities, accessibility uses a questionnaire by (Awalia, 2022) using the Likert scale and Guttman scale. The collected data is processed using statistical test applications. Data analysis was carried out using univariate and bivariate analysis, namely the Chi-Square test based on the type of factors or variables being measured are unpaired data with a categorical measurement scale. However, processed data results that do not fulfil the Chi-Square test requirements will use the Fisher's exact test. The results of data analysis are then presented in table form.

To control for confounding variables, this study not only applied univariate and bivariate analyses but also planned multivariate analysis to account for factors that could influence the relationship between the main variables. Standardized data collection procedures were implemented to minimize potential bias, with trained enumerators ensuring consistency in the data collection process. All participants were provided with clear information about the study and gave their consent through informed consent procedures. Confidentiality of respondents' data was strictly maintained to protect their privacy. These measures were taken to enhance the validity and reliability of the study results while ensuring adherence to established ethical research standards.

Ethical Consideration

This study has not yet received approval from the Ethics Committee. However, it has been conducted in accordance with the Declaration of Helsinki and the applicable research ethical guidelines in Indonesia. During the data collection process, each participant was provided with sufficient information regarding the study's objectives, including the research methods, expected benefits, and potential risks. Participation in this study was entirely voluntary, without any coercion, and those who agreed to participate gave their verbal consent after receiving an explanation about the study. Furthermore, the confidentiality and anonymity of participants' data were ensured, meaning that no personal information would be shared or used beyond the scope of the study. Moving forward, the researchers will submit the necessary documents to the relevant committee to obtain ethical clearance and comply with other ethical research requirements.

RESULTS

Descriptive Statistics

Based on table 1, it is known that the majority of respondents were aged 20-35 years, namely 64 (80.0%) respondents and the highest gestational age was 7 months, 41 (51.2%). The majority of respondents' education was high school/high school/equivalent, 44 (55.0%) respondents and the majority of respondents worked as housewives, namely 65 (81.3%) respondents.

Table 1. Characteristics of Respondents Based on Age, Gestational Age, Education and Occupation at Batua Community Health Center in 2024

No	Variable	Frequency	%
1	**Age**		
	20-35 years old	64	80,0
	<20 years old	1	1,3
	>35 years old	2	18,8
2	**Gestational age**		
	7 months	41	51,2
	8 months	25	31,3
	9 months	15	17,5

	Educational Level		
	Elementary School	3	3,8
3	Junior High School	16	20,0
	Senior High School	44	55,0
	College	17	21,3
	Occupation		
	Private Employees/Entrepreneurs	11	13,8
4	Civil servants/honorary staff/teachers	3	3,8
	Housewife	65	81,3
	Laborer	1	1,3
	Total	80	100,0

Source: Primary Data, 2024

Based on table 2, it is known that from the bivariate analysis the majority of respondents have fully utilized the antenatal care services at the Batua Community Health Center, namely 60 (75.0%) respondents. Most of the respondents were in the low risk age category (20-35 years), namely 65 (813%) respondents. The majority of respondents had a high level of education, namely 61 (76.3%) respondents. The majority of respondents did not work, namely 65 (81.3%) respondents. Based on the knowledge variable, it is known that the majority of respondents have sufficient knowledge, namely 73 (91.3%) respondents. Then, in the husband's support variable, it is known that the majority of respondents received husband's support, namely 72 (90.0%) respondents. As for the accessibility variable, the majority of respondents stated that they had easy access, namely 74 (92.5%) respondents.

Table 2. Distribution of Respondents Based on Utilization of Antenatal Care Services, Age, Education, Employment, Knowledge, Husband's Support, Accessibility

No	Variable	Frequency	%
	Utilization of Antenatal Care		
1	**Services** Complete	60	75,0
	Incomplete	20	25,0
	Age		
2	Low Risk (20-35 years)	65	81,3
	High Risk (< 20 and > 35 years)	15	18,8
	Education		
3	High	61	76,3
	Low	19	23,8
	Work Status		
4	Worker	15	18,8
	Not Workers	65	81,3
	Knowledge		
5	Enough	73	91,3
	Not enough	7	8,8
	Husband's Support		
6	Supportive	72	90,0
	Less Supportive	8	10,0
	Accessibility		
7	Easy	74	92,5
	Hard	6	7,5
	Total	80	100,0

Source: Primary Data, 2024

Primary Outcome Measures

The results of the bivariate analysis using Fisher's exact test to determine the correlation between two variables in the study are as follows. The bivariate analysis in Table 3 shows that for the age variable, the p-value is 0.551, indicating no relationship between age and the utilization of antenatal care among pregnant women in the

working area of Batua Health Center in 2024. The Fisher's exact test for the education variable showed a p-value of 0.003, meaning there is a significant relationship between education and the utilization of antenatal care services among pregnant women in the working area of Batua Health Center in 2024. Furthermore, the Fisher's exact test for the employment variable showed a p-value of 0.039, indicating a significant relationship between employment and the utilization of antenatal care services among pregnant women in the working area of Batua Health Center in 2024. The results for the knowledge variable from the Fisher's exact test showed a p-value of 0.009, suggesting a significant relationship between knowledge and the utilization of antenatal care services among pregnant women in the working area of Batua Health Center in 2024.

The bivariate analysis using Fisher's exact test for the husband's support variable showed a p-value of 0.021, indicating a significant relationship between husband's support and the utilization of antenatal care services among pregnant women in the working area of Batua Health Center in 2024. Finally, for the accessibility variable, the Fisher's exact test showed a p-value of 0.530, meaning there is no relationship between accessibility and the utilization of antenatal care services among pregnant women in the working area of Batua Health Center in 2024.

Table 3. Bivariate Analysis of Independent Variables and the Utilization of Antenatal Care Services Among Pregnant Women in the Working Area of Batua Health Center in 2024.

Characteristics	Utilization of Antenatal Care Services				Total		P
	Complete		Incomplete				
	n	%	n	%	n	%	
Age							
Low Risk (20-35 years)	49	61,3	16	20,0	65	81,3	0,551
High Risk (< 20 and > 35 years)	11	13,8	4	5,0	15	18,8	
Education							
High	9	11,3	10	12,5	19	23,8	0,003
Low	51	63,5	10	12,5	61	76,3	
Work Status							
Worker	8	10,0	7	8,8	15	18,8	0,039
Not Workers	52	65,0	13	16,3	65	81,3	
Knowledge							
Enough	58	72,5	15	18,8	73	91,3	0,009
Not enough	2	2,5	5	6,3	7	8,8	
Husband's Support							
Supportive	57	71,3	15	18,8	72	90,0	0,021
Less Supportive	3	3,8	5	6,3	8	10,0	
Accessibility							
Easy	55	68,8	19	23,8	74	92,5	0,530
Hard	5	6,3	1	1,3	6	7,5	
Total	**60**	**75,0**	**20**	**25,0**	**80**	**100,0**	

Source: Primary Data, 2024

The bivariate analysis results indicate no significant relationship between maternal age and the utilization of antenatal care (ANC) services (p = 0.551), suggesting that both low-risk and high-risk age groups have relatively similar ANC visit patterns. However, there is a significant relationship between education level (p = 0.003), employment status (p = 0.039), knowledge level (p = 0.009), and husband's support (p = 0.021) with ANC utilization. Mothers with lower education levels were more likely to complete ANC visits compared to those with higher education, while unemployed mothers were more likely to utilize ANC services compared to employed mothers. Additionally, mothers with sufficient knowledge were more likely to complete ANC visits than those with limited knowledge. Husband's support also played a crucial role, as mothers who received support from their spouses were more likely to complete ANC visits than those who lacked such support. Conversely, healthcare accessibility did not show a significant relationship with ANC utilization (p = 0.530), indicating that ease of access to healthcare facilities does not always guarantee complete ANC visits. Overall, education level, employment status, knowledge, and

husband's support emerged as the key factors influencing ANC service utilization in the working area of Batua Health Center

DISCUSSION

Interpretation of Key Findings

Age can influence maternal health, and the ideal age for pregnancy is considered to be between 20 and 35 years (17). Biologically, women in this age group are more prepared for pregnancy, as their organs are fully developed (18). Psychologically, women in this age range are also more capable of making logical decisions, such as deciding to seek early prenatal care (19). The results of the Fisher's exact test showed a p-value of 0.551, or $p > 0.05$, indicating no significant relationship between age and the utilization of antenatal care services. This is consistent with the study by Cahyani (2020), which found no significant relationship between age and the utilization of antenatal care services, with a p-value of 0.168 or $p > 0.05$ (20). However, this study contrasts with the research by Adedokun & Yaya (2020), which found a significant relationship between age and the utilization of antenatal care services, with a p-value of 0.01 or $p < 0.05$ (21). This research shows that there is a significant gap in the utilization of antenatal services between low risk and high risk pregnant women caused by a lack of awareness of the importance of pregnancy checks. These findings corroborate Safari er al. (2023), emphasized that age is not a reliable predictor of utilization of antenatal services, because limited knowledge, symptoms and information about pregnancy checks contribute to maternal indefference.

Education plays a crucial role in promoting public health awareness. Individuals with higher levels of education tend to view health as an important matter, and as a result, they are more likely to utilize healthcare services compared to those with lower levels of education (22). Based on the Fisher's exact test results in this study, the p-value was 0.003, or $p < 0.05$, indicating a significant relationship between education level and the utilization of antenatal care services among pregnant women in the working area of Batua Health Center. This finding aligns with the research conducted by Wijaya et al. (2022), which identified a significant relationship between the education level of pregnant women and the regularity of antenatal care (ANC) visits at Helvetia Health Center, with a p-value of 0.028 ($p < 0.05$) (23). However, this study differs from the research by Nurfitriyani (2022), which found no significant relationship between education and the utilization of ANC services at Blooto Health Center in Mojokerto, with a p-value of 0.160 or $p > 0.05$.

The results of the Fisher's Exact Test analysis in this study show a p-value of 0.009 or $p < 0.05$, indicating a significant relationship between employment and the utilization of antenatal care services among pregnant women in the working area of Puskesmas Batua. This finding is consistent with the study by Loda et al. (2022), which found a significant relationship between employment and the utilization of antenatal care services, with a p-value of 0.006 or $p < 0.05$. The study suggested that housewives are more likely to utilize antenatal care services compared to employed women, as housewives typically have more time to attend check-ups. Employed women, on the other hand, often prioritize work over seeking antenatal care. However, this study does not align with the research by Alviani (2021), which found no significant effect of employment on the utilization of antenatal care services in the working area of Puskesmas Galang, with a p-value of 0.354 or $p > 0.05$.

Based on the results of the bivariate analysis, the Fisher's Exact Test revealed a p-value of 0.009 or $p < 0.05$, indicating a significant relationship between knowledge and the utilization of antenatal care services among pregnant women in the working area of Puskesmas Batua. This is in line with the study by Fransiska (2021), which reported a p-value of 0.000 from a chi-square test, suggesting a significant relationship between maternal knowledge and regular antenatal care visits. This relationship can be explained by the fact that a respondent's knowledge influences their mindset and ability to absorb information, leading to behavioral changes that encourage regular attendance at antenatal care visits. However, this study contradicts the findings of Barus et al. (2020), which showed no significant relationship between knowledge and the utilization of antenatal care services, with a p-value of 0.574 or $p > 0.05$. Maternal knowledge about the importance of prenatal check-ups can significantly influence a pregnant woman's willingness to seek care at health facilities. The higher the level of knowledge, the more likely the individual is to take advantage of available healthcare services (24). The majority of pregnant women who utilize antenatal care services at Puskesmas Batua had low knowledge about the recommended number of iron supplementation tablets to be consumed during pregnancy. Respondents believed that only 30 tablets were necessary during the pregnancy.

The results of the bivariate test using Fisher's exact test analysis show that the p value = 0.31 or p value < 0.05, meaning that there is a significant relationship between husband's support and the use of antenatal care services for pregnant women in the Batua Health Center working area. This shows that not all mothers who receive husband's support can utilize complete antenatal care services, conversely not all mothers who lack husband's support do not utilize complete antenatal care services. This research is in line with research by Taolin (2022) which states that there is a significant relationship between husband's support and ANC visits for pregnant women with a p value = 0.000 or a p value < 0.05. Husband's support has an important role in providing psychological influence and motivation for pregnant women to implement health behavior. Husband's support can be in the form of attitudes and actions provided such as assistance, attention, appreciation or concern for pregnant women. Husband's support can have a good impact on mothers in utilizing antenatal care services regularly to reduce risks that can occur during pregnancy and during childbirth (25). In this study, mothers who do not work tend to utilize antenatal care services compared to mothers who work.

Based on the results of the bivariate test using Fisher's exact test, the p value = 0.530 or p value > 0.05. This means that there is no significant relationship between accessibility and the use of antenatal care services for pregnant women in the Batua Community Health Center working area. The results of this research show that the majority of respondents have a residence distance of 1-5 km and it takes less than 30 minutes to get to the Batua Health Center, so it can be concluded that the accessibility of the Batua Health Center is easy to reach. This research is in line with research (Cahyani, 2020) which obtained a p value = 1.000 or a p value > 0.05, which means that there is no significant relationship between accessibility and the use of antenatal care services at the Trucuk I Health Center, Klaten Regency. Accessibility is measured based on the distance and travel time required and supported by transportation facilities and infrastructure to reach health service facilities and is not hampered by geographic conditions or other physical obstacles. Even though ANC services are close, travel time is short and transportation costs are affordable, there are still pregnant women who do not use antenatal care services because they feel they do not need ANC services. This is in accordance with research by Andersen (2005) which states that one of the factors that has an influence on health service utilization behavior is perceived need (20).

Cultural and socio-economic factors play a significant role in influencing the relationship between maternal characteristics and the utilization of antenatal care (ANC) services. Social norms and beliefs regarding pregnancy and healthcare can determine whether a pregnant woman accesses ANC regularly. In some communities, there is still a perception that antenatal check-ups are not always necessary, leading expectant mothers to rely more on advice from elders or non-medical practitioners such as traditional birth attendants. Additionally, economic conditions can act as a barrier to accessing healthcare services, particularly for women from low-income families who prioritize basic needs over healthcare expenses, even when ANC services are available. Gender roles also play a crucial role, as a husband's involvement in maternal healthcare is often shaped by cultural norms. In patriarchal societies, women may have limited autonomy in making healthcare decisions, making spousal or family support a key factor in ANC utilization. Employment status further influences ANC use, as working mothers often face time constraints and work commitments that hinder their ability to attend healthcare visits, especially if their workplace does not provide flexibility for pregnant employees. Although access to healthcare facilities was not identified as a major barrier in this study, socio-economic disparities and cultural perceptions of maternal healthcare needs still affect health-seeking behaviors. Therefore, culturally tailored health education programs, financial support for vulnerable groups, and community-based interventions are essential to improving ANC utilization and overall maternal health outcomes.

CONCLUSION

Based on the research findings, education, employment, knowledge, and husband's support have a significant relationship with the utilization of antenatal care (ANC) services among pregnant women in the working area of Batua Health Center in 2024, while age and accessibility do not show a significant relationship. To improve attendance in ANC services, several targeted strategies are needed, such as community-based awareness campaigns to educate pregnant women and their families, especially husbands, about the importance of regular ANC visits through health centers, religious gatherings, and social media to expand the reach of education. Additionally, policy interventions can be implemented by increasing workplace flexibility for pregnant women, such as allowing leave without salary deductions for ANC visits, as well as providing incentives for low-income families, such as transportation subsidies or free ANC services. Furthermore, collaboration with community leaders and traditional

birth attendants can help bridge cultural gaps and dispel misconceptions related to maternal healthcare. By implementing these strategies, it is expected that ANC attendance among pregnant women will increase significantly, thereby minimizing maternal health risks and improving pregnancy outcomes in the working area of Batua Health Center.

AUTHOR'S CONTRIBUTION STATEMENT

All authors significantly contributed to this research. St. Rosmanely was responsible for conceptualizing the study, designing the research framework, and overseeing data collection. Nurhayani conducted the literature review, assisted in data analysis, and contributed to drafting the manuscript. Muhammad Alwy Arifin played a key role in refining the methodology, performing statistical analysis, and reviewing the findings. Zaskiah managed the ethical approval process, ensured data accuracy, and provided final revisions before submission. All authors reviewed and approved the final manuscript, guaranteeing its quality and integrity.

CONFLICTS OF INTEREST

The authors recognize that some contributors to this manuscript also serve in editorial roles at the journal to which it is being submitted. To uphold transparency and preserve the integrity of the editorial process, the peer review and decision-making for this manuscript have been carried out independently, without any involvement or influence from the authors in their editorial capacities. This approach guarantees the impartiality and credibility of the review process.

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