

The relationship between the ratio of midwives and antenatal care coverage in Central Kalimantan in 2020-2022

Dhea Sofiana Mellazulfa¹, Rachmad Suhanda^{2*}, Sigit Nurfianto³

1. Yasmin Mother and Child Hospital, Palangkaraya, Indonesia
2. Department of Public Health and Community Medicine, Faculty of Medicine, Universitas Syiah Kuala, Banda Aceh, Indonesia
3. Department of Obstetrics and Gynecology: Faculty of Medicine, Palangkaraya University. RSUD dr. Doris Sylvanus, Palangkaraya, Indonesia

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ABSTRACT

Introduction : Antenatal care (ANC) is a healthcare service for pregnant women. The quality of health services is heavily influenced by the performance of the health workers, including midwives. In Central Kalimantan, in 2021, the first ANC coverage (K1) achieved 98.15%, while the fourth coverage (K4) was at 88.14%. Four districts/cities in Central Kalimantan had public health centers with midwife ratios below the minimum requirement (130 midwives per 100,000 population). The purpose of the study was to determine the relationship between the ratio of midwives and the ANC coverage in Central Kalimantan in 2020–2022.

Methods : The data was analyzed using the cross-sectional study design. The dependent variable was the ANC coverage in Central Kalimantan in 2020–2022, while the independent variable was the ratio of midwives in Central Kalimantan in 2020–2022.

Results : In Central Kalimantan, 10 (71.4%) districts had achieved the target midwife ratio, while 4 (28.6%) had not. There had been a yearly decrease from K1 to K4. Despite positive growth in midwife ratios, there was no significant correlation between midwife ratios and ANC coverage for both K1 and K4.

Conclusion : The ratio of midwives had not significantly contributed to the coverage of ANC K1 and K4 in Central Kalimantan. Various factors that could impact the ANC coverage, aside from human resources, must be taken into account. It is crucial for the government to expand its involvement.

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INTRODUCTION

Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR) are crucial indicators for measuring a country's welfare and the health condition of its population. In pursuit of reducing the MMR, since 1990, the Indonesian government has implemented various measures, including Antenatal Care (ANC) health services for pregnant mothers (Setiyawaty et al., 2022). Adequate maternal health status can significantly contribute to the overall health of communities, individuals, and future generations (European Board & College Obstetrics and Gynaecology, 2015).

*Corresponding author

E-mail address: rachmadsuhanda@usk.ac.id

According to the World Health Organization (WHO), antenatal care is a special service for pregnant women provided by skilled healthcare professionals. The components of ANC comprise risk identification, prevention and management of pregnancy-related and other diseases that may arise during pregnancy, and health education as well as promotion (World Health Organization, 2016). ANC services should be conducted according to established standards (Wulandari et al., 2017). Integrated antenatal care is a thorough and high-quality service that can be provided by medical professionals, such as doctors, midwives, and nurses (Mikrajab & Rachmawati, 2016).

The minimum frequency of ANC services that pregnant women should receive is six antenatal check-ups, where at least two of them are conducted by a medical doctor (Kementerian Kesehatan Republik Indonesia, 2018). In an effort to improve the quality of maternal and child health, the performance of midwives as maternal and neonatal health service providers will have an impact on the quality of health services. MMR and IMR can be reduced if a woman can go through the process of pregnancy, childbirth and postpartum safely (Wagiyo & Putrono, 2016). In reality, not all pregnant women make regular ANC visits. This results in low K1 and K4 coverage (Yonni Siwi & Saputro, 2020). The low coverage of K1 (the first visit to healthcare services for pregnant mothers in their first trimester) and K4 (the pregnancy check-up visits which is done four times during the pregnancy consists of one visit in the first trimester, one visit during the second trimester, and two visits during the third trimester) causes risk factors in pregnant women cannot be detected early (Kementerian Kesehatan Republik Indonesia, 2018).

The 2021 Indonesian National Medium-Term Development Plan or also known as Rencana Pembangunan *Jangka Menengah Nasional* (RPJMN) target for ANC K4 service coverage was 85%. Based on the routine data reporting, the national coverage for ANC services in 2021 was 88.13%. Some provinces in Indonesia have achieved the objective of meeting the ANC K4 service performance target outlined in the 2021 RPJMN, while others have not. Although the national coverage indicator for ANC visits has been attained, 17 provinces still have not met the target. Two of those provinces are West Papua and Papua with the coverage below 40% (Setiyawaty et al., 2022).

According to the 2021 report from the Central Kalimantan Provincial Health Office, there was a decrease in the coverage of ANC K1 from 98.15% to 88.14% in K4 (Dinas Kesehatan Provinsi Kalimantan Tengah, 2021). The data sourced from the Directorate General of Public Health, Ministry of Health of the Republic of Indonesia also shows a decrease in the K1 rate from 112.6% to 88.1% in K4. As of 2021, the majority of provinces in Indonesia have less than the minimum standard (80%) of midwife availability at the public health centers. At least four midwives must be present in non-inpatient public health centers, and seven in inpatient public health centers. This condition applies in urban, rural, and remote and very remote areas (Kementerian Kesehatan Republik Indonesia, 2022). Indonesia boasts a large number of midwives. However, their distribution remains uneven, particularly in underdeveloped border and island areas or also known as Daerah Tertinggal Perbatasan dan Kepulauan (DTPK). This inequality is evident from the fact that there are numerous health centers that do not meet the standard number of midwives as their staff (Direktorat Perencanaan Tenaga Kesehatan, 2022).

In Central Kalimantan, there were 3278 midwives employed at the public health center in 2021. However, some public health centers are still lacking midwives, resulting in a total shortage of 11 midwives (Dinas Kesehatan Provinsi Kalimantan Tengah, 2021). Given the significant impact of ANC quality on reducing maternal and infant mortality rates, the researchers aimed to conduct

further analysis on the factors that influence the ratio of midwives to ANC coverage in Central Kalimantan Province in 2020–2022.

METHODS & MATERIALS

This study used a cross-sectional study design, which was an observational epidemiological study that examined the prevalence, distribution, and association of disease and exposure by simultaneously observing exposure status, disease, or other outcomes in individuals from a population at one time. Cross-sectional in its simplest interpretation was: an epidemiological study that measured several variables at the same time.

This study investigated the correlation between the number of midwives and the coverage of ANC K1 and K4 in Central Kalimantan in 2020–2022. The ANC coverage in Central Kalimantan during 2020–2022 served as the dependent variable, while the ratio of midwives in Central Kalimantan during 2020–2022 served as the independent variable. The data used was secondary data, which was the information collected and documented by an external party for a purpose other than this research. The study's data originated from the 2020–2022 Central Kalimantan Provincial Health Human Resources Description report, published by the Central Kalimantan Provincial Health Office.

RESULT

At least four midwives are required in non-residential health centers and at least seven in inpatient health centers, across urban, rural, remote and very remote areas. According to the Decree of The Indonesian Coordinating Ministry for Human Development and Cultural Affairs No. 54/2013 for 2025 Target, the optimal ratio of midwives is 130 per 100,000 population.

Table 1. Number and ratio of midwives per 100,000 population by regency/city in Central Kalimantan in 2020–2022

No.	District/City	2020		2021		2022	
		NoM	MR	NoM	MR	NoM	MR
1	West Kotawaringin	264	97.64	249	91.37	251	91.29
2	East Kotawaringin	288	67.15	330	76.34	349	80.03
3	Kapuas	445	108.42	444	106.68	454	107.28
4	South Barito	194	147.93	207	157.29	244	184.85
5	North Barito	242	156.32	269	171.09	285	177.86
6	Sukamara	86	135.51	88	135.51	89	133.14
7	Lamandau	149	152.65	148	147.21	156	149.44
8	Seruyan	211	129.52	211	128.36	262	157.76
9	Katingan	232	143.01	251	153.89	275	167.69
10	Pulang Pisau	202	150.19	204	150.74	240	176.18
11	Gunung Mas	192	141.83	221	159.67	241	169.35
12	East Barito	196	173.10	214	187.32	209	181.10
13	Murung Raya	245	219.68	258	229.45	285	251.14
14	Palangka Raya	183	62.36	184	61.55	185	60.48
Total		3129	117.19	3278	121.31	3525	128.60

* NoM: Number of Midwife; MR: Midwife Ratio

In 2020–2022, several districts in Central Kalimantan had achieved the ideal midwife ratio. These districts were South Barito, North Barito, Sukamara, Lamandau, Katingan, Pulang Pisau, Gunung Mas, East Barito, and Murung Raya. However, certain regencies and cities in Central Kalimantan had yet to reach the recommended midwife-to-patient ratio. Palangka Raya was a city that had less than the ideal ratio of midwives, with 62.36, 61.55, and 60.48 midwives per 100,000 population in 2020, 2021, and 2022 respectively. In addition to Palangka Raya, West Kotawaringin, East Kotawaringin, Kapuas, and Seruyan were also districts/cities with inadequate midwife ratios. Several districts had exhibited promising growth in their midwife ratio, specifically South Barito, North Barito, Katingan, Gunung Mas, and Murung Raya. In these districts, the midwife ratio had increased annually between 2020 to 2022 in multiple regions.

Table 2. Coverage of ANC K1 and K4 in Central Kalimantan in 2020–2022

No.	District/City	K1			K4		
		2020	2021	2022	2020	2021	2022
1	West Kotawaringin	94.50%	96.70%	90.43%	86.10%	92.75%	81.30%
2	East Kotawaringin	93.20%	110.57%	110.09%	85.00%	92.40%	89.23%
3	Kapuas	95.90%	99.56%	99.56%	95.90%	93.52%	96.14%
4	South Barito	74.60%	87.20%	83.77%	69.80%	38.81%	65.69%
5	North Barito	97.50%	105.46%	105.38%	90.40%	96.79%	94.71%
6	Sukamara	87.80%	97.59%	101.34%	85.80%	92.21%	97.71%
7	Lamandau	98.40%	104.10%	99.00%	87.80%	89.42%	92.21%
8	Seruyan	85.20%	89.91%	102.53%	62.60%	83.81%	86.81%
9	Katingan	87.50%	86.24%	109.16%	79.20%	87.41%	83.72%
10	Pulang Pisau	95.80%	97.32%	98.63%	87.60%	93.03%	92.44%
11	Gunung Mas	90.40%	97.15%	98.77%	84.00%	92.84%	94.81%
12	East Barito	78.20%	96.77%	87.58%	68.20%	87.10%	80.16%
13	Murung Raya	79.00%	94.23%	99.00%	70.80%	83.99%	77.30%
14	Palangka Raya	86.50%	95.80%	99.78%	78.10%	90.21%	99.78%
Total		89.80%	98.15%	100.12%	81.70%	88.14%	88.45%

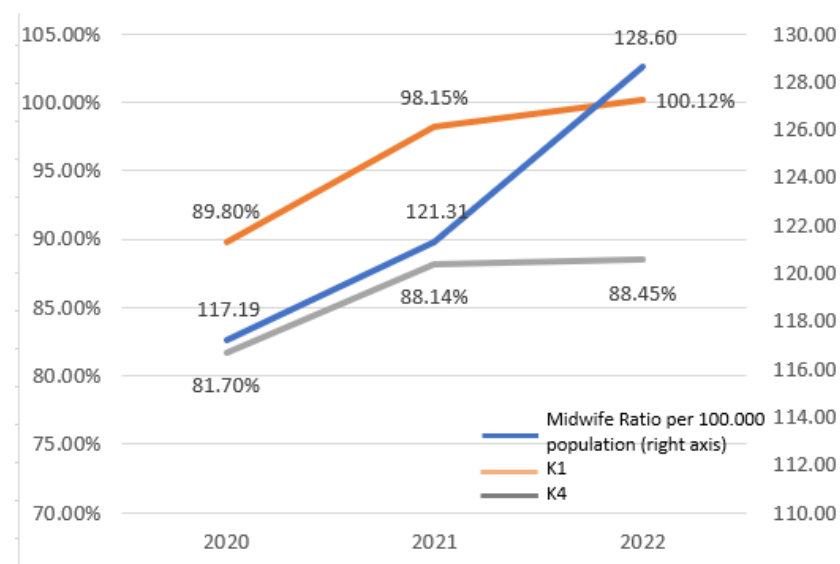


Figure 1. Central Kalimantan midwife ratio chart and ANC K1 & K4 coverages in 2020–2022

Some of the 34 provinces in Indonesia have achieved the 2021 Indonesian National Medium-Term Development Plan target (85%) while others have not. Central Kalimantan had attained the national target, but there had been a decrease in the percentage of ANC services in K1 and K4. According to the table above, in 2020, the K1 coverage data was 89.8% which later decreased to 81.7% for K4. In 2021, the coverage data for K1 was 98.15 % and it decreased to 88.14 % for K4. In 2022, the K1 coverage was 100.12%, whereas for K4 it was 88.45%. There had been a consistent decrease in the percentage of ANC coverage from K1 to K4 each year in Central Kalimantan.

Based on the data acquired by the researchers, the relationship between the midwife ratio and the coverage of ANC K1 and K4 in Central Kalimantan throughout 2020–2022 can be seen in the following Figure 1.

There was no association between positive growth in the midwife ratio and ANC K1 and K4 coverage. In 2021–2022, the coverage of ANC K4 declined, indicating that the growth in the midwife ratio that took place during that period did not result in any increase in the percentage of K4 coverages in Central Kalimantan. Aside from the number of midwives, the coverage of ANC K1 and K4 also depend on other factors.

Table 3. Analysis of the relationship between midwife ratio and ANC K1 and K4 coverage in 2020–2022

Midwife Ratio	K1		K4	
	p	r	p	r
Year 2020	0.204*	-0.362*	0.276*	-0.313*
Year 2021	0.359*	-0.266*	0.523**	-0.187**
Year 2022	0.518*	-0.189*	0.081*	-0.481*

* Pearson correlation

** Spearman's rho

After conducting a bivariate analysis of the relationship between the midwife ratio and coverage of ANC K1 and K4 in 2020, the significance value for midwife ratio and K1 was $p = 0.204$ (p value > 0.05), while the significance value for midwife ratio and K4 was $p = 0.276$ (> 0.05). In 2021, the relationship between midwife ratio and K1 score was recorded at $p = 0.359$ and K4 was recorded at $p = 0.523$. In 2022, K1 was obtained at $p = 0.518$ and K4 was obtained at $p = 0.081$. It can be stated that there was no significant relationship between the number of midwife ratio and the coverage of ANC K1 and K4 in 2020–2022 in Central Kalimantan.

DISCUSSION

Using bivariate analysis, it was found that the Pearson correlation test failed to establish a significant relationship between the ratio of midwives and the coverage of ANC K1 and K4 in 2020, with significance values of $p = 0.204$ (> 0.05) for K1 and $p = 0.276$ (> 0.05) for K4. For the 2021 data, both the Pearson test and Spearman's rho test were conducted, and they also failed to establish any meaningful relationship between the ratio of midwives, where the value for K1 was $p = 0.359$ and the value for K4 was $p = 0.523$. In 2022, the ratio of midwives and K1 was subjected to a Pearson correlation test, resulting in a significant value of $p = 0.518$ and $p = 0.081$ for K4. Based on the results of the bivariate analysis of the correlation between the midwife ratio and the coverage of ANC K1 and K4 in Central Kalimantan, it can be concluded that there was no

relationship between the two variables for the years of 2020–2022, as the probability (p) exceeds 0.05.

In 2020, the Pearson correlation test showed that there was a negative correlation between midwife ratio and ANC coverage, represented by the number of -362 at K1 and -313 at K4. The Pearson correlation for midwife ratios and K1 also showed a negative correlation of -266 in 2021, while the Spearman correlation for midwife ratios and K4 indicated a negative correlation of -187, with negative correlations of -189 at K1 and -481 at K4 for 2022. The negative value suggested that the correlation between midwife ratio and the coverage of ANC K1 and K4 was not linear. Consequently, the ANC coverage was not influenced by the midwife ratio. If the relationship between two variables was not linear, then the Pearson correlation coefficient did not reflect the strength of the relationship between the two variables being studied, even though the two variables had a strong relationship. This correlation coefficient is called the Pearson correlation coefficient since it was first introduced by Karl Pearson in 1990 (Firdaus, 2009).

Green (1984) proposed that ANC coverage rates are influenced by both behavior and non-behavior causes. Behavior causes can be further divided into predisposing, enabling, and reinforcing factors (Green, 1984). The predisposing factors include maternal age, parity, birth spacing, education, and attitudes. The enabling factors include employment, family finances, cost, availability of services, distance, and time. The factors of need include medical history, symptoms, health perception, maternal condition, treatment plan, and hemoglobin level (Wibowo, 1992).

The three delays that may result in maternal mortality are a late decision to seek medical assistance, late recognition of and accessibility to healthcare, and a delayed search for appropriate and effective care (Masturoh et al., 2018). Predisposing factors are conditions that encourage change in an individual's actions. These factors include the community's level of education, health-related knowledge and attitudes, as well as their traditions and beliefs regarding health matters, socio-economic status, and the community's adopted values (Djannah et al., 2020). Predisposing factors comprise age, education level, occupation, parity, knowledge, and attitudes of pregnant women. Enabling factors comprise residential distance, household income, and accessible information media facilities. Reinforcing factors are namely spousal and familial support, as well as attitudes and encouragement from healthcare personnel (Rachmawati et al., 2017).

The increasing ratio of midwives was not accompanied by an even distribution of midwives for each district or city, so the attitude and support of health workers were still not maximized. Access to healthcare workers was hindered due to their limited availability on specific days. In Central Kalimantan, the burden on employee budgeting had not been able to fulfill the health workers' needs as a whole, especially at district/city level (Dinas Kesehatan Provinsi Kalimantan Tengah, 2021).

Furthermore, the responsibilities allocated to midwives may have an impact on the coverage of ANC. According to Regulation of the Minister of Health (Permenkes) Number 1464/Menkes/Per/X/2010 about Midwife Practices' Permits and Implementation, midwives possess several authorities, including normative authority encompassing maternal and child health services, women's reproductive health services, and family planning (KB), authority executing government programs, and authority when practicing in areas with no doctors. The duration of working hours and workload undertaken by midwives have a considerable impact on the quality of antenatal care services they offer (Kementerian Kesehatan Republik Indonesia,

2014). Midwives with a high workload tend to provide substandard ANC services (Susanti et al., 2015).

The comprehensive and systematic analysis of ANC data is crucial to detecting and evaluating risks and preventable factors linked with maternal and neonatal mortality throughout all pregnancy stages. In Indonesia, gathering timely, accurate, and complete information regarding pregnancy-related consequences and the effects and causes of interventions remains a challenge. This can hinder program planning, decision-making, and the appropriate allocation of resources to reduce maternal, fetal, and neonatal mortality (Achadi & Jones, 2014). The primary reasons for these gaps are a lack of awareness, high workloads, and insufficient skills and resources (Anggraini et al., 2018).

CONCLUSION

In Central Kalimantan in 2020-2022, West Kotawaringin, East Kotawaringin, Kapuas, Seruyan and Palangkaraya City are districts/cities that had the number of midwives below the ideal ratio. Central Kalimantan's ANC coverage had reached the national target but there was still a decrease in the percentage of ANC coverage K1 & K4. In 2020 the K1 coverage data was 89.8% to 81.7% at K4. In 2021 the K1 coverage data was 98.15% to 88.14% at K4. In 2022 the K1 coverage data was 100.12% to 88.45% at K4. There was a decrease in the percentage of the coverage of ANC K1 to K4 every year. Analysis of the relationship between the ratio of midwives and ANC coverage showed a significance of $p > 0.05$. This indicates that the ratio of midwives had no effect on the coverage of ANC K1 and K4. There are other factors that influenced ANC coverage, including age, education level, occupation, parity, knowledge, attitude, distance of residence, family income, information media facilities, husband support, family support, and support from health workers and government. Government policies are needed to support the adjustment of the number and distribution of midwives according to the needs of each district/city. Furthermore, this support should be equipped with programs and management to implement these policies. Government policy is needed to encourage all provinces to implement ANC. It is necessary to set achievement targets as well as programs and management that support these policies that must be developed and implemented along with monitoring and evaluation. It is necessary to evaluate the performance of midwives, which includes the duties and authority of midwives in midwifery services in order to optimize the functions of midwives to improve ANC coverage.

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