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Analysis of Antenatal Care Implementation in Reducing Maternal and Infant Mortality Rates at Community Health Centers in Medan City

Cut Nasywa Kesuma Dany, Rapotan Hasibuan

Faculty of Public Health, Universitas Islam Negeri Sumatera Utara, North Sumatra Province, Indonesia

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Corresponding Author:
Cut Nasywa Kesuma Dany
Faculty of Public Health, Universitas Islam Negeri Sumatera Utara, North Sumatra Province, Indonesia
Email: cutnasywa1@gmail.com

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Abstract

One of the primary targets of the Sustainable Development Goals (SDGs) 2030 and a key indicator of national development success is the reduction of maternal mortality (MMR). Because maternal health significantly influences the health of the next generation, antenatal care services are utilized to reduce MMR. The purpose of this study was to explore the inputs, processes, and outputs of antenatal care services provided by Community Health Centers (Puskesmas) in Medan City. A qualitative descriptive phenomenological method was employed, generating descriptive data. The study involved two main informants, one key informant, and five triangulation informants. Data were collected through in-depth interviews. The findings revealed that a high level of community preference for specialist services contributed to many cases of maternal and infant mortality as well as a decline in antenatal care visits at Puskesmas. In addition, the study identified the limited effectiveness of ultrasound examinations, which were only conducted once a week. Complaints from patients also emerged regarding the health workers' approach, particularly their responsiveness, focus, and attentiveness, which led many patients to prefer specialists over Puskesmas services. Based on these findings, it is recommended that Puskesmas in Medan City address the issue of overlapping workloads, improve the standardization of supporting facilities, and increase the frequency of ultrasound examinations to twice per week.

Keywords: analysis; antenatal care; implementation; health services

Introduction

The Sustainable Development Goals (SDGs) program is one of the government's initiatives that emphasizes reducing maternal mortality (MMR) and infant mortality (IMR). One of the key indicators of national development success is the improvement of maternal health and the reduction of maternal mortality (Hasnah et al., 2021).

Maternal health, particularly the nutritional status of pregnant and breastfeeding women, has a significant impact on the health of children who will be born as the nation's next generation (UNICEF, 2019). By 2030, Indonesia aims to achieve the 17 SDGs, including reducing the maternal mortality ratio to fewer than 70 per 100,000 live births, decreasing neonatal mortality to at least 12 per 1,000 live births, and lowering under-five mortality to 25 per 1,000 live births (Sustainable Development Goals Center, Universitas Brawijaya, 2024).

According to data from the North Sumatra Provincial Health Office, maternal and infant deaths increased from 119 and 299 cases in 2021 to 124 and 627 cases as of September 2024. The province also set targets for 2024: reducing maternal mortality to 183 per 100,000 live births and infant mortality to 16 per 1,000 live births (DINKES, 2024).

Community health centers (*puskesmas*) serve as the frontline of Indonesia's national health services. As the foundation of primary healthcare delivery, *puskesmas* play a crucial role in achieving national health development goals toward creating a healthier Indonesia (Sulaeman, 2021).

According to the latest WHO standards, pregnant women are expected to receive at least eight antenatal care (ANC) visits. In Indonesia, however, based on professional adjustments and programmatic agreements, pregnant women typically undergo six ANC visits. These include two consultations with physicians during the first trimester for risk factor screening of pregnancy complications, and one consultation in the third trimester for screening delivery-related risks (Ministry of Health, 2020).

The quality of antenatal services provided throughout pregnancy on a regular basis, in accordance with established guidelines, is essential to ensure maternal health and the delivery of healthy infants. High-quality antenatal care must therefore be routinely provided during pregnancy to align with these guidelines (Nasriyah, 2023).

Method

This study employed a qualitative descriptive design with a phenomenological approach, generating descriptive data. The participants consisted of eight informants, including two primary informants, one key informant, and five triangulation informants. Data were collected through in-depth interviews, while the validity of the data was ensured using triangulation of techniques and sources (Abdussamad, 2021). After data collection, the next step was to analyze the raw data obtained in the field.

The data analysis model applied in this study was descriptive analysis. The collected data were examined in depth through narrative exploration. Data reduction constituted a crucial stage in the qualitative data analysis process, involving summarizing, selecting, focusing, and simplifying the raw data gathered from the field. The primary aim of data reduction was to transform complex and diverse data into more focused, relevant, and meaningful information, thereby facilitating the process of drawing conclusions.

Results

The research findings present several themes derived from interviews and observations, developed from sub-themes identified during fieldwork. The researcher categorized the findings into three main themes: Input, Process, and Output, each accompanied by related sub-themes.

Input

1. Human resources

This section describes the availability of human resources within the working area of the Puskesmas in Medan City. The description is based on the results of the interview matrix, which highlights the current status and distribution of human resources at the Puskesmas in Medan City.

Table 1. Availability of Human Resources in the ANC Program

Code	Position	Education
HNM	-Person in Charge of the Maternal and Child Health (MCH) Program -ANC Officer -Hepatitis Officer	AM.Keb
S	DDTK and TB Officer	Str.Keb
L	-Family Planning (FP) Officer -Premarital and Hajj Health Officer	Str.Keb

SR	School Health, Diabetes Mellitus, and Emergency Department Officer	S.Kep
SY	General Practitioner	S.Ked

Based on the method triangulation conducted as presented in Table 1 and supported by interview data, it was found that:

"In terms of availability, it is already sufficient; however, there is an obstacle, namely human resources with double job roles." (IU-2, 39 years old, Person in Charge of the Maternal and Child Health Program).

"The human resources in this program are adequate and quite competent; everyone in the program is already skilled. They have been in the program longer than I have as the program coordinator." (IU-1, 43 years old, Coordinator of Essential Public Health Efforts).

Based on the interview results and method triangulation, it can be concluded that the availability and competence of staff at the Medan City Community Health Center (UPT Puskesmas Kota Medan) are generally sufficient. However, some health personnel remain incomplete compared to the standard staffing requirements for community health centers, which is crucial for future service enhancement. Although the overall number of employees is adequate, several staff members hold multiple responsibilities (double jobs), resulting in less-than-optimal antenatal care services.

2. Facilities and Infrastructure

To describe the availability of facilities and infrastructure, the researcher applied both source and method triangulation techniques to ensure data validity, as reflected in the following interview excerpts:

"So far, there are no major issues with the facilities and infrastructure, except that glucose protein urine test kits and blood type test reagents are currently out of stock. The procurement request has already been submitted to the health center's treasurer; we are just waiting for the items to arrive." (IU-2, 39 years old, Person in Charge of the Maternal and Child Health Program).

"The equipment is complete, but the chairs are not very comfortable, you know. Pregnant women often experience back pain from sitting too long while waiting." (IT-3, 29 years old, Housewife).

According to information from the health center, all facilities and infrastructure are generally adequate and well-maintained. All equipment is in good working condition, and the consultation room for antenatal visits

is properly maintained. However, field observations indicated that some patients experience discomfort due to the waiting chairs provided.

3. Financing

To describe the availability of financing, the researcher employed source triangulation techniques to ensure data validity, as illustrated by the following interview with the Treasurer of the Community Health Center:

"The financing for the ANC program is quite sufficient—about 25% of the Operational Health Assistance (BOK) funds are allocated for field activities. The process begins with us preparing a proposed plan of activities in the form of a Budget Plan (RAB) or a Plan of Action (POA) for the BOK. Then, the proposal is submitted to the Health Office. We wait for approval from the Ministry and for the funds we proposed in the RAB or POA to be transferred to the Puskesmas BOK account." (IT-1, 45 years old, Treasurer of Puskesmas Sering).

Based on field findings, the financing for the Maternal and Child Health (MCH) program—particularly for the implementation of the Antenatal Care program at Puskesmas Sering, Medan City—has been carried out in accordance with the provisions of Minister of Health Regulation No. 2 of 2022 concerning technical guidelines for the use of health-specific allocation funds (*Dana Alokasi Khusus Kesehatan*).

Process

1. Planning

To describe the planning process carried out by the Community Health Center (Puskesmas), the researcher employed source triangulation techniques with the Person in Charge of the Maternal and Child Health Program (MCH) to ensure data validity. The following statement was obtained:

"Planning is conducted at the beginning of the year; for example, to finalize the work plan for early 2025, discussions are usually held at the start of 2024." (IU-2, 39 years old, Person in Charge of the MCH Program)

Based on field findings, the planning of the Antenatal Care (ANC) program at Puskesmas in Medan City is considered satisfactory, as it has been implemented according to

established standards and remains in good condition

2. Implementation

In the implementation phase, the researcher used a data validity analysis technique by observing and participating in the application of the "10 T Standard" as outlined in the Standard Operating Procedures (SOP) for Antenatal Care services.

Figure 1. Method Triangulation Process Related to the Implementation Procedures of the ANC Program

This stage involved observing whether pregnant women utilizing ANC services received the standard "10 T" services in accordance with the Ministry of Health's *Guidelines for Antenatal Care Services (KEMENKES)*. Additionally, the researcher measured the maximum duration of service delivery based on the Standard Operating Procedure (SOP), which specifies a total service time of 45 minutes.

3. Recording and Reporting

For the recording component, data validity was ensured through source triangulation based on interviews with the person in charge of the Maternal and Child Health (MCH) Program, who served as the main informant. The following statement was obtained:

"There are no specific calculations, except for the total numbers from K1 and K6." (IU-1, 39 years old, Person in Charge of the MCH Program).

Based on field findings, it was discovered that there was no complete recording of visit achievements (from K1 to K6) within the ANC program at the Community Health Center (UPT Puskesmas). However, regarding the reporting process, no major issues were found in the reporting system itself. The only challenge identified was delays in data entry into the reporting application, mainly due to unstable internet connectivity.

Output

1. ANC Visit Achievement

Table 2. Number of ANC Visits

Year	Visits		Minimum Service Standard (SPM) Target
	K1	K6	
2024	1,049 (90%)	857 (79%)	100%

Based on the antenatal care (ANC) visit data, it was found that there was a decline in ANC visits throughout 2024.

2. Maternal Mortality Rate at the Health Center

Table 3. Maternal Mortality Rate (MMR)

Year	Cases	Description
MMR per 100,000 Live Births		
2022	0	(Number of maternal deaths / Number of live births) × 100,000 2/392(100.000) = 510 per 100,000 live births
2023	0	
2024	2	

Based on the table above, it can be seen that there was an increase in maternal mortality (MMR) in 2024, whereas in the previous years, no maternal deaths were recorded.

3. Infant Mortality Rate

Table 4. Infant Mortality Rate (IMR)

Years	Cases	Description
IMR per 1,000 Live Births		
2022	2	(Number of infant deaths under 1 year / Number of live births) × 1,000 2/392(1000) = 5 per 1,000 live births
2023	0	
2024	2	

Based on the data obtained, there were two cases of infant deaths in 2024, whereas no infant deaths were recorded in the previous year.

Discussion

According to Minister of Health Regulation (PERMENKES) No. 6 of 2024, maternal health services must be delivered by qualified medical personnel and health workers with appropriate competence and authority. The regulation requires at least two antenatal visits conducted by a doctor or obstetrician-gynecologist during the first trimester. While this meets the standard quantitative requirements, there remains room for improvement in the allocation

and distribution of human resources. Based on interview findings, a key challenge identified by the Maternal and Child Health (MCH) program officers was the presence of double-job roles, which occurred due to the limited number of available staff.

Similarly, Zahroh and Muflihatin (2020) found a correlation between work opportunity and staff performance among outpatient service workers at Kalisat Health Center. In their study, "opportunity" referred to the time available to complete assigned duties. At that health center, medical record officers also served as registration clerks, reducing their capacity to provide optimal patient services (Zahroh & Muflihatin, 2020).

The findings of the present study show that the facilities and infrastructure at Puskesmas in Medan City are generally adequate and functional. However, the health center faces notable challenges, including shortages of glucose protein urine test kits and blood type testing reagents, which can compromise the quality of care. Although PERMENKES No. 6 of 2024 indicates that the availability of facilities and infrastructure meets minimum standards, the Puskesmas has undertaken restandardization measures to ensure these essential items remain available for service continuity.

Additionally, patient complaints were noted regarding the ultrasound (USG) equipment, which remains limited to 2D imaging, whereas other facilities have already adopted 3D ultrasound technology that offers greater diagnostic clarity and patient satisfaction. This finding underscores the need for technological upgrades in medical equipment to enhance service quality, patient satisfaction, and trust in antenatal care at community health centers.

Consistent with Idami and Agustina (2022), there is a significant relationship between attitude, awareness, and willingness to attend antenatal visits, as well as the time devoted to fetal health assessments (Idami & Agustina, 2022).

In a study conducted by Putri et al. (2025), it was stated that the sustainability of community health center (Puskesmas) operations, as well as the improvement of service access and quality—particularly for low-income communities—requires an efficient and effective financing system. The legislation also emphasizes the importance of regular, transparent, and

accountable evaluations to ensure proper fund management and the alignment of services with community needs (Putri et al., 2025).

According to the findings of the present study, the Medan City Community Health Center (UPT Puskesmas) conducts annual meetings to discuss budget planning and provide feedback on the progress of ongoing programs. This aligns with Sulaeman's (2021) planning theory, which states that planning implementation at the Puskesmas level includes the preparation of annual activity proposals for deliberation and reflection meetings (Sulaeman, 2021).

A study by Fatahilah (2020), which involved midwives as the primary subjects, found that integrated antenatal care (ANC) services at the Rowosari 02 Community Health Center met the 10T standard set by the Indonesian Ministry of Health. The 10T standard primarily applies to the first antenatal visit and includes essential examinations such as blood pressure measurement, body weight assessment, uterine fundal height measurement, and fetal heartbeat (FHB) monitoring. In addition, counseling or communication sessions, which are integral components of antenatal services, are provided from the first visit and assist pregnant women in addressing various challenges. Ideally, such counseling sessions should be conducted at every antenatal visit (Fatahilah, 2020).

The findings of the present study also revealed that program officers prepare various types of reports using both manual record books and digital entries submitted directly to the health center's reporting website. However, the documentation was limited only to K1 and K6 visit counts, without complete records covering all six visits.

According to Idami and Agustina (2022), incomplete documentation by health workers can negatively affect output quality, as inaccurate or incomplete records may result in errors in final data reporting (Idami & Agustina, 2022).

Similarly, as observed by Lestary et al. (2023), the Panawangan Health Center has implemented a recording and reporting mechanism consistent with existing Standard Operating Procedures (SOPs). The SP3 reports were submitted punctually to the District Health Office using both soft-copy and hard-copy formats.

Several community health center (Puskesmas) programs also utilize

information systems such as the Puskesmas Surveillance Reporting System, ASIK, e-PPGBM, and e-Kohort. The head of the health center provides guidance to all staff members regarding the proper execution of their duties. In most cases, communication and coordination are conducted both directly and indirectly (Lestary, 2023).

The success of the Maternal and Child Health (MCH) program is measured by reductions in the maternal mortality rate (MMR) and infant mortality rate (IMR), as well as by the achievement of health center visit targets. These outcomes reflect tangible improvements in antenatal care, safe delivery practices, neonatal care, and the frequency of maternal and infant visits in accordance with minimum service standards.

A decrease in MMR and IMR signifies that health interventions are effective in reducing maternal and infant mortality risks through early risk detection, management of complications, and health education. Meanwhile, high rates of antenatal and neonatal visits serve as indicators of accessibility and utilization of MCH services at the health center level. Therefore, achieving optimal MCH program performance is essential for advancing the overall health status of children within the community (Haryanto, 2023).

Conclusion

The study identified several cases of maternal and infant mortality, as well as a decline in visit rates, primarily due to residents' preference for seeking examinations from specialists rather than at the community health center (Puskesmas). Additionally, the ultrasound (USG) service was found to be less effective, as it was offered only once per week. Patient complaints also emerged regarding the approach of health workers—particularly concerning responsiveness, focus, and attentiveness—which led many patients to prefer specialist care over services at the Puskesmas. Therefore, the Medan City Community Health Center (UPT Puskesmas) should address issues related to overlapping workloads, improve the standardization of supporting facilities, and increase the frequency of ultrasound services to twice per week.

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Conflict of Interests Statement

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