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SOCIAL DETERMINANTS OF ANTENATAL CARE AND LABOUR OF PREGNANT WOMAN IN PRIMARY CARE CENTERS DURING THE COVID-19 PANDEMIC IN BLITAR CITY

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ABSTRACT

The COVID-19 pandemic has impacted pregnant women's access to health services, including antenatal care (ANC) visits and the choice of delivery place. This study aims to analyse the factors influencing pregnant women's behavior regarding ANC visits and delivery place selection in Blitar City during the pandemic. This research employed a quantitative method with a cross-sectional design. Data were collected using questionnaires administered to pregnant women in Blitar City who met the inclusion criteria. Data analysis involved statistical tests to identify the relationships between independent variables (maternal knowledge, maternal attitudes, perceptions of healthcare workers, family perceptions, and information availability) and dependent variables (ANC visit behaviour and delivery place selection). The results showed that maternal knowledge and perceptions of healthcare workers significantly influenced ANC visit behaviour, whereas maternal attitudes, family perceptions, and information availability did not show significant effects. Conversely, in delivery place selection behaviour, maternal attitudes, family perceptions, and information availability were significant factors, while maternal knowledge and healthcare workers' perceptions were not. It is concluded that individual and social factors play important roles in determining pregnant women's behaviour during a health crisis. Interventions aimed at improving health education, family support, and access to accurate information are essential to strengthen maternal health services during the pandemic.

ABSTRAK

Kata Kunci:
determinan sosial,
tenaga kerja,
ibu hamil,
tenaga kesehatan,
kesehatan ibu

Pandemi COVID-19 berdampak pada perubahan perilaku ibu hamil dalam mengakses pelayanan kesehatan, termasuk kunjungan Antenatal Care (ANC) dan pemilihan tempat persalinan. Penelitian ini bertujuan untuk menganalisis faktor-faktor yang memengaruhi perilaku ibu hamil terkait kunjungan ANC dan pemilihan tempat persalinan di Kota Blitar selama masa pandemi. Penelitian ini menggunakan metode kuantitatif dengan desain cross-sectional. Pengumpulan data dilakukan melalui kuesioner kepada ibu hamil di Kota Blitar yang memenuhi kriteria inklusi. Analisis data menggunakan uji statistik untuk mengetahui hubungan antara variabel independen (pengetahuan ibu, sikap ibu, persepsi terhadap tenaga kesehatan, persepsi keluarga, dan ketersediaan informasi) dengan variabel dependen (perilaku kunjungan ANC dan pemilihan tempat persalinan). Hasil penelitian menunjukkan bahwa pengetahuan ibu dan persepsi terhadap tenaga kesehatan berpengaruh signifikan terhadap perilaku kunjungan ANC, sedangkan sikap ibu, persepsi keluarga, dan ketersediaan informasi tidak berpengaruh signifikan. Pada perilaku pemilihan tempat persalinan, sikap ibu, persepsi keluarga, dan ketersediaan informasi berpengaruh signifikan, sementara pengetahuan ibu dan persepsi terhadap tenaga kesehatan tidak berpengaruh signifikan. Disimpulkan bahwa faktor individu dan sosial berperan penting dalam menentukan perilaku ibu hamil selama pandemi. Intervensi untuk meningkatkan edukasi kesehatan, dukungan keluarga, dan akses informasi akurat diperlukan untuk mendukung pelayanan kesehatan ibu di masa krisis kesehatan.

INTRODUCTION

Maternal health is a major global concern, as highlighted in the Sustainable Development Goals (SDGS) under the objective of promoting "good health and well-being for all ages". Specifically, SDG 3.1 aims to reduce the global maternal mortality ratio (which includes mortality during pregnancy, delivery, and postpartum) to less than 70 deaths per 100,000 live births by 2030. Additionally, SDG 3.7 seeks to ensure universal access to sexual and reproductive health services which include family planning and the integration of reproductive health into national strategies and programs (1).

The maternal mortality ratio (MMR) in developing countries was still alarmingly high in 2015, exceeding the SGD target of 239 deaths per 100,000 live births (2). Indonesia, being one of these developing countries, reported a maternal mortality rate of approximately 359 deaths per 100,000 live births in 2012, according to the Indonesian Demographic and Health Survey (3). Furthermore, in 2014, the maternal mortality rate in East Java was 95.52 deaths per 100,000 live births. This figure indicates that maternal mortality control efforts in East Java, including Blitar City, need significant improvement (4).

Maternal deaths occurring from pregnancy to postpartum are often caused by complications, such as bleeding, sepsis, unsafe abortion, and hypertension which can lead to pre-eclampsia and anaemia. In Indonesia, the 4T condition (too young, too old, too short of inter-pregnancy intervals, and too many children) contribute significantly to the number of maternal deaths. Timely Antenatal Care (ANC) for pregnant woman is essential for the early detection and immediate treatment of these complications (5).

ANC is a primary strategy for reducing maternal morbidity and mortality by monitoring the health status of both the mother and foetus, identifying potential risks and complications, providing necessary health interventions, and promoting a healthy lifestyle during pregnancy (6). Pregnant woman is advised to attend at least four ANC visits throughout their pregnancy. If ANC is not performed regularly, healthcare providers may miss opportunities for early screening of pregnancy risks. Early screening is crucial in preventing complications during pregnancy and delivery, which can ultimately reduce maternal and infant mortality rates (7).

ANC can be accessed in various health facilities in Indonesia, including hospitals, healthcare centres, and midwifery clinics. However, studies indicate that First Level Health Facilities (*Fasilitas Kesehatan Tingkat Pertama-FKTP*) are not uniformly accessible across the country (8). Access to health services is heavily influenced by availability, making equal access to these facilities crucial for reducing disparities and enhancing public health improvement programs, particularly those aimed at maternal and child health (9).

The COVID-19 pandemic has made prevention efforts regarding maternal and infant mortality more challenging, as additional precautions are necessary to safeguard the health of both mother and foetus (10). Misinformation about COVID-19—often misleading or excessive—creates anxiety for pregnant woman and their families (11), leading to reluctance or neglect toward healthcare practices during pregnancy and the postpartum period. This situation can endanger the overall health of both the mother and the foetus. Consequently, health services must ensure that antenatal and postpartum care is effectively provided to prevent adverse conditions during and after pregnancy.

Health services that fail to address these issues, combined with a less responsive government in managing maternal mortality cases, may further elevate the risk of maternal death (12). Additionally, changes in health services due to the COVID-19 pandemic have impacted the maternal and child healthcare system, particularly the referral process. The referral system in Indonesia is outlined in guidelines issued by the Ministry of Health and the East Java Governor's Decree, which designates specific hospitals as COVID-19 referral facilities. However, the referral system for pregnant women with COVID-19 in East Java remains problematic, largely due to limited facilities and infrastructure in rural areas. As a result, many healthcare facilities are ill-equipped to manage COVID-19 cases, especially for pregnant women (13).

The World Health Organisation (WHO) defines social determinants of health as complex, integrated, and overlapping social structures and economic systems that significantly impact health outcomes. An

individual's health is influenced by various factors, including the physical environment, access to health services, and social and structural factors (14). These social determinants can lead to health disparities, which refer to unequal and unfair access to healthcare services, particularly evident in maternal health during the COVID-19 pandemic. Ensuring the availability of qualified health facilities and competent health workers to manage emergencies during pregnancy and childbirth is critical for reducing MMR (15).

Dahlgren and Whitehead (1991) introduced the "Rainbow Model of Social Determinants of Health", which illustrates the multiple layers of influence on health. This model describes the relationship between individuals, their environment, and disease. The first layer (micro-level, downstream) encompasses individual behaviour and lifestyle, which have a direct impact on maternal health. The second layer (meso-level) involves social and community influences that shape norms, social values, networks, and more. The third layer (exo-level) pertains to structural factors, such as a safe residential environment, access to food and energy, clean water and sanitation, quality healthcare services, education, and decent employment opportunities. The outermost layer (macro-level, upstream) involves broader socioeconomic policies, cultural contexts, political factors, and the physical environment (16). Given these various determinants, it is important to analyse social determinants affecting ANC and childbirth in health facilities during COVID-19 pandemic in Blitar City to help reduce the MMR.

METHODS

This study was a cross-sectional observational research conducted in Blitar City at three *Puskesmas* (Community Health Centre); *Puskesmas Sukorejo, Puskesmas Sanan Wetan*, and *Puskesmas Kepanjen Kidul*. The study population consisted of 582 mothers who had babies aged 0-6 months at the time of the research. A simple random sampling technique was used to select the sample, resulting in a total of 195 participants.

Variabel yang diteliti adalah: karakteristik responden, Predisposing faktor , Enabling faktor, Reinforcing faktor, Perilaku ANC dan Perilaku Persalinan. Karakteristik responden (usia, Pendidikan, pekerjaan, pendapatan). Sedangkan Predisposing faktor terdiri dari : pengetahuan dan Sikap ibu. Enabling faktor terdiri dari : persepsi tentang pelayanan tenaga Kesehatan dan perepsi ibu tentang keluarga. Reinforcing faktor terditi dari : ketersediaan informasi.,

A research questionnaire was developed as the instrument for data collection. Data collection was conducted online using Google Forms. The data were then analysed using an ordinal regression test.

Prior to data collection, the research questionnaire underwent a validity and reliability test to ensure the quality and consistency of the instrument. The results of the validity and reliability tests of the questionnaire showed that the questionnaire was valid and reliable. The correlation value on all items with a total score of 0.001 so that the questionnaire was valid. While the Cronbach Alpha value was 0.756, which indicates that the questionnaire was reliable.

Ethical clearance was obtained from the appropriate ethics committee to safeguard the rights and confidentiality of all participants. Informed consent was acquired electronically before respondents filled out the questionnaire. Throughout the research process, measures were taken to minimize bias, including clear operational definitions for each variable and standardized procedures for data collection. This study and manuscript have received ethical approval from the Ethics Committee of the Faculty of Nursing, Universitas Airlangga, with approval number 2101-KEPK.

RESULTS

The Influence of Social Determinants of Mothers' Behaviour during ANC

The results of the analysis examining three layers of social determinants of health—knowledge factors, attitudes, perceptions of pregnant women regarding health workers, perceptions of pregnant women about family, and availability of information—are presented in Table 1. This analysis focuses on maternal behaviours during antenatal care.

The Effect of Social Determinants of Maternal Behaviour on Childbirth

Table 2 displays the findings of the analysis regarding how three layers of social

determinants of health—knowledge factors, attitudes, perceptions of pregnant women about health workers, perceptions of pregnant women about family, and availability of information—affect mothers' decisions when selecting birth attendants.

Table 1. Ordinal Regression Test Results of Social Determinant Variables of Antenatal Care (ANC) Behaviour in Mothers during 2020 COVID-19 Pandemic

Variable	ANC Behaviour								Estimate	p value
	Regional Midwife		Health Centre Midwife		Hospital Doctor		Total			
	n	%	n	%	n	%	n	%		
First Layer **Knowledge**										
High	76	42.2	57	31.7	47	26.1	180	100.0	18.556	
Mid	2	15.4	8	61.5	3	23.1	13	100.0	17.950	0.001
Low	2	100	0	0	0	0	2	100.0	0	
Attitude										
Very good	73	41.7	57	32.6	45	25.7	175	100.0	0.160	0.728
Good	7	35	8	40	5	25	20	100.0	0	
Second Layer **Perception about Family**										
Very good	68	41.5	57	34.8	39	23.7	164	100.0	0.378	0.340
Good	12	38.7	8	25.8	11	35.5	31	100.0	0	
Third Layer **Mother's Perception of Health Workers**										
Very good	63	38	57	34.3	46	27.7	166	100	1.078	0.013
Good	17	58.6	8	27.6	4	13.8	29	100	0	
Outer Layer **Information availability**										
Very good	63	40.6	55	35.5	37	23.9	155	100	0.234	0.521
Good	17	42.5	10	25	13	32.5	40	100	0	

Table 2. Ordinal Regression Test Results of Social Determinant Variables of Childbirth Behaviour in Mothers during 2020 COVID-19 Pandemic

Variable	Childbirth Behaviour												Estimate	p value
	Regional Midwife		Clinical Midwife		Health Centre Midwife		Hospital Midwife		Hospital Doctor		Total			
	n	%	n	%	n	%	n	%	n	%	n	%		
First Layer **Knowledge**														
High	29	16.1	4	2.2	18	10.0	30	16.7	99	55.0	180	100.0	0.061	
Mid	0	0	0	0	2	15.4	2	15.4	9	69.2	13	100.0	0.731	0.965
Low	2	100.0	0	0	0	0	0	0	0	0	2	100.0	0	
Attitude														
Very good	27	15.4	4	2.3	16	9.1	31	17.7	97	55.4	175	100.0	1.253	0.012
Good	4	20.0	0	0	4	20.0	1	5.0	11	55.0	20	100.0	0	
Second Layer **Family Perception**														
Very good	24	14.6	4	2.4	16	9.8	29	17.7	91	55.5	164	100.0	1,462	0.015
Good	7	22.6	0	0	4	12.9	3	9.7	17	4.8	31	100.0	0	

Third Layer
Perception of Health Workers

Very good	22	13.3	4	2.4	17	10.2	28	16.9	95	7.2	166	100.0	0.278
Good	9	31.0	0	0	3	10.3	4	13.8	13	44.8	29	100.0	0

0.444

Outer Layer
Information Availability

Very good	23	14.8	4	2.6	16	10.3	26	16.8	86	55.5	155	100.0	2,361

0.041

DISCUSSION

Social Determinants Analysis of Mother's Behaviour during ANC in the COVID-19 Pandemic at the Blitar City Health Centre

WHO recommends integrated ANC practices as a crucial step to reduce MMR and IMR (Infant Mortality Rate). ANC enables effective monitoring of both the mother and baby's health throughout pregnancy and during the delivery process. Many pregnant women prefer to seek ANC at regional midwife practices instead of at *Puskesmas* (Community Health Centre) (17). The primary reasons for this choice include distance, the duration of examinations, and shorter waiting times (18). During the COVID-19 pandemic, it is advised that pregnant women attend at least four ANC check-ups throughout their pregnancy. The first ANC visit (K1) should be conducted following COVID-19 protocols, which may include door-to-door ANC services and remote pregnancy monitoring via WhatsApp.

Several determinant factors influence maternal behaviour regarding ANC during the pandemic. These include the mother's knowledge about the available ANC services and her perception of healthcare workers. However, factors such as the mother's attitude, her perception of family support, and the availability of information did not significantly impact the ANC behaviour of pregnant women.

Having good knowledge and understanding of the importance of antenatal care is essential for pregnant women (19). This awareness aligns with one of the four pillars of safe motherhood as outlined by the WHO, aimed at protecting both mothers and their babies (20). Knowledge encompasses maintaining health during pregnancy and recognising potential risks or complications during pregnancy and delivery, allowing for early detection of issues (21). This understanding is also vital for ensuring that pregnant women can adopt healthy lifestyles and minimise the risk of complications.

Ultimately, pregnant women should be encouraged to have their routine pregnancy check-ups at a healthcare facility (22).

The results indicated that mothers have a positive perception of health workers. The attitude of health workers significantly impacts pregnant women's attendance at ANC visits. Factors like providing support, creating a comfortable environment, and delivering clear, easily understandable information about pregnancy greatly influence this attendance (22). Health workers, particularly midwives, serve as the primary point of contact for pregnant women seeking check-ups. It is essential to maintain the trust and positive perception of pregnant women towards health workers to ensure effective support and promote good interaction (23).

However, the study revealed that the mother's attitude, her family perception and the availability of information did not significantly affect pregnant women's behaviour regarding ANC. A study similarly found that the attitudes of pregnant women did not influence their use of ANC services (24). Research conducted at the Latambaga Health Centre in Kolaka District also indicated that the attitudes of pregnant women did not impact their routine ANC practices at health facilities. Nevertheless, the attitude of pregnant women remains an important determinant in efforts to improve maternal and child health and to reduce the MMR and IMR (25). Most of the pregnant women in this study demonstrated a very positive attitude towards health workers.

The availability of information did not influence the ANC behaviour of pregnant women in this study. Regardless of their varying access to information, all pregnant women opted to seek ANC at health facilities. Additionally, the perceptions of pregnant women regarding support from their husbands or families did not affect their ANC behaviour. However, support from close individuals, such as husbands or family members, is crucial as it serves as the mother's support system during

pregnancy and after delivery. This support can influence a mother's decision to seek prenatal care and plan for delivery (26). Another study found that even when pregnant women lacked support from their husbands or families, they continued to attend their prenatal assessments. Their awareness of the necessity to address the health needs of themselves and their babies motivated them to seek care independently (27).

Social Determinants Analysis of Mother's Behaviour Regarding Childbirth during the COVID-19 Pandemic at Blitar City Health Centre

The significant factors on delivery behavior were attitude, family perception and availability of information. Knowledge and perception of health workers were not significant.The majority of pregnant women who engage in ANC choose to give birth with the assistance of qualified health workers, such as midwives or doctors (28), instead of traditional birth attendants. This choice can help protect both the mother and the baby from dangerous situations that may arise during childbirth. In this study, all pregnant women opted for skilled health workers during the delivery process.

Interestingly, the knowledge of the pregnant women involved in this study did not have a significant impact on their choice of birth attendants. This finding aligns with another study conducted in the Malakopa Health Centre area of Mentawai Islands District, where it was observed that, despite limited knowledge about childbirth, pregnant women still preferred to deliver in health facilities. Additionally, positive support from husbands or family members appeared to influence the choice of delivery location (29).

The perceptions that mothers have about health workers did not seem to affect their decision-making when selecting birth attendants. The majority of pregnant women chose health workers, including regional midwives, clinical midwives, health centre midwives, hospital midwives, and hospital doctors (28). The selection of birth attendants is closely linked to the support available and the accessibility of facilities and infrastructure. If a pregnant woman is identified as having a high-risk or complicated pregnancy, essential obstetric services are readily available.

The attitude of a mother in selecting health workers to assist with her delivery is crucial, particularly when supported by her family and sufficient information (30). One study found that both the mother's attitude and her family's perceptions significantly impact the choice of birth attendants.

Family support plays a vital role in influencing the decision to select an appropriate birth attendant (31). Research conducted at the Malakopa Health Centre found that 73.9% of pregnant women who received support from their husbands opted to give birth at the *Puskesmas* (29). These findings emphasize the importance of a husband's support during pregnancy, childbirth, and the postpartum period, as pregnant women benefit from their partners providing emotional support and comfort (32).

Pregnant women and their families need to have access to comprehensive information about the safe delivery process (33). They require full details about potential childbirth emergencies, postpartum care, and infant care (34). A study has shown that providing accurate and accessible maternal and child health information about the risks associated with COVID-19 can alleviate anxiety for mothers and families, particularly during childbirth amid the pandemic. Therefore, effective communication of maternal and child health information to pregnant women and their families is highly recommended.

CONCLUSIONS AND SUGGESTIONS

Conclusion

Several factors were found to have an influence on ANC behaviour and childbirth during the COVID-19 pandemic. However, some factors did not show any significant impact. Significant factors identified were the availability of information on ANC behavior: knowledge, maternal perception of health workers and not significant factors : attitude, family perception and information availability. Significant factors on delivery behavior were attitude, family perception and information availability and not significant : knowledge and perception of health workers.

Suggestion

The government and health workers need to enhance the quality of ANC and childbirth

services. Reducing MMR and IMR can be done by improving the health status of mothers and infants. Additionally, the family plays a crucial role in supporting both the physical and emotional needs of the mother during pregnancy and after childbirth, particularly during the challenges posed by the COVID-19 pandemic.

The role of midwives in assisting with ANC and providing information is vital during the COVID-19 pandemic. It is recommended that the first ANC visit (K1) incorporates COVID-19 safety protocols and promotes door-to-door ANC services. Additionally, monitoring pregnancies via WhatsApp can help ensure that pregnant women receive the necessary care and support during this time.

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AUTHOR CONTRIBUTIONS

SRD: the main conceptual idea, proof outline, and final version of the manuscript, ERN: data collection and search literature review, YS: draft manuscript.

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