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Modifying Factors and Level of Knowledge About Pregnancy Danger Signs That Influence Antenatal Care Utilization Compliance

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A B S T R A C T

The 3rd Sustainable Development Goal (SDG) is to guarantee healthy lives and to promote well-being. Reducing the maternal mortality ratio (MMR) to 70 per 100,000 live births is one of the SDG's primary metrics. In Indonesia, 74.1% of expectant mothers had at least four antenatal care (ANC) appointments in 2018, while 70.67% of mothers finished six ANC visits in 2022. The percentage was 74.92% in East Java, while the coverage in Nganjuk Regency decreased slightly from 79.90% in 2017 to 77.92% in 2019. The purpose of this research was to examine the moderating variables and the impact of pregnancy risk sign information on ANC use compliance. The study included all 53 pregnant women in the community and used a quantitative, cross-sectional, analytic correlation design. Total sampling, questionnaires, MCH books, and observation sheets were used as data-collecting techniques. A study of binary logistic regression was used. According to the findings, there was no discernible impact of schooling on ANC compliance (p = 0.546). ANC compliance was, however, substantially correlated with knowledge (p = 0.050; PR = 7.099), gestational age (p = 0.005; PR = 0.023), parity (p = 0.020; PR = 0.089), and information (p = 0.029; PR = 0.051). Notably, ANC adherence was seven times more impacted by knowledge level. Six ANC visits must be completed to identify and avoid issues early on, which emphasizes the need to raise pregnant women's knowledge in order to increase compliance.

INTRODUCTION

Antenatal care (ANC) services are provided to women during pregnancy. These antenatal care services are considered very important in ensuring that both the mother and the baby carrying will be safe during pregnancy and delivery. Antenatal care is not only considered important but is a must for women during the process of pregnancy by visiting health workers, in this case, midwives to find out the condition of pregnant women and fetal development and early detection of risk pregnancies (Firdausia, Budihastut, and Dewi 2021). The purpose of antenatal care is a screen for pregnancy complications, to respond to the complaints of pregnant women, to prepare for labor and delivery to run safely, comfortably, and positively (Yeoh, Hornetz, and Dahlui 2016). In addition, to achieve the Sustainable Development Goals (SDGs in 2030) goal 3rd on healthy living and well-being for all, with one of the indicators being a reduction in maternal mortality (MMR) by 70 per 100,000 live births (Gutteres 2023).

Pregnancy that was originally physiological can turn abnormal as a danger sign of pregnancy if not screened properly. Danger signs of pregnancy are signs that indicate that the condition of mother and or baby are experiencing a state of potential emergency or emergency conditions that can threaten the life of the mother and or babies that are carrying (Kusmintarti *et al.*, 2022). The proportion of pregnancies that

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are expected to take place physiologically is known to be around 80-90% and only about 10-12% of pregnancies are abnormal (Antono & Rahayu, 2014).

Indicators of monitoring the health status of pregnant women are based on the mortality rate (MMR) of pregnant women. According to the World Health Organization (WHO), the maternal mortality rate (MMR) is maternal mortality during pregnancy up to 42 days after termination of pregnancy due to direct or indirect causes and its implementation (Fauziah, Hilmi, and Salman 2023). Data on MMR amount to 500,000 deaths per year in the world and 99% occur in developing countries including Indonesia (Damayanti and Nur 2020).

According to the World Health Organization (WHO), antenatal care is carried out at least 8 times during pregnancy (Susanto and Aspar 2021). ANC in developing countries, one of which is Indonesia since 2021 ANC examination is carried out at least 6 times (K6) according to government programs with details 2 times (K1-K2) carried out pregnancy checks at 1st trimester gestational age (1-12 weeks gestational age), 1 time (K3) pregnancy checks are carried out at 2nd trimester gestational age (13-27 weeks gestational age), 3 times (K4-K6) by conducting pregnancy checks in the 3rd trimester (28-40 weeks gestational age). However, antenatal care or pregnancy checks can be carried out beyond the minimum standards set by the government according to health promotion delivered by midwives (Koestuanti 2023). ANC services during the COVID-19 pandemic at least 6 times during pregnancy are a form of efforts made to improve the health of pregnant women (Susanto and Aspar 2021).

Basic Health Research Data in 2018 about the percentage of ANC achievement at least 4 times during pregnancy of 74.1% and the achievement of childbirth by health workers in health facilities of 79.3% (Ministry of Health of the Republic of Indonesia 2018). Based on data from the Director General of Public Health and Director of Nutrition for Maternal and Child Health (MCH) in 2022, the percentage of achievement of K6 pregnancy checks (at least 6 pregnancy checks) for health workers, both doctors and midwives, is 70.67% of the target of 60% set by the Indonesian government, while the percentage of achievement of pregnancy checks of at least 6 times by province in 2022 is the highest in Banten Province at 84.59%, while in East Java Province of 74.92% ranks 8th after West Java Province of 77.82%, and the lowest in Papua province with a percentage of achievement of 17.91%. Based on these data, it shows that there are still problems with the achievement of minimum pregnancy checks set by the Indonesian government (Mulati, 2023).

The K4 coverage data in Nganjuk Regency in 2017 amounted to 79.90%, 2018 data was 79.60%, and 2019 data was 77.92%. This shows that the percentage of antenatal care achievement of pregnant women in Nganjuk Regency decreases from year to year. Data on the number of MCH book ownership for pregnant women tends the fluctuate in Nganjuk Regency in 2017-2019. Data in 2017 amounted to 14,975

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pregnant women (100%), in 2018 amounted to 6,900 pregnant women (97.26%), and in 2019 amounted to 14,612 pregnant women (98.13%) (Efendi, 2021).

Using medical records, the results of a preliminary study conducted by researchers at one of the independent midwife practices in Nganjuk Regency found that the number of pregnant women in trimesters 1-3 was 34. Of the 34 pregnant women, 12 (35.3%) had ANC screening and 22 mothers did not have regular ANC (64.7%). This shows that there is still a low achievement of compliance with antenatal care utilization for pregnant women in one of the independent midwife practices in Nganjuk Regency. From the 12 people who carried out the ANC services, it is known that pregnant women experience various discomforts and complications, including postdate, hypertension, edema on the leg, pregnancy with too old age with the age of >45 years old.

The factors causing the lack of compliance of pregnant women to carry out antenatal care include ownership of MCH books, knowledge of the importance of MCH books and low utilization of MCH books information, employment factors, knowledge of the importance of antenatal care, attitudes, family support, accessibility of health facilities (Susanto and Aspar 2021). According to other causative factors, namely the age of pregnant women, parity, pregnancy distance, and availability of adequate health facilities and infrastructure (Qomar, Na'mah, and Yelvin 2020). The impact of pregnancy checks are not carried out routinely includes not detecting early complications during pregnancy, increasing morbidity rates in mothers and babies, and mortality rates in mothers and babies (Fauziah *et al*., 2023).

The efforts that are conducted to improve visit compliance are through increasing health promotion to pregnant women through classes for pregnant women and entertainment pregnancy services, midwives collaborating with cadres (Firdausia *et al*. 2021); (Dwiyanti Purbasari 2018). This study aims to analyze modifying factors and the level of knowledge about pregnancy danger signs that influence antenatal care utilization compliances.

METHOD

The type of research based on the data is quantitative and based on the intervention, such as ex post facto, and based on the time approach, namely cross-sectional studies. This research design uses correlation analytics. The study population is all pregnant women in independent midwife practice X in 2022 Nganjuk district were 53 people. The number of samples was 53 pregnant women with a total sampling technique. Data collection techniques use questionnaire instruments, MCH books and observation sheets. The independent variable is demographic factors (age, employment, level of education, information, parity, gestational age, level of knowledge about pregnancy danger signs, dependent variable is antenatal care utilization compliance. Univariate analysis of the study using descriptive frequency, bivariate analysis of the study using Chi-Square test ($p < \alpha$ 0.25 as a condition of entry to the multivariate model),

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multivariate analysis using multiple logistic regression (p <α 0.05, then H0 failed to accept). Ethical approval by Institut Teknologi, Sains, dan Kesehatan RS. dr. Soepraoen Kesdam V/ Brw.

RESULT

The study conducted in an independent midwife practice in X Nganjuk district in 2022 with 53 respondents of pregnant women found that most pregnant women have a low-risk age (between 20-35 years) 35 people (66.0%), the highest level of education is higher education in the high school and college categories is 28 mothers (52.8%), mothers mostly have employment is 29 people (54.7%), Most of the information obtained about antenatal care has been obtained either from family, health workers or through social media is 29 people (54.7%), parity is mostly multipara amount of 33 people (62.3%), gestational age is partly the 3rd trimester amount of 27 people (50.9%), the level of maternal knowledge about pregnancy danger signs is mostly high at 32 people (60.4%), and compliance with the use of antenatal care services is mostly compliance amount of 33 people (62.3%) (table1). The result of the Chi-square test is that age, level of education, employment, get information about antenatal care, parity, gestational age and level of knowledge about pregnancy danger signs of compliance with the use of antenatal care services respectively, namely (p1=0.334; p2=0.041; p3=0.600; p4=0.001; p5=0.002; p6=0.001; p7=0.000) (table 1). The results of statistical tests using multiple logistic regression found that the level of education did not affect the compliance of the antenatal care utilization while getting information about antenatal care, parity, gestational age, level of knowledge about the danger signs of pregnancy had a positive effect toward antenatal care utilization compliance. Level of knowledge has a 7 times chance of influencing antenatal care utilization compliance (table 2).

Table 1. Modifying Factors and Characteristics of Respondents

No	Variable	f (n = 53)	%	p value
1.	Age (Years)			
	High Risk (<20 & >35)	18	34.0	0.334
	Low Risk (20-35)	35	66.0	
2.	Level of Education			
	Low (Junior High School)	25	47.2	0.041
	High (Senior High School and Collage)	28	52.8	
3.	Employment			
	No employment	24	45.3	0.600
	Have employment	29	54.7	
4.	Get Information about ANC			
	Notyet	24	45.3	0.001
	Ever (Family, Health worker, social media)	29	54.7	
5.	Parity			
	Primipara	20	37.7	0.002
	Multypara	33	62.3	
6.	Gestational Age			
	Young pregnancy (1st and 2nd Trimester)	26	49.1	0.001
	Old pregnancy (3rd Trimester)	27	50.9	
7.	Level of Knowledge			
	Low	21	39.6	0.000

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No	Variable	f (n = 53)	%	p value
	High	32	60.4	
8.	ANC Utilization Compliance			
	Not compliance	20	37.7	
	Compliance	33	62.3	

Table 2. Modifying Factors and Level of Knowledge that Influence Antenatal Care Utilization Compliance

No	Variable	B	p-value (CI 95%)	Prevalence Risk (PR)
1	Level of Education	0.639	0.546	01.895
2	Get Information about ANC	2.983	0.029	0.051
3	Parity	2.421	0.020	0.089
4	Gestational Age	3.773	0.005	0.023
5	Level of Knowledge	1.960	0.050	7.099

DISCUSSION

The results of the study in Table 1 showed that of the 53 pregnant women studied, it was known that most pregnant women had a low-risk age, the highest level of education was higher education in the high school and college categories, most worked both in the private sector, and as state civil servants, most pregnant women had received information about antenatal care both from their families, health workers, namely midwives or doctors or through social media, most mothers are multiparous or have experienced giving birth before with a minimum pregnancy of at least 2 times with the current gestational age including the 3rd trimester, the level of maternal knowledge about the danger signs of pregnancy is mostly high, and most mothers are obedient in the use of routine antenatal care examinations as recommended by health workers, namely midwives and doctors.

Chi-square test results show that age, level of education, employment, obtaining information about antenatal care, parity, gestational age, and knowledge about pregnancy danger signs affect compliance with antenatal care test utilization. The results of statistical tests using multiple logistic regression found that the level of education did not affect the compliance with the use of antenatal care examination, while the acquisition of information about antenatal care, parity, gestational age, level of knowledge about the danger signs of pregnancy had a positive effect on compliance with the use of antenatal care examination. The level of knowledge has a 7 times chance of influencing compliance with antenatal care examinations for pregnant women.

Pregnancy is a natural event that will be experienced by almost all women and is a physiological condition that occurs after the process of conception and fertilization. However, the development of pregnancy can be abnormal or pathological, and there are complications if routine monitoring is not done through pregnancy checks. Naturally, the process of pregnancy due to hormonal changes in chorionic gonadotropin estrogen and progesterone can result in physical and psychological changes in pregnant women (Oktavia 2018).

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For the pregnancy process to run normally and have a low risk, routine pregnancy checks are needed according to gestational age starting from trimester 1 (gestational age 1-12 weeks), trimester 2 (gestational age 13-27 weeks), and trimester 3 (gestational age 28-40 weeks) (Idris & Sari, 2023). According to the government program, pregnancy checks should be carried out at least 6 times with details 2 times in the 1st trimester, 1 time in the 2nd trimester, and 3 times in the 3rd trimester to be able to detect danger signs during pregnancy earlier (Susanto and Aspar 2021).

Antenatal care is one type of obstetric care provided by midwives or doctors to pregnant women with the aim of monitoring, providing health support to pregnant women, and early detection of complications that can occur at any time during pregnancy (Fasiha, 2017). Pregnancy examination is carried out with a minimum standard of "10 T" in Indonesia (Weigh and measure height, take blood pressure measurements, determine the mid-upper arm circumference or MUAC to determine the value of nutritional status of pregnant women, Measurement of Fundus Uterine Height, Determine fetal presentation and fetal heart rate or fetal heart rate, Screening Tetanus Toxoid or TT immunization and give it if needed, Administration of Fe tablets, Routine laboratory tests in the form of hemoglobin and protein tests as well as urine reduction and special laboratory tests, case management, speech meetings or counseling) (Ilmiah, 2022).

Various factors affect the compliance of pregnant women in the use of routine pregnancy checks as recommended by midwives and doctors, including demographic factors (employment), knowledge factors, attitudes, ease of obtaining information about antenatal care, family support, complaints of illness or discomfort experienced by pregnant women during pregnancy, ownership of health insurance (Indrastuti 2019). Other factors, according to (Kurniasih *et al.*, 2019) are cost or socioeconomic factors, mothers living with nuclear families, distance, health facilities, media utilization, and maternal health status.

The results of the researcher's study with multiple logistic regression showed that the factors that influenced mothers to comply with utilizing routine pregnancy checks at the Midwife Independent Practice as a primary-level health facility were the acquisition of information about antenatal care, parity, gestational age, level of knowledge about pregnancy danger signs had a positive effect on compliance with the use of antenatal care utilization, while the level of education did not affect antenatal care compliance. The level of knowledge of mothers is known to have a 7 times chance of influencing pregnant women's compliance in carrying out antenatal care utilization. The results of the researcher's research are in line with research (Hijazi *et al*., 2018) that one of the factors that can affect the compliance of pregnant women to antenatal care visits is the provision of adequate information from health workers about pregnancy checks, physiological and psychological changes and signs of symptoms of danger in pregnancy. Midwives and doctors provide information through adequate counseling. According to (Ilmiah, 2022), counseling, also called interpersonal communication, is a form of health information delivery activities

delivered by midwives or doctors to pregnant women with implications, opportunities, and feedback from pregnant women.

The second factor that affects compliance with the use of routine pregnancy checks is parity. This is as the study conducted (Heaman *et al*., 2018) The parity factor is a factor causing non-compliance in conducting antenatal care examinations, and parity is the number of children a mother has born. Pregnant women who have no experience giving birth at all allow mothers to immediately do pregnancy checks earlier, while mothers who have previously had childbirth experience have a smaller possibility to immediately come for pregnancy checks to health workers, both doctors, and midwives, by government and WHO recommendations.

Likewise, (Roobiati *et al.*, 2019) show that the parity or number of children owned by mothers where if the woman has never had childbirth experience, the motivation to do an early pregnancy check immediately is known to be lower than women who are pregnant for the first time and have not had experience giving birth. Other studies have also shown that higher parity is associated with late ANC visits. Women with multiple children in the Zambian study also showed lower utilization of prenatal care because they preferred their time to care for their children, making mothers forget about quality prenatal care. They prefer antenatal care services to non-healthcare providers such as dais, elderly women in households or communities, nearby drug stores, etc. Based on this, contact with skilled healthcare providers suggests it is essential for the use of services in rural remote communities (Kurniasih *et al*., 2019).

The third factor is the gestational age of pregnant women. Gestational age is the gestational age of the fetus conceived by the mother from the first day of the last menstrual period to the current pregnancy. The results of the researcher's study (Mkandawire *et al.*, 2018) show that gestational age affects initiation to start antenatal care utilization earlier. The initiation of antenatal care in Rwanda is the same as in Indonesia, where mothers will be initiated to do pregnancy checks if their gestational age is older or at least 2nd trimester. This is because one of them is the lack of husband support in initiating early pregnancy checks. Pregnant women in Rwanda who leave without their husband's permission will be subjected to violence in the form of beatings and refusal to have sex with their mothers. Meanwhile, in Indonesia, socioeconomic reasons are the determining factor in decision-making, including initiating pregnancy checks.

According to (Hailu *et al*., 2022) pregnant women who start antenatal care visits after 16 weeks gestation will receive higher quality antenatal care services compared to pregnant women who visit antenatal care earlier at ≤ 12 weeks gestation. This affects pregnant women's perceptions of quality antenatal care services and the importance of early pregnancy checks since they are found positive for pregnancy. This happens because pregnant women do not immediately get services, or waiting times for services are

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longer. WHO recommends a good pregnancy check before 16 weeks of gestation to find out early the danger signs of pregnancy.

According to (Mkandawire *et al*. 2018) starting antenatal care at the recommended gestational age also allows time for mothers to develop a birth plan in consultation with family and health workers, both doctors and midwives. Starting antenatal care late can also lead to less than the recommended number of visits and reduce the overall number and quality of care for pregnant women.

The fourth factor is the level of knowledge of pregnant women about antenatal care and the danger signs of pregnancy. Knowledge is the result of knowing or understanding and being able to apply what is known through the five senses possessed by individuals. An individual's level of knowledge is the basis that shapes behavior. Other factors affect the level of knowledge of pregnant women about the use of antenatal care services in health facilities. According to (Kurniasih *et* al., 2019) Factors that affect the knowledge of pregnant women are the quality of counseling and health services carried out by health workers.

The results of the researcher's study are in line with the research (Roobiati *et al*. 2019) There is a relationship between the level of knowledge about the dangerous signs of 3rd-trimester pregnancy and maternal motivation to carry out antenatal care utilization by the government and WHO recommendations. Other studies also explain that the level of knowledge significantly positively affects compliance in antenatal care (Bashir, Ansari, and Sultana 2023). For mothers with high knowledge about pregnancy health, antenatal care visits are not just to fulfill obligations but become a necessity for their pregnancy (Rachmawati, Puspitasari, and Cania 2017). The mother's level of knowledge and awareness can be increased by participating in regular antenatal care during pregnancy, as complaints related to the disease tend to affect the utilization of antenatal care services significantly (Roobiati *et al*. 2019). Women who have a good understanding will have implications for the ability to receive and understand the information provided by health workers, including the symptoms of pregnancy danger, such as abnormal bleeding, severe abdominal pain, high blood pressure, or unnatural swelling, then mothers will be more likely to seek medical care sooner if these signs appear (Damayanti and Nur 2020).

CONCLUSION

The level of education has no discernible effect on compliance with antenatal care (ANC) use. On the other hand, compliance is favorably impacted by an understanding of pregnancy warning symptoms, parity, gestational age, and availability of information regarding ANC. Information is very important and has a seven-fold probability of affecting ANC adherence. Therefore, to promote early risk identification and avoid difficulties, pregnant women must attend at least six ANC checks. It is also essential for families, midwives, and health cadres to support moms in attending ANC services regularly. Complying with programs like prenatal courses may improve compliance even more. It is advised that to have a

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deeper understanding of the elements influencing ANC use compliance, future studies investigate other variables and utilize diverse approaches.

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