

# Relationship between the Age of Pregnant Women and ANC Compliance

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## ABSTRACT

Two indicators reflect the state of health status in an area: the Maternal Mortality Rate (MMR) and Infant Mortality Rate (IMR). The majority of maternal and neonatal deaths can be obtained, through Antenatal Care (ANC), with intervention in the form of early treatment of pregnancy complications. The research design we used was a correlation study. The sampling technique used a total sample of 262 pregnant women. Results Based on the analysis using chi-square obtained p-value  $<0.05$ , which means that there is a relationship between the age of pregnant women and ANC compliance ( $p = 0.006$ ). The highest level of ANC visit compliance was found in pregnant women who were in the productive age group, namely opening, 93 pregnant women (35.5%), followed by the elderly group of 11 pregnant women (4.2%) and young age of 4 pregnant women (1.5%). Therefore, health workers are expected to play a role in ANC services and expect pregnant women to be more obedient in carrying out pregnancy services.

**Keywords:** Pregnant woman, ANC compliance, Antenatal Care

## INTRODUCTION

According to the WHO definition, maternal death is the death of a person during pregnancy or within 42 days of termination of pregnancy from any cause related to or aggravated by the pregnancy or its management, but not caused by accident or injury. [1] Two indicators are often used to reflect the state of health in an area: the Maternal Mortality Rate (MMR) and the Infant Mortality Rate (IMR). MMR is the number of women who die during pregnancy or within 42 days of termination, regardless of the duration and place of delivery caused by the pregnancy or its management, and not due to other causes, per 100,000 live births. IMR is the number of babies who die before reaching the age of 1 year at a certain time per 1000 live births in the same period. [2]

Information about the high MMR is useful for developing programs to improve reproductive health, especially pregnancy services and making pregnancies safe and free of high risks (making pregnancy safer), programs to increase the number of births assisted by health personnel, setting up a referral system in handling pregnancy complications, preparing families and husbands are alert in welcoming births, all of which aim to reduce maternal mortality and improve reproductive health status. [3] The infant mortality rate is an important indicator to reflect the state of health in society because newborn babies are very sensitive to the environmental conditions where the baby's parents live and are very closely related to the social status of the baby's parents. [4]

The data shows a downward trend in the MMR indicator (per 100,000 live births)

from 390 in 1991 to 230 in 2020, or a decrease of -1.80 percent per year. Despite the decline, MMR still has not reached the 2015 MDGs target, which is 102, and the 2030 SDGs, which is less than 70 per 100,000 live births. On the IMR indicator, data shows a downward trend from 68 in 1991 to 24 in 2017, or a decrease of -3.93 percent per year. Similar to the MMR, the reduction in IMR has not reached the 2015 MDGs target of 23 and the 2030 SDGs target of 12 [5]. Amid the COVID-19 pandemic, maternal and infant mortality rates have soared. The maternal mortality rate increased by 300 cases from 2019 to around 4,400 deaths in 2020, while infant mortality in 2019 was around 26,000 cases, an increase of almost 40 percent to 44,000 cases in 2020. [6]

The direct causes of maternal death are hypertensive disorders in pregnancy (31.90%), obstetric bleeding (26.90%), non-obstetric complications (18.5%), other obstetric complications (11.80%), infections related to pregnancy (4.20%), abortion (5%) and other causes (1.70%) (Sample Registration System 2018). This cause of maternal death shows that maternal death can be prevented if the coverage of services is accompanied by good quality of service. Meanwhile, the most common causes of neonatal death were intrapartum complications (27.7%), respiratory and cardiovascular disorders (22.3%), LBW and premature (20.8%), congenital abnormalities (12.9%), and infections (8.7%) and others (7.6%). Most neonatal and under-five deaths occur in hospitals, namely 68% for neonatal deaths and 62.8% for under-five deaths. The main causes of infant death are disorders that occur during the perinatal period (49.8%), congenital and genetic disorders (14.2%), and pneumonia (9.2%). [7]

Several studies have shown that most maternal and neonatal deaths are preventable; one of the strategic and important steps to reduce maternal mortality and morbidity is through Antenatal Care (ANC), with interventions in the form of

early detection and management of pregnancy complications, from the onset of pregnancy to delivery [8]. The time of first starting ANC and the total number of ANC visits to pregnant women can affect the pregnancy outcome. Antenatal care (ANC) is a planned program in the form of observation, education, and medical treatment for pregnant women. Antenatal Care aims to monitor the progress of pregnancy, ensure the health and development of the baby, and improve and maintain the mother's and baby's physical, mental, and social health. Assessment of the implementation of health services for pregnant women can be done by looking at the coverage of K1 and K4. K1 coverage is the number of pregnant women who have received antenatal care for the first time by health personnel, compared to the target number of pregnant women in one work area within one year. At the same time, coverage of K4 is the number of pregnant women who have received standard antenatal care at least four times, according to the recommended schedule in each trimester, compared to the target number of pregnant women in one work area in one year. This indicator shows access to health services for pregnant women and the level of adherence of pregnant women to have their pregnancies checked by health workers.

According to data from the World Health Organization (WHO) [9], the percentage of antenatal care (ANC) coverage in Indonesia (82%) is still far from the standards set compared to other countries such as North Korea (95%), Sri Lanka (93%), Maldives (85%). The percentage of K1 in Indonesia in 2020 is 93.3%, and the coverage of K4 is 84.6%. This research aims to determine the relationship between pregnant women's age and ANC compliance at the North Cipinang Besar Health Center.

## LITERATURE REVIEW

Pregnancy is a term used to describe the period during which a fetus develops in a woman's uterus. Pregnancy lasts about 40

weeks, or just over nine months, from the last menstrual period until delivery. [10] These 40 weeks are divided into three periods known as the trimesters of pregnancy. Each trimester lasts about three months or 12 to 14 weeks. Pregnancy danger signs indicate a danger that may occur during pregnancy, which, if not reported or detected early, can cause the mother and fetus death. Danger signs of pregnancy must be treated immediately and detected early because any danger signs of pregnancy can lead to complications during pregnancy. Danger signs in pregnancy are symptoms that indicate that the mother and baby are in danger. Various danger signs during pregnancy.

Preeclampsia is high blood pressure accompanied by proteinuria (protein in the urine) or edema (fluid accumulation) that occurs in the 20th week of pregnancy until the end of the first week after delivery. Based on the symptoms and severity of preeclampsia, it can be divided into Mild Preeclampsia and Severe Preeclampsia. If seizures accompany pregnant women with high blood pressure and gestational age > 20 weeks, it can be categorized as eclampsia. [11]

Prevaginal bleeding in pregnancy is quite normal. In early pregnancy, the mother may experience bleeding or spotting. Abnormal bleeding that occurs early in pregnancy (red, heavy, or painful bleeding), possibly abortion, mole, or ectopic pregnancy. The characteristics of abnormal bleeding in late pregnancy (red bleeding, a lot, sometimes, not always, accompanied by pain) can mean placenta previa or placental abruption. In pregnant women, the mother will feel the movement of the fetus in her womb in the 5th month, or some mothers will feel the movement of the fetus earlier. The baby must move at least three times in 3 hours. The baby's movements will be easier to feel if the mother is lying down or resting and if the mother is eating and drinking well.

Every day in 2017, around 810 women died from preventable causes related to pregnancy and childbirth. High maternal

mortality rates in some regions of the world reflect inequalities in access to quality health services and highlight the gap between rich and poor. The MMR in low-income countries 2017 was 462 per 100,000 live births versus 11 per 100,000 live births in high-income countries. Women die as a result of complications during and after pregnancy and childbirth. The main complications that cause almost 75% of all maternal deaths, namely: [12] a) Severe bleeding (mostly bleeding after childbirth); b) Infection (usually after delivery); c) High blood pressure during pregnancy (preeclampsia and eclampsia); d) Complications from childbirth; and e) Unsafe abortion.

Implementation of ANC greatly affects the health of mothers and babies. Obedience of a pregnant woman doing ANC can detect, treat, and prevent things that can lead to pregnancy complications. ANC compliance itself is influenced by many factors, which can have a big impact on fetal development. Studies show that women with unwanted pregnancies tend to have fewer or fewer antenatal care visits. Research conducted by D'Angelo et al. shows that women with unwanted pregnancies have a 2.1 times chance of not having their pregnancies checked. Several studies have shown factors associated with unwanted pregnancies, such as age at pregnancy, education, employment status, living status together, marital status, socioeconomic status, parity, number of children, complications of pregnancy, and use of contraception. The same thing was found in Abdallah's research, which found that the proportion of women with low education (13.4%) was greater to experience unwanted pregnancies than desired pregnancies (4.1%).

WHO estimates that 98% of causes of maternal death in developing countries fall into the "preventable" category. Efforts to reduce maternal mortality can be carried out by reducing maternal morbidity by providing good quality maternal health services to the community. Maternal mortality and complications in pregnancy

can be reduced by regular antenatal care (ANC) [13]. Antenatal Care monitors the health of pregnant women and their babies so that if there is a problem, it can be identified as soon as possible and resolved as early as possible, and a planned referral is prepared.

ANC is a health service provided to pregnant women regularly where the ANC examination is a planned program in the form of observation, education, and medical treatment for pregnant women so that mothers get a safe pregnancy and childbirth process later [14]. According to Wignjosastro, ANC is carried out for regular supervision of pregnant women to prepare physically and mentally and save mothers and children during pregnancy, childbirth, and childbirth [15]. In addition, Antenatal Care / ANC is often referred to as pregnancy care, where pregnancy is a process of caring for the fetus in the womb caused by the fertilization of the egg by sperm cells. From the definitions above, it can be concluded that ANC or prenatal care is a service provided to pregnant women by carrying out prenatal checks and supervision to optimize the mental and physical health of pregnant women so that they can deal with childbirth, postpartum, preparation for giving breast milk (ASI) and their return reproductive health in a reasonable manner. The gestation period starts from conception to the birth of the fetus. Normal pregnancy duration is 280 days (40 weeks or nine months seven days), calculated from the first day of the last menstruation [16]. Trimester Pregnancy is divided into 3: a) Trimester I is the gestational age from 0 to 12 weeks; b) Trimester II is the gestational age of 13 to 27 weeks; and c) Trimester III is the gestational age above 28 to 40 weeks. ANC is health care proposed to pregnant women before and during pregnancy with the aim of early detection of maternal and fetal health problems, providing counseling or health education, and birth planning. Antenatal care is health services by professionals for pregnant women during pregnancy, carried out following established

antenatal care standards. Antenatal care is provided to pregnant women to monitor and support maternal health and detect whether the mother is pregnant normally or has problems [17].

In general, antenatal care services aim to monitor pregnancy to ensure general health and fetal growth and development, recognize early any abnormalities or complications that may occur during pregnancy, detect high risks (anemia, malnutrition, hypertension, sexually transmitted diseases), provide health education as well as preparing for full-term delivery, giving birth safely (both mother and baby), with minimal trauma. Another goal is to prevent obstetric complications, which, if possible, ensures that complications are detected as early as possible. [18] In integrated antenatal services, examinations assess pregnant women's general (physical) and psychological (psychological) conditions. Laboratory/support examinations can be carried out by simple laboratories (Hb, urine protein, and urine reduction). Health workers must refer pregnant women to a higher health service facility if the facility is unavailable.

Standard antenatal services are provided to pregnant women at least four times during pregnancy with a schedule of once in the first trimester, once in the second trimester, and twice in the third trimester. The latest antenatal care checks follow service standards, namely a minimum of 6 examinations during pregnancy and a minimum of 2 examinations by a doctor in the first and third trimesters. 2 times in the first trimester (up to 12 weeks of gestation), one time in the second trimester (over 12 weeks to 26 weeks of gestation), three times in the third trimester (over 24 weeks to 40 weeks of gestation). [19]

Based on the 2018 Riskesdas data, 45.3% of ANC was carried out at the practice of doctors/midwives, 14.6% at the Puskesmas, 12.5% at the Pustu/Polindes, 11.3% at Posyandu, 10.1% at the Hospital, and 3.1% did not have ANC, 2.9% carried out in



private clinics, and 0.3% in other places. [20] In ANC, services can also be performed by competent health workers such as doctors, midwives, and trained nurses. Most of the staff providing ANC services were midwives at 82.4%, followed by SPOG doctors at 13.4%, general practitioners at 0.5%, and nurses at 0.5%.

Based on research by Kumar et al. in 2020, it is easier for women in the lowlands to access ANC services, especially interacting directly with qualified doctors, compared to women from the mountainous regions of Bangladesh. Women in urban areas also enjoy better access to ANC facilities than their rural counterparts. [21] Distance or travel time to the nearest health facility is related to the number of antenatal visits. In addition, distance to services or access is an obstacle in utilizing ANC services. Inconvenient transportation, poor road conditions, and other road access difficulties are also obstacles.

According to research by Kumar et al. in 2020, predisposing factors for ANC visits were the mother's age, birth order, mother's education, husband's education, and religion. Several studies have shown that teenage mothers tend to rarely use ANC facilities, mainly due to fear of social stigma, compared to older mothers. Women with higher levels of education tend to take advantage of ANC services compared to women with low education. Several studies show that educated women are more self-aware and can confidently make decisions than less educated women. Although a woman's education does not significantly influence her choice of a qualified doctor, her partner's education level plays an important role, as several studies show that highly educated husbands support their partners in visiting a qualified doctor [22]. Media exposure, wealth index, and the occupation of the mother and her partner are supporting factors that play an important role in visiting ANC services. Women who are familiar with the mass media are more likely to utilize ANC services than women who are not familiar with the mass media. A

study in Ethiopia observed that higher media exposure, especially radio, and television, increased the number of ANC visits among women. In Bangladesh, wealthy women are more likely to benefit from ANC services than poor women. It is because there is a good relationship between women's economic status and ANC visits. After all, rich women can pay for health services, and poor women tend to be unable to pay for health facilities and other family needs. [23]

Josepina et al.'s research in 2019 stated that out of 80 pregnant women, there was a relationship between ANC compliance and age ( $p=0.04$ ). In this study, the group of respondents who were over 35 years of age who complied with ANC were 25 mothers (83.3%) and those who were not compliant were five mothers (16.7%), the group of respondents who were aged between 20 years and 35 years 24 mothers (57.1%) obeyed ANC and 42.9% disobeyed, four mothers (50%) were compliant with ANC, and five mothers were not compliant (50%). [24] It followed the theory by Notoatmodjo in 2010: the older you get, the more mature and stronger a person is in thinking. Thus, as they age, respondents tend to have better preparedness for their pregnancy, such as the pregnant woman's physical, emotional, and psychological maturity. [25]

## RESEARCH METHOD

The research design used was a retrospective correlation study using the MCH book approach. That is a study of the relationship between two variables to determine the relationship between maternal age regarding ANC and ANC compliance. The research was conducted at the Cipinang Besar Utara Health Center, East Jakarta, on July 25, 2022. Pregnant women who conducted ANC examinations at the North Cipinang Besar Health Center from June 2021 to June 2022. Using the total sampling method, which met the inclusion criteria, 262 pregnant women were. With the following criteria: a) Pregnant women who

carry out Antenatal Care (ANC) at the North Cipinang Besar Health Center for the period June 2021 - June 2022; b) Pregnant women who are new patients and make their first ANC visit in June, July, August and September 2021; and c) Pregnant women who have complete data in the form of registration number, name, age, pregnancy status, and frequency of ANC visits. Before the research was carried out, secondary data was collected in the form of a recap book of the MCH service health center, which was related to the number of patient populations who met the inclusion criteria for pregnant women who carried out Antenatal Care (ANC) at the North Cipinang Besar Health Center for the period June 2021 - June 2022. Then, the data reliability and validity were tested first through the Statistical Package for the Social Sciences (SPSS).

## RESULT AND DISCUSSION

The research data were taken through a questionnaire and then processed using the following tabulations.

**Table 1. Characteristics of Research Subjects Based on the Age of Respondents' Mothers**

Respondent Age	Total	Percentage
Young age	22	8,4%
Productive age	200	76,3%
Old Age	40	15,3%
Total	262	100%

Based on Table 1, it is shown that the age range of pregnant women at Cipinang Besar Utara Health Center is more common in the productive age group, namely 200 mothers (76.3%), compared to the old age, which amounted to 40 (15.3%) and the young age which amounted to 22 mothers (8.4%) %).

**Table 2. Characteristics of Research Subjects Based on Number of ANC Visits**

Number of ANC Visits	Total	Percentage
One time	98	37,4%
Two times	50	19,1%
Three times	6	2,3%
Four times	108	41,2%
Total	262	100%

Based on table 2 shows the number of ANC visits for pregnant women at the Cipinang Besar Health Center in the respondent group with 1 ANC visit, as many as 98 mothers (37.4%), the respondent group with two visits, as many as 50 mothers (19.1%), the respondent group with three visits were six mothers (2.3%), the group of respondents with four visits was 108 mothers (41.2%).

**Table 3. Description of Research Subjects Based on Age and ANC Visits**

Age Category	Frequency and Percentage	Obedience		Total
		Disobedient	Obedient	
Young age	Frequency	18	4	22
	Percentage	6,9%	1,5%	8,4%
Productive age	Frequency	107	93	200
	Percentage	40,8%	35,5%	76,3%
Old Age	Frequency	29	11	40
	Percentage	11,1%	4,2%	15,3%

The table above shows that each age has varying levels of adherence and disobedience. The frequency of non-compliant pregnant women making ANC visits was higher in each age group, whether young, productive, or old, as seen from the percentage of non-adherence, namely 58.8%, compared to pregnant women who adhered to ANC visits of 41.2%. Compared to each age group, the obedience level of pregnant women of reproductive age is better than that of young and old. The

comparison between obedient and disobedient at the young (4:18) and old (11:29) ages is very large; far more disobedient, more than twice as obedient. Meanwhile, at productive age, the number of samples obeyed slightly differed from those who did not comply (93:107).

It is because age can affect one's mindset. Pregnant women of productive age, namely aged 20-35, can think more rationally than mothers who are too young or old. So that women of productive age have more

motivation to check their pregnancies. [26] Based on research on the equity standard of antenatal care at various ages in 2019, the conclusion is that pregnant women of

reproductive age are more aware of the importance of antenatal care. Judging from the number of pregnant women, 45.6% aged 20-30 received 7T services at ANC. [27]

**Table 4. Relationship between the age of pregnant women and ANC compliance**

			Age		Total	P.Value
			Non-productive age	Productive age		
Obedience	Disobedient	Frequency	47	107	154	0.006
		Percentage	30.5%	69.5%	100.0%	
	Obedient	Frequency	26	93	108	
		Percentage	13.9%	86.1%	100.0%	
Total		Frequency	62	200	262	
		Percentage	23.7%	76.3%	100%	

Based on the results of the analysis between the two variables using chi-square, it was found that the p-value was <0.05, which means that there is a relationship between the age of pregnant women and ANC compliance (p = 0.006). Based on the results of this study, it was found that there was a relationship between the age of pregnant women and ANC compliance (p<0.05). It is known from the results that the level of ANC compliance is found in productive age compared to young and old age. The total sample in the study was known to be 262 samples, with the percentage level of ANC compliance being 3.7% at a young age, 86.1% at a productive age, and 10.2% at an old age. It is following research conducted in the Work Area of the Slawi Health Center which stated that pregnant women who regularly perform ANC are mostly in the age group of mothers 20-35 years by 80% or as many as 16 pregnant women out of a total of 23 pregnant women samples in the study. Based on research conducted by Lubis E, stated that age is one of the factors that influence adherence to ANC visits. The age range of pregnant women around 20-35 years of productive age tend to make antenatal care visits more regularly because they feel that prenatal care is very important. Meanwhile, pregnant women aged <20 years or young tended not to understand the importance of conducting antenatal visits, and those aged >35 years or old tended to be indifferent to antenatal visits because they felt they had had a good pregnancy experience. [28; 29]

Age is the age of an individual from birth to birth. The more mature the level of maturity and strength a person will be in thinking and working. When a person's age increases, their maturity in thinking improves, so pregnant women are motivated to check their pregnancy and know the importance of antenatal care. Age greatly determines a mother's health; the mother is at high risk if the pregnant woman is under 20 and over 35 years old. Age under 20 years is feared to have a risk of complications that are closely related to women's reproductive health, and when over 35 years have a high risk due to a decline in reproductive function. This disorder is not only physical due to the not optimal development of the function of the reproductive organs, but psychologically they are not ready to bear the moral, mental, and emotional upheavals that arise, as well as the lack of experience in conducting antenatal care examinations.

The theory by Notoatmodjo supports the results and several studies that have been put forward, where it is said that the older the mother is, the more mature the person's level of maturity and strength in thinking and working in testing the relationship between the age factor and adherence to implementing ANC. The age of pregnant women also affects a mother's education level. Notoadmodjo states that a higher level of education can increase one's understanding, influencing behavior, in this case, compliance with ANC visits [30]. The level of education can affect a person's level of exposure and accessibility to health information. The higher the level of

education, the pregnant woman can find better information, especially in terms of health, so that the mother can understand her health condition, and vice versa. If the mother knows a lot of information about the importance of complying with ANC, then the mother will know how to reduce the risk of pregnancy, one of which is by complying with pregnancy check-ups.

The results showed that pregnant women who perform ANC regularly are 20-35 years old. It shows that most pregnant women are in the healthy reproductive age range. The age of 20-35 is a mature age for a woman, so at that age, a person has great curiosity and concern for her pregnancy and high awareness to make regular ANC visits. It follows Mufidah's research: pregnant women who carry out regular ANC examinations are mostly aged 20-35 [31]. The study results also follow the research conducted by Dairi and Owoyokun, which stated that pregnant women aged 20-35 years utilized ANC services better than pregnant women aged <20 years and > 35 years. [32]

Pregnancy development, both improving maternal health and normal fetal development, can be monitored at antenatal care check-ups. In addition, antenatal care examinations can detect early signs of danger or pregnancy complications that may affect the mother and fetus and enable pregnant women to give birth without complications. In the antenatal care examination, observation, education, and medical treatment will be carried out for pregnant women to obtain a safe process of pregnancy and preparation for childbirth.

Based on research by Montol et al. in stated that there was a significant relationship between the frequency of antenatal care checks and the incidence of stunting. Mothers with less than four antenatal care checks during pregnancy had a 2.86 times greater chance of experiencing stunting than mothers who had four antenatal care checks. Factors underlying the mother not having an examination visit during pregnancy, such as a mother who is still unsure about the

certainty of her pregnancy, support from her husband or family to carry out an examination as early as possible at the beginning of the trimester of pregnancy, and the mother's ignorance about the benefits of the first visit to pregnancy since the trimester [33].

According to Camelia et al.'s research in 2018, it was stated that 19 respondents had stunted children, even though the frequency of prenatal check-ups was according to standards. It was due to other factors, namely the implementation of ANC quality, that did not meet standards, for example, not measuring upper arm circumference. , if there is a chronic energy deficiency in pregnant women so that management is not carried out, such as providing additional food to pregnant women and monitoring nutritional status during pregnancy.

The impacts that may arise as a result of not carrying out ANC regularly are:

K1 is the first contact of pregnant women with health workers with good clinical/midwifery and interpersonal competence to get integrated and comprehensive services according to standards. First contact should be made as early as possible in the first trimester, preferably before the eighth week. Visit 1 (K1) in trimester 1 (one) is usually screened by a doctor to see possible risk factors for pregnancy or co-morbidities in pregnant women, including ultrasonography (USG). If, during K1, a pregnant woman comes to the midwife, the midwife will still perform ANC according to standards, then refer her to the doctor. Examinations carried out by doctors still follow the pattern of history, physical examination, supporting examinations, and follow-up. Based on the 2015 MDGs, the target for K1 coverage in Indonesia is >92.7%. 2 If the K1 coverage is low, the risk factors for complications of pregnancy and labor complications are not detected early, so that treatment can be delayed and can result in maternal death.

At least once in the second trimester (K2) at 14 to 28 weeks of gestation to receive standard antenatal care during one period.



The examination objectives in the second trimester include a) Introduction of complications in pregnancy and their causes; b) Screening for preeclampsia, Gemelli, reproductive tract infections, and urinary tract infections; and c) Repeat pregnancy planning. If K2 coverage is low, one of the danger signs in pregnancy, such as signs of preeclampsia or eclampsia, cannot be detected early. Preeclampsia is increased blood pressure and excess protein in the urine after more than 20 weeks of gestation.

In the 3rd trimester of pregnancy, pregnant women must carry out ANC examinations twice in this trimester, where the doctor examines them at least once. This examination aims to detect risk factors for labor and birth planning. Examinations carried out by doctors still follow the pattern of history, physical examination, supporting examinations, and follow-up. K3 antenatal visits are usually carried out at 32 weeks of gestation. During this examination, an anamnesis will be carried out in the form of a history of the mother's current health, tetanus immunization status, birth planning (place of delivery, transportation, potential blood donors, financing, delivery companion, etc.), choice of contraceptive plan, and a thorough examination. The impact of non-compliance with K3 antenatal visits is that it causes less harm to the mother and fetus, such as the fetus can be born prematurely. Then other complications are bleeding and preeclampsia.

Based on Sukatni's research in 2012, neonatal deaths in Indonesia are related to antenatal care, delivery assistance, birthplaces, and neonatal visits. In addition, mothers who did not attend ANC visits or < 4 times during pregnancy and had babies with birth weights > 2500 grams had a 2.6 times higher chance of experiencing neonatal death than mothers who had ANC visits > 4 times. Based on Lorong and Pangaribuan's research in 2015, mothers who gave birth at the age of <20 years or > 35 years with unfulfilled K4 were 4.3 times at risk of giving birth to children who would

die in the early neonatal period compared to mothers with fulfilled K4 after being controlled by variables gestational age and delivery complications. Mothers who experience labor complications with K4 not fulfilled have a risk of 2.8 times experiencing early neonatal death compared to mothers with K4 fulfilled after controlling for the variables of gestational age and mother's age at delivery.

## CONCLUSION

Based on the results of the research and discussion regarding the relationship between the age of pregnant women and ANC compliance at the North Cipinang Besar Health Center with 262 samples, it can be concluded: a) The age range of pregnant women at North Cipinang Besar Health Center was found more in the productive age group, namely as many as 200 mothers (76.3%); b) Most pregnant women at Cipinang Besar Utara Health Center carried out ANC visits at most four times, totaling 108 pregnant women (41.2%); c) The highest level of adherence to ANC visits was found in pregnant women who belonged to the productive age group, namely 93 pregnant women (86.1%), followed by the old age group of 11 pregnant women (10.2%) and those aged young as many as four pregnant women (3.7%); and d) There is a significant relationship between the age of pregnant women and the level of ANC compliance at the Cipinang Besar Utara Health Center for the period June 2021 – June 2022 ( $p < 0.05$ ). The results of this study prove a relationship between the age of pregnant women and the level of adherence to ANC; for this reason, it is recommended that health workers provide education about the importance of ANC for pregnant women.

### *Declaration by Authors*

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## REFERENCES

1. Collier AR, Molina RL. Maternal mortality in the United States: updates on trends, causes, and solutions. *Neoreviews*. 2019 Oct;20(10):e561-74.
2. Owusu PA, Sarkodie SA, Pedersen PA. Relationship between mortality and health care expenditure: Sustainable assessment of health care system. *Plos one*. 2021 Feb 24;16(2):e0247413.
3. Habsari SK, Sofiah S, Sumardiyono S. Behind the Slow Road to Progress: Addressing Myriad Causes of the Persistence of Relatively High Maternal Mortality in Brebes Regency after the Post EMAS Program. *InIOP Conference Series: Earth and Environmental Science* 2018 Feb 1 (Vol. 116, No. 1, p. 012090). IOP Publishing.
4. Tanaka S. Environmental regulations on air pollution in China and their impact on infant mortality. *Journal of health economics*. 2015 Jul 1;42:90-103
5. Milhan IT, Prawitasari S. The Relationship between Age, Parity, Early Detection, K1-K4 Visits, Integrated ANC, Three Times Obgyn's Ultrasound Examination, and Maternal Mortality.
6. Nasrul Z, Usman S, Maulana T, Saputra I. Determinants of Compliance of Pregnant Women in Participating in the Class Program for Pregnant Women in Aceh Besar District. *Journal of World Science*. 2023 Mar 24;2(3):386-401.
7. Tesfay N, Tariku R, Zenebe A, Hailu G, Taddese M, Woldeyohannes F. Timing of perinatal death; causes, circumstances, and regional variations among reviewed deaths in Ethiopia. *Plos one*. 2023 May 9;18(5):e0285465.
8. Samosir AF, Subiyatun S, Khofiyah N, Keb S. *Hubungan Motivasi Ibu Hamil Dengan Kepatuhan Kunjungan Antenatal Care Pada Trimester III* (Doctoral dissertation, Universitas Aisyiyah Yogyakarta).
9. World Health Organization. Tracking universal health coverage: first global monitoring report. World Health Organization; 2015 Jul 21.
10. Keski-Nisula L, Kynäräinen HR, Kärkkäinen U, Karhukorpi J, Heinonen S, Pekkanen J. Maternal intrapartum antibiotics and decreased vertical transmission of *Lactobacillus* to neonates during birth. *Acta paediatrica*. 2013 May;102(5):480-5.
11. Rosser ML, Katz NT. Preeclampsia: an obstetrician's perspective. *Advances in chronic kidney disease*. 2013 May 1;20(3):287-96.
12. Oladapo OT, Adetoro OO, Ekele BA, Chama C, Etuk SJ, Aboyeji AP, Onah HE, Abasiattai AM, Adamu AN, Adegbola O, Adeniran AS. When getting there is not enough: a nationwide cross-sectional study of 998 maternal deaths and 1451 near-misses in public tertiary hospitals in a low-income country. *BJOG: An International Journal of Obstetrics & Gynaecology*. 2016 May;123(6):928-38.
13. Zureick-Brown S, Newby H, Chou D, Mizoguchi N, Say L, Suzuki E, Wilmoth J. Understanding global trends in maternal mortality. *International perspectives on sexual and reproductive health*. 2013 Mar 1:32-41.
14. Jo Y, Alland K, Ali H, Mehra S, LeFevre AE, Pak S, Shaikh S, Christian P, Labrique AB. Antenatal care in rural Bangladesh: current state of costs, content and recommendations for effective service delivery. *BMC health services research*. 2019 Dec;19:1-3.
15. Hondro SM, Pasaribu VS, Purba EM, Manurung HR, Dewi ER, Marliani M. Factors Associated with the Irregularity of Antenatal Care Visits at the Amandraya Health Center in South Nias Regency in 2022. *Jurnal eduhealth*. 2022 Dec 13;13(02):904-11.
16. Maulida MC, Machfudloh H, Kusumawardani PA. Midwifery Care for Pregnant Women in the Third Trimester with Complaints of a Flat Stomach at the Clinic. *Indonesian Journal of Innovation Studies*. 2020;12:10-21070.
17. Baffour-Awuah A, Mwini-Nyaledzigbor PP, Richter S. Enhancing focused antenatal care in Ghana: an exploration into perceptions of practicing midwives. *International Journal of Africa Nursing Sciences*. 2015 Jan 1;2:59-64.
18. Exavery A, Kanté AM, Hingora A, Mbaruku G, Pemba S, Phillips JF. How mistimed and unwanted pregnancies affect timing of antenatal care initiation in three districts in Tanzania. *BMC pregnancy and childbirth*. 2013 Dec; 13:1-1.

19. Warri D, George A. Perceptions of pregnant women of reasons for late initiation of antenatal care: a qualitative interview study. *BMC pregnancy and childbirth*. 2020 Dec;20(1):1-2.
20. Kasmiasi K. Asuhan kehamilan. Asuhan Kehamilan. 2023 Mar 20.
21. Mberu BU, Haregu TN, Kyobutungi C, Ezeh AC. Health and health-related indicators in slum, rural, and urban communities: a comparative analysis. *Global health action*. 2016 Dec 1;9(1):33163.
22. Chanda SK, Ahammed B, Howlader MH, Ashikuzzaman M, Shovo TE, Hossain MT. Factors associating different antenatal care contacts of women: A cross-sectional analysis of Bangladesh demographic and health survey 2014 data. *PLoS One*. 2020 Apr 29;15(4):e0232257.
23. Deo KK, Paudel YR, Khatri RB, Bhaskar RK, Paudel R, Mehata S, Wagle RR. Barriers to utilization of antenatal care services in Eastern Nepal. *Frontiers in public health*. 2015 Aug 14; 3:197.
24. Syamsiyah N. Pengaruh media leaflet terhadap perubahan pengetahuan dan intensi ASI eksklusif pada ibu hamil di Puskesmas Kecamatan Pesanggrahan Jakarta Selatan Tahun 2013.
25. Ikhwanudin A. *Perilaku Kesehatan Santri (Studi Deskriptif Perilaku Pemeliharaan Kesehatan, Pencarian Dan Penggunaan Sistem Kesehatan Dan Perilaku Kesehatan Lingkungan Di Pondok Pesantren Assalafi Al Fithrah Surabaya)* (Doctoral dissertation, Universitas Airlangga).
26. Mariyana M. Readiness for Childbirth in Primigravida Trimester III Pregnant Women at the Spirit of Internal Health Center, Barito Kuala District. *Jurnal eduhealth*. 2023 Jun 7;14(02):866-71.
27. Gibore NS, Ngowi AF, Munyogwa MJ, Ali MM. Dietary habits associated with anemia in pregnant women attending antenatal care services. *Current developments in nutrition*. 2021 Jan;5(1): nzaa178.
28. Hasibuan K. *Faktor Yang Berhubungan Dengan Kepatuhan Ibu Hamil Dalam Melakukan Kunjungan Antenatal Care (Anc) Di Bpm Syarifah Lubis, Am. Keb, Skm Kota Padangsidempuan Tahun 2018* (Doctoral Dissertation, Institut Kesehatan Helvetia).
29. Finer LB, Zolna MR. Shifts in intended and unintended pregnancies in the United States, 2001–2008. *American journal of public health*. 2014 Feb;104(S1):S43-8.
30. Dewi AC, Ermiasi E, Hidayati NO. Pregnant women's knowledge about high risk in pregnancy. *Journal of Maternity Care and Reproductive Health*. 2018 Dec 26;1(2).
31. Mufidah AM, Meilani N, Djanah N. Factors affecting postpartum contraceptive utilization in Yogyakarta. *Jurnal Kesehatan Ibu dan Anak*. 2021 Oct 30;15(1):25-35.
32. Gudayu TW, Woldeyohannes SM, Abdo AA. Timing and factors associated with first antenatal care booking among pregnant mothers in Gondar Town; North West Ethiopia. *BMC pregnancy and childbirth*. 2014 Dec;14(1):1-7.
33. Huru MM, Yulianti H, Kristin DM, Seran AA, Mamoh K, Mangi JL. Pemeriksaan Kehamilan Dan Penyuluhan Kesehatan Untuk Mencegah Stunting Dalam 1000 Hari Pertama Kehidupan. *JMM (Jurnal Masyarakat Mandiri)*. 2023 Feb 1;7(1):807-15.

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