



Midwives' Knowledge About Antenatal Care Services During the Covid-19 Pandemic

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Abstract. Background: Pregnant women are categorized as one of the vulnerable groups of being infected with Coronavirus Disease 2019 due to the physiological changes that result in immunity decreasing and can cause serious impacts for them. Information about Covid-19 is still very limited, including data on abundant who have been confirmed positive for Covid-19 cannot be concluded in Indonesia. A study of 55 gravid and 46 neonates infected with Covid-19 concluded that there was no vertical transmission from mother to baby and it was not known whether Covid-19 increased cases of miscarriage and stillbirth. The results of a study found that 37 pregnant women who were confirmed positive Covid-19 through PCR did not find severe pneumonia or matter life death, and among 30 neonates who were born there were no confirmed cases of Covid-19. Based on the data, midwives have an important role in providing antenatal care services, especially during this pandemic.

Aim: This study aims to determine midwives' knowledge in providing antenatal care during the Covid-19 period.

Methods: The method used was the correlation of the midwives' knowledge in providing antenatal care services during the Covid-19 period.

Results: The study found that there is a relationship between the midwives' knowledge about antenatal services during the Covid-19 pandemic with the PPE standards used by health workers, antenatal services during the pandemic with ideal conditions for healthy pregnancy (fit for pregnancy), and there is a relationship between antenatal services during the Covid-19 pandemic with priority efforts for pregnancy services.

Conclusion: It is necessary to have an understanding of increasing midwives' knowledge to continue to pay attention to health protocols in providing antenatal care services. Improving the knowledge through webinars, training, and workshops in increasing midwives' knowledge in providing antenatal care services while still paying attention to health protocols.

Keywords: knowledge · midwifery · ANC · covid-19

1 Introduction

Corona Disease 19 (Covid-19) is a disease caused by the Novel Coronavirus (2019-nCoV) or nowadays called SARS-CoV-2, a new type of virus that has not previously been identified in humans.

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According to the latest data, there are 219 countries affected by Covid-19, with confirmed data of 50,266,033 cases, 1,254,567 deaths. Meanwhile, there are 440,569 positive cases reported in Indonesia, with details of which are reported to be 372,266 recovered cases and 14,689 reported deaths. This figure shows a high number of disease cases. However, it is still higher if compared with the number of people who are not infected. It means that in addition to handling cases of infection Covid-19, other health service efforts such as promotion and prevention need to remain a concern for health service workers, especially at Public Health Center (*Puskesmas*) and also at the Midwives' Independent Practice [1].

The Indonesian government, through Presidential Decree No. 12 of 2020 determined the non-natural disasters of the spread Covid-19 as a national disaster because this disaster has an impact on the increase in the number of casualties, the economy, and the area affected by this disaster [2]. Therefore, in some countries, including Indonesia, prevent and control the infection Covid-19 and the main concern is the vulnerable groups whose potential risk is higher, one of which is the group of pregnant women [3].

Childbearing are listed as one of the groups at risk of being infected with Covid-19 because during pregnancy there are physiological changes that result in a partial decrease in immunity [4] and can have serious consequences for childing. Information about Covid-19 is still very limited, including data on pregnant women who have been confirmed positive for Covid-19, which cannot be concluded in Indonesia [5]. The results of a study of 55 pregnant women and 46 neonates infected with Covid-19 did not confirm vertical transmission, and it was not known whether it increased cases of miscarriage and stillbirth [6]. The results of a study conducted by Schwartz (2020) found that 37 pregnant women who were confirmed with Covid-19 through PCR did not find severe pneumonia and/or maternal death; among 30 neonates who were born, there were no confirmed cases of Covid-19 [7].

Pregnant women have a higher risk of serious disease, morbidity, and mortality in some cases of Covid-19. Changes in the immune system in pregnancy will cause the possibility of associated complaints and more severe symptoms, especially at the end of pregnancy. Most pregnant women only experience mild to moderate covid/flu-like symptoms, which >90% do not require termination of pregnancy; the risk is increased in comorbid pregnancies. Priority efforts for pregnancy services include preventing and minimizing the transmission of Covid-19 to pregnant women and ensuring optimal and safe health services for pregnant women with patients under surveillance and confirmed Covid-19.

Pregnant women are advised to continue routine antenatal care with some modifications. The minimum recommendation for face-to-face consultation during pregnancy is 6 times (TM 1: 1x, TM 2: 2x, TM 3: 3x). If necessary, you can do consultation *telemedicine* (telephone/video call) outside the predetermined schedule. Folic acid, calcium, vitamin D, and iron supplementation are still given according to national recommendations. In addition, initial screening was also carried out by not mixing maternal and child health care facilities with general patients. The principle of infection prevention (PI) and physical distancing must always be put in order. Initial screening is also carried out based on the Covid-19 Early Warning System (EWS) with the determination of the *score Covid-19 EWS* (Table 1).

Table 1. Antenatal Services in Covid-19 Pandemic Period by Indonesian Association for Obstetrics and Gynaecology (POGI) Recommendations in 2020

No	Gestational Age	Antenatal Examination	Ultrasound	Remarks
1	<11 weeks	No need to do	Detect intra-uterine pregnancy	If there are suspicious complaints of ectopic pregnancy
2	11–13 weeks	If necessary	Determination of gestational age	Basic laboratory: DPL, UL, GDS, HIV, HbSAg, VDRL/TPHA
3	20–24 weeks	If needed	Fetal anatomy	
4	28 weeks	If needed	If needed	Laboratory: DPL, TTGO
5	32 weeks	If needed	When needed	
6	36 weeks	When needed	If needed	Laboratory: DPL, UL, Ur/Cr, SGOT/SGPT, PT/APTT
7	37 weeks - delivery	Yes	If needed	Antenatal examinations per week

Ideal conditions for a healthy pregnancy (fit to be pregnant) include age between 20–35 years, normal nutritional status (BMI 18.5–25.0), no CFS (MUAC \geq 23.5 cm), not anemia (HB \geq 12 g/dl, number of children <3, distance between 2–3 years, and no have chronic diseases such as high blood pressure, diabetes, cancer, psychiatric problems, or controlled conditions, do not have infectious and sexually transmitted diseases such as pulmonary tuberculosis, malaria, STIs, HIV, and others or diseases under controlled conditions.

Pregnant women carry out antenatal care examination at midwives with a minimum service standard of 10T. 1x doctor's examination in the 1st trimester (for screening of complete maternal health). ANC is carried out at least 6 times during pregnancy, namely in the 1st trimester at least 2x, the 2nd trimester at least 1x and the 3rd trimester at least 3x. 1x doctor's examination in the 3rd trimester (to detect pregnancy complications/prepare for labor referral if necessary). The first-trimester antenatal examination is not recommended, unless an ultrasound examination is required if there are complaints and suspicions of an ectopic pregnancy. Second-trimester antenatal examination can be done by telephoto clinical consultation unless a complaint or emergency condition is found. In the third trimester (3 weeks of gestation and above) antenatal examinations should be carried out with the main objective of preparing for labor (Table 2).

According to Perinasia, antenatal care recommendations in the third trimester are made to plan the place of delivery. The policy of screening for Covid-19 in mothers about giving birth adjusts to local zoning and policies. In the red-yellow zone, namely:

Table 2. According to POGI's recommendations, pregnant women perform antenatal care at least 6 times face to face which is detailed as follows:

Gestational Age	Type of visit	Ultrasound	Details
<12 weeks	Phone/video If needed face-to-face can be done (based on risk factors)		<ul style="list-style-type: none"> • History for risk factor screening, complaints related to pregnancy • Counseling prevention COVID-19 • Counseling pregnancy danger signs requiring a hospital visit
12-week	Face-to-face	Confirmation of gestational age and delivery estimate, screening for aneuploidy (NT) if there is an indication	<ul style="list-style-type: none"> • Routine laboratory • <12 weeks if not previously received antenatal care
20–24 weeks	face to face	Anatomy of fetal Growth of the fetus	Leave request laboratory tests: FBC, UL, OGTT to bring results on the next examination
28 weeks	face to	face,if required	Evaluation of the results of laboratory tests fetal growth
32 weeks	face to face	Fetal growth, ju eg	ANC routine
36 weeks	face to face	amniotic fluid, placental	ANC routine
37–41 weeks	face advance	location.	

1. Pregnant women without signs and symptoms of Covid-19 at 37 weeks of gestation are screened to determine their covid status with RT-PCR swabs.
2. After the swab is carried out, the patient is advised to carry out independent isolation.
3. If facilities and resources for RT-PCR are not available, a rapid test or NLR blood test can be carried out.

Meanwhile, in the green zone, it must follow the general surveillance of Covid-19, which is screening for symptomatic pregnant women.

According to the ANC guidelines from the Ministry of Health, the ANC service guidelines by midwives during the Covid-19 pandemic are as follows:

1. There are no complaints that pregnant women are asked to apply the contents of the MCH handbook at home. Immediately go to a healthcare facility if there are any complaints/danger signs.
2. Makes an appointment by telephone/WhatsApp, ANC in the first trimester 1x collaboration with a doctor for a medical examination
3. Conduct a comprehensive assessment according to the standards of Covid-19 precautions. Being able to coordinate with Neighbourhood Head (RT)/Head of Hamlet (RW)/Head of Village (Kades) regarding maternal status (Patient/s Under Surveillance (ODP/PDP), Covid+)
4. ANC is carried out according to standards (10T) with PPE level 1. Perform risk factor screening; if there are risk factors refer according to standards.
5. Companion pregnant women and the health team in charge of using masks and implementing Covid-19 prevention protocols.
6. Postpone classes for pregnant women/do it online
7. Pregnancy consultation, IEC and counseling can be done online (guide to filling in P4K).

According to the Covid-19 acceleration task force, the implementation of services in the First Class Health Facilities (FCHF) is in accordance with the general principle, namely screening is carried out based on examination of body temperature (≥ 38 °C), presence of symptoms, a history of close contact and a history of travel to areas where local transmission has occurred. Health workers who carry out examinations for pregnant women, assist in childbirth, and provide essential care for newborns are required to use personal protective equipment (according to the guidelines). Pregnant women, birthing women and newborns in an Emergency or Patient Under Supervision (PDP) status or confirmed as Covid-19 must be referred to the Covid-19 Referral Hospital or the nearest Regional Obstetrics and Neonatal Care (PONEK) capable hospital. Delivery assistance is carried out based on the rules of preventing infection (see procedure). Health workers adhere to the principles of hand hygiene and physical distancing at all times [8].

According to the Covid-19 acceleration task force about antenatal care services (ANC), pregnant women without influenza fever and symptoms. Then, there is no history of close contact or no travel history from areas where local transmission has occurred, as well as negative rapid test results (if possible), can be served in the FLHF by a midwife/doctor who is required to use level 1 PPE. Pregnant women with Person Under Surveillance (ODP) status can be served in the FLHF, while Patient Under Surveillance (PDP) must be referred to Advanced Referral Health Facilities (ARHF). Give a clear statement on the referral letter that PDP's diagnosis and the request for a PCR examination and further treatment by a specialist. Pregnant women get the same type of ANC service as a normal situation (according to SOP), except that the ultrasound examination is temporarily postponed for mothers with PDP or confirmed Covid-19 until there is a recommendation that the episode of isolation ends; the mother is considered a high-risk case. Pregnancy consultation is carried out according to WHO recommendations which pregnant women are asked for the first mandatory visit in the 1st trimester recommended by the doctor for screening for risk factors (HIV, syphilis, hepatitis B). If the first visit is at the midwife, then after the ANC is carried out, the pregnant women are then given a doctor's referral for examination. The second mandatory visit made in the 3rd trimester

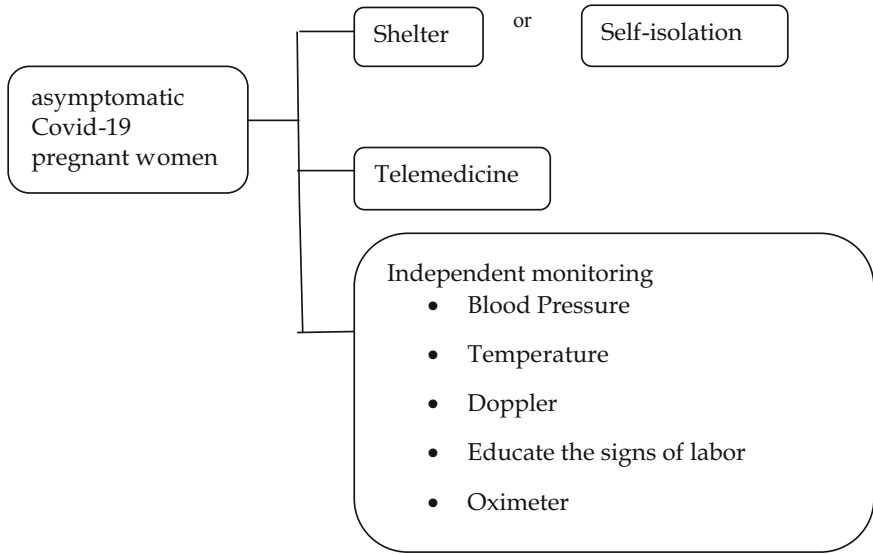


Fig. 1. Management of pregnant women with asymptomatic Covid-19

(one month before the due date) must be by the doctor in preparation for delivery. Any further visits may be made on a health professional's advice and preceded by appointment to meet. Pregnant women are asked to study the Maternal and Child Health (MCH) book. If possible, pregnancy consultations and education classes for pregnant women can use telemedicine applications (for example, sehati tele-CTG, halodoc, alodoc, pregnant women friends, etc.) and continuous education via Bunda SMS (Fig. 1).

Midwives and obstetricians must continue to provide essential services related to antenatal care, referrals, and consultations. Modifications that can be made are spacing out consultations and alternative schedules or reducing the schedule for antenatal examinations. Dilemma of high-risk patients who still need continuous and rigorous antenatal care [9].

During the antenatal examination, several components need to be added, including that patients need to be counseled on complications from Covid-19 when exposed to infection, emphasizing the need to prevent infection and exposure to Covid-19, providing mental health services to health workers and patients. Providing counseling on changes to service flows during a pandemic [10].

Antenatal examinations and ultrasound as indicated. Ultrasound is limited to answering essential clinical questions. It may be considered possible to defer some tests if the risk of exposure to infection outweighs testing benefits. Dilemmas arise when determining priorities and assessing risk versus benefit.

According to POGI, the Covid-19 maternal referral flow, the Indonesian Ministry of Health has appointed a capable hospital of managing Covid-19. In reality, not all hospitals in Indonesia are able to manage pregnant women with Covid-19. POGI recommends that a Maternal Referral Hospital be appointed in each region/region so that health resources and facilities can be prepared as well as possible. The criteria for a maternal referral

hospital include minimum type C hospital which has an Emerging and Reemerging Infectious Disease Team (PINERE) who will work together with Obsgyn specialists and join the COVID group team at the hospital where they work, following recommendation updates POGI for screening, diagnosis and maternal care with Covid-19 [11].

The flow of patient referral services to hospitals according to the Indonesian Ministry of Health as follows [12]:

1. Patients directly to the hospital (Self consent and without an agreement) must go through a screening process, if suspected covid, go to the emergency room triage or special covid outpatient
2. Through referral FCHF/ARHF, if suspected or confirmed, go directly to triage covid, no screening needed.
3. Must complete an independent study through online registration, if indicated directly to the Covid outpatient triage. If not, do a screening.

Patients, visitors, or families of patients and hospital staff needs to be done screening [12].

Personal protective equipment (PPE) is needed by medical personnel, especially in dealing with the current corona virus outbreak. The use of PPE cannot be arbitrary because there are levels of use that must be adjusted to the health service location, profession, and medical personnel activities. PPE is designed to be a barrier against penetration of free, liquid or airborne particles and protect its use against the spread of infection. The use of good PPE will be a barrier against infections produced by viruses and bacteria. The determination of the type of PPE used in handling Covid-19 is based on the health service location, the profession and the activities of medical personnel [13].

The tiered use of PPE includes:

1. The first level is for health workers who work in public practice places where the activities do not pose a high risk, do not cause aerosols. The PPE that is worn consists of a surgical mask, gown and examination gloves.
2. The second level is where health workers, doctors, nurses, midwives, and laboratory staff work in the patient care room, where non-respiratory samples are taken or in the laboratory, the PPE needed is a head covering, google, surgical mask, gown and sarong. Disposable hand.

The third level is for health workers who work in direct contact with patients who are suspected or have confirmed Covid-19 and carry out surgical actions that cause aerosols, then the PPE used must be complete, namely headcover, face protection, eye protection or google, N masks (%), cover all, surgical gloves and waterproof boots.

Table 3. Research

Variables	Information
Y	Antenatal services during the pandemic Covid-19
X1	Standard PPE used by health workers
X2	Ideal conditions for healthy pregnancy (fit for pregnancy)
X3	Priority efforts for pregnancy services
X4	Age

2 Method

2.1 Determining the Number of Samples

The population in this research is 2846 respondents. The sample is part of the number and characteristics of the population. The numbers taken in this study are based on the Slovin formula. The results obtained were 351 respondents.

2.2 Variable Research

In this research, variables that are used on the midwives' knowledge in antenatal care during a pandemic is shown in Table 3.

2.3 Research Assumption Test

To perform correlation analysis on parametric statistics, the data for each variable must be normally distributed. This normality test aims to determine whether the residual variables are normally distributed or not. If the data is normally distributed, the analysis used is parametric statistical analysis. Parametric statistical analysis that can be used for correlation testing is the Pearson Product-Moment correlation. If the data is not normally distributed, then use nonparametric statistical analysis. In nonparametric statistical analysis, the correlation test that can be used is Rank Spearman's correlation.

The normality test was carried out on all research variables, namely Y, X1, X2, X3, and X4. The normality test aims to determine whether each variable to be analyzed in this study is normally distributed or not. If it is normally distributed, parametric statistics can be used. Hypothesis and basis for normality test decision making are as follows:

- Hypothesis:
- H_0 = Data Normally distributed
- H_1 = Data not Normally distributed
- Significance Level = 0.05
- Decision Making:

H_0 is accepted if the Asymp value is Sig. (p value) > 0.05.

H_0 is rejected if the Asymp value is Sig. (p-value) < 0.05.

Table 4. Interpretation of Correlation Index:

Interval Coefficient of	Correlation Level
0.00–0.199	Very Low
0.20–0.399	Low
0.40–0.599	Moderate
0.60–0.799	Strong
0.80–1.00	Very Strong

Sugiono [14]

The results of the normality test using the Kolmogorov-Smirnov test and the Shapiro-Wilk test. Both tests are normality tests, where the Shapiro-Wilk test is considered more accurate when the number of subjects observed is less than 50.

The analysis results of the two tests produce the same p-value for each data for each variable. It can be seen that each variable has a p-value of 0.000, which means < 0.05 because the p-value of $0.000 < 0.05$, H_0 is rejected. Therefore, it can be concluded that the data from each of the research variables (Y, X1, X2, X3, and X4) are not normally distributed. It means that parametric statistical analysis cannot be used. The analysis used is nonparametric statistical analysis because it is not normally distributed; the correlation test that can be used is the Spearman Rank test.

2.4 Spearman Rank Correlation Test

As previously explained, the Spearman rank correlation is part of nonparametric statistics. The purpose of this correlation test generally is to see the level of strength of the relationship between variables, see the direction of the correlation, and see whether the relationship is significant or not. Interpretation of the strength and weakness of the correlation obtained can be done using the conditions shown in Table 4.

The direction of correlation is seen in the correlation coefficient figures as well as the level of correlation strength. The value of the correlation coefficient lies between $+1$ to -1 . If the correlation coefficient is positive, then the correlation between the two variables is unidirectional. The purpose of this unidirectional relationship is that if the variable X increases, so the Y variable will. Conversely, if the correlation coefficient is negative, the relationship between the two variables is not unidirectional; it means that if the variable x increases, the variable Y decreases.

The strength and direction of the correlation (relationship) will have meaning if the correlation between variables is significant if the Sig. (2-tailed) value of the calculation is smaller than the value of $\alpha = 0.05$. Meanwhile, if the value is Sig. (2-tailed) is greater than $\alpha = 0.05$, then the correlation between these variables can be said to be insignificant. The results of the spearmen rank correlation test analysis are as follows:

3 Results and Discussion

The results of the research are as follows:

Variable	P value
PPE standard used by health workers	
Ideal condition for healthy pregnancy (fit for pregnancy)	0.146
Priority efforts for pregnancy services	0.266
Age	0.010

1. Correlation between antenatal care during the COVID-19 pandemic (Y) and PPE standard used by health workers (X1)

From the output above, the correlation coefficient is 0.265. That is, the level of strength of the relationship (correlation) between the antenatal service variables during the Covid-19 pandemic (Y) and the PPE standard used by health workers (X1) is 0.265 or low. The coefficient value is positive, so the relationship between the two variables is unidirectional. Thus it can be interpreted that antenatal services during the Covid-19 (Y) pandemic are in accordance with the POGI's recommendations in 2020; the PPE standards used by health workers (X1) are according to standards. Based on the output above, it is known that the significance value or Sig. (2-tailed) of 0.000, because of the Sig. (2-Tailed) $0.000 < 0.05$, so there is a relationship between the antenatal care variables during the Covid-19 pandemic (Y) and the PPE standards used by health workers (X1).

The use of good PPE will be a barrier against infections produced by viruses and bacteria. The determination of the type of PPE used in handling Covid-19 is based on the health service location, the profession, and medical personnel's activities.

2. The correlation between antenatal care during the Covid-19 pandemic (Y) and ideal conditions for healthy pregnancy (proper pregnancy) (X2)

From the output above, the correlation coefficient is 0.146. It means that the level of strength of the relationship (correlation) between the variables of antenatal care during the Covid-19 pandemic (Y) and ideal conditions for healthy pregnancy (fit for pregnancy) (X2) is 0.146 or low. The coefficient value is positive, so the relationship between the two variables is unidirectional. Thus it can be interpreted that antenatal care during the Covid-19 (Y) pandemic is in accordance with the POGI's recommendations in 2020, so the ideal conditions for healthy pregnancy (fit to be pregnant) must be ideal. Based on the output above, the significance value or Sig. (2-tailed) of 0.006, because of the Sig. (2-Tailed) $0.006 < 0.05$, then there is a relationship between the antenatal care variables during the Covid-19 pandemic (Y) and the ideal conditions for healthy pregnancy (fit to be pregnant) (X2).

Ideal conditions for healthy pregnancy (fit for pregnancy) include age between 20–35 years, normal nutritional status, no CFS, no anemia, number of children < 3 , the distance between 2–3 years, no chronic diseases such as high blood pressure, diabetes, cancer, psychiatric problems, or disease under controlled conditions, do

not have infectious diseases and sexually transmitted diseases such as pulmonary tuberculosis, malaria, STIs, HIV, etc.

3. Correlation between antenatal care during the Covid-19 pandemic (Y) and priority efforts for pregnancy services (X3)

From the output above, the correlation coefficient is 0.266. It means that the level of strength of the relationship (correlation) between the variable antenatal care during the Covid-19 pandemic (Y) and the priority effort for pregnancy services (X3) is 0.266 or low. The coefficient value is positive, so the relationship between the two variables is unidirectional. Thus it can be interpreted that antenatal care during the Covid-19 (Y) pandemic is in accordance with POGI's recommendations in 2020 in order to prioritize pregnancy services (X3) must be appropriate. Based on the output, the significance value or Sig. (2-tailed) of 0.000, because of the Sig. (2-Tailed) 0.000 < 0.05, so there is a relationship between the variables of antenatal care during the COVID-19 pandemic (Y) and priority pregnancy services (X3).

Pregnant women get the same type of ANC services as normal situations (according to SOP), except that ultrasound examination is temporarily postponed for mothers with PDP or confirmed Covid-19 until there is a recommendation that the episode of isolation ends. Pregnancy consultation is carried out according to the recommendation of WHO.

4. Correlation between antenatal care during the Covid-19 pandemic (Y) and midwife age (X4)

From the output above, the correlation coefficient is -0.010. It means that the level of strength of the relationship (correlation) between the antenatal care variable during the Covid-19 pandemic (Y) and the midwife's age (X4) is 0.010 or very low. The coefficient number is negative so that the relationship between the two variables is unidirectional. Thus it can be interpreted that antenatal services during the Covid-19 (Y) pandemic are in accordance with POGI's recommendations in 2020, the midwife's age (X4) is getting lower. Based on the output above, the significance value or Sig. (2-tailed) of 0.851, because of Sig. (2-Tailed) 0.851 > 0.05, so there is no relationship between antenatal care during the Covid-19 pandemic (Y) and midwife age (X4).

Midwifery age is not related to antenatal care during the Covid-19 pandemic because all practicing midwives have met the requirements to practice midwifery and are legally recognized by the government. Health workers at the hospital, public health centers and independent practices, village midwives and health cadres in the work area have knowledge of Covid-19 transmission, as well as knowledge of danger signs and emergency symptoms of mothers and newborns.

4 Conclusion

Based on the research, it can be concluded that midwives' knowledge in antenatal care services during a pandemic, as follows:

- a. There is a correlation between the variables of antenatal care during the Covid-19 pandemic and the PPE standards used by health workers.

- b. There is a correlation between the variables of antenatal care during the Covid-19 pandemic with ideal conditions for healthy pregnancy (fit to be pregnant).
- c. There is a correlation between the variables of antenatal care during the Covid-19 pandemic and priority efforts for pregnancy services.
- d. There is no correlation between the variables of antenatal care during the Covid-19 pandemic and the age of the midwife.
- e. It is necessary to have an understanding of increasing midwives' knowledge to continue to pay attention to health protocols in providing antenatal care services.
- f. Improving the knowledge through webinars, training, and workshops in increasing midwives' knowledge in providing antenatal care services while still paying attention to health protocols

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