



ISSN 2354-7642 (Print), ISSN 2503-1856 (Online)
JNKI (Jurnal Ners dan Kebidanan Indonesia)
(Indonesian Journal of Nursing and Midwifery)
Tersedia *online* pada:
<http://ejournal.almaata.ac.id/index.php/JNKI>

JNKI (Jurnal Ners dan Kebidanan Indonesia)
**(Indonesian Journal of Nursing
and Midwifery)**

The correlation between pregnant women with COVID-19 and mode of delivery

Taufik Rahman, Fatimah Fatimah, Sundari Mulyaningsih, Dyah Pradnya Paramita, Prasetya Lestari*,
Amanah Rahma Delia

Department of Midwifery , Faculty of Health Sciences, Alma Ata University Yogyakarta
Jalan Brawijaya 99, Tamantirto Yogyakarta

*Corresponding author: prasetya.lestari@almaata.ac.id

ABSTRAK

Latar Belakang : Covid-19 atau Coronavirus disease 2019 merupakan virus yang disebabkan oleh Severe Acute Respiratory Coronavirus 2 (SARSCoV-2). Wanita hamil yang terpapar covid-19 akan memungkinkan menimbulkan resiko yang lebih besar dibandingkan wanita yang tidak hamil. Menurut data Perkumpulan Obstetri dan Ginekologi Indonesia (POGI) Jakarta, 13,7% perempuan hamil lebih mudah terinfeksi Covid-19. Terdapat dua hal yang perlu dipahami dalam tatalaksana ibu melahirkan dengan Covid-19, yaitu tatalaksana terhadap ibu dan bayi yang dilahirkannya.

Tujuan untuk mengetahui hubungan karakteristik ibu hamil yang terpapar covid-19 dengan jenis persalinan sekarang di RSUD Bagas Waras Klaten.

Metode : penelitian ini adalah Analitik kuantitatif dengan pendekatan Retrospektive study. Populasinya adalah ibu bersalin yang terpapar covid-19 di RSUD Bagas Waras Klaten. Metode pengambilan sampling menggunakan nonprobability dengan tehnik Purposive Sampling. Uji statistik menggunakan Spearman's rho.

Hasil : Mayoritas responden dengan usia reproduksi sehat sebanyak (82%), pekerjaan responden mendominasi sebagai ibu rumah tangga sebanyak (54,6%), usia kehamilan Aterm (80%), Riwayat kehamilan multigravida (63,4%), jumlah anak tidak lebih dari 2 (95,1%), jenis persalinan sekarang mayoritas dengan metode sectio caesarea sebanyak (83,1%). Dari hasil analisis uji spearman's rho dengan p-value cukup $r=0,323$ antara usia ibu dengan riwayat kehamilan, sedangkan hubungan antara riwayat kehamilan dengan jumlah anak dengan $r=0,259$, antara jumlah anak dengan usia ibu menunjukkan ada korelasi cukup yaitu $r=353$, sedangkan kharakteristik ibu dengan jenis persalinan tidak ada hubungan. **Kesimpulan :** ada hubungan yang cukup signifikan antara karakteristik ibu bersalin yang terpapar covid-19 dengan jenis persalinan sekarang di RSUD Bagas Waras Klaten.

KATA KUNCI : COVID-19; cara pengiriman; karakteristik

ABSTRACT

Background : COVID-19 is a virus caused by the Severe Acute Respiratory Coronavirus 2 (SARS-CoV-2). Pregnant women with COVID-19 will likely pose a greater risk compared to nonpregnant women. The Indonesian Society of Obstetrics and Gynecology Association (ISOG) stated that 13.7% of pregnant women are more susceptible to COVID-19. In the maternity management of mothers with COVID-19, the management for the mother and her child should be comprehended.

Objectives : This research aims to determine the relationship between the characteristics of pregnant women with COVID-19 with the current mode of delivery at Bagas Waras Hospital, Klaten.

Methods: This is quantitative analytical research conducted using a retrospective study approach. The population was maternity mothers with COVID-19 at Bagas Waras Hospital.

The sampling method used was non-probability with purposive sampling technique. The statistical test was performed using Spearman's rho.

Results: *Most respondents (82%) were in healthy reproductive age, 54.6% were housewives, 80% were in A term gestational age, 63.4% had multigravida, 95.1% had no more than 2 children, and 83.1% underwent sectio caesarea. The analysis showed correlation between maternal age and history of pregnancy (adequate p-value; $r = 0.323$), between pregnancy history and the number of children ($r = 0.259$), and between the number of children and the age of the mother ($r = 0.353$). Meanwhile, there was no relationship between mothers' characteristics and the mode of delivery.*

Conclusions: *There was significant relationship between the characteristics of pregnant women with COVID-19 and the current mode of delivery at the Bagas Waras Hospital.*

KEYWORD: COVID-19; mode of delivery; characteristics

Article Info :

Article submitted on July 30, 2022

Article revised on August 29 2022

Article received on September 30 , 2022

INTRODUCTION

COVID-19, which stands for coronavirus disease 2019, is a virus caused by Severe Acute Respiratory Coronavirus 2 (SARS-CoV-2). Its appearance was first reported in Wuhan, China on December 31, 2019 and was determined by the World Health Organization (WHO) as a pandemic on March 11, 2020. COVID-19 can attack anyone regardless of age, comorbidities, gender, even women in gestation period (COVID-19 is declared a pandemic) (1). The health profile data in 2021 exhibited that up to December 31, 2021, Indonesia had 96.25% recovery rate with 4,114,334 recovered cases and 3.38% of Case Fatality Rate (CFR) with 144,094 death cases (2). The maternal mortality rate in 2021 was still high for various reasons. The highest cause, however, was due to the COVID-19 outbreak. Likewise, the Indonesian Health profile stated that the highest cause of mortality rate was due to COVID-19 infection (2.982 cases).

The clinical manifestations of COVID-19 vary, some of which are commonly occurred such as respiratory symptoms in the form of fever, dry cough, shortness of breath. Some atypical clinical manifestations also occur such

as diarrhoea, lymphopenia, and chest X-rays that show lung abnormalities. Based on the severity, COVID-19 infection is divided into asymptomatic and mild-moderate (80%), severe (15%) and critical (5%) symptoms which can be pneumonia that progresses to acute respiratory distress syndrome (ARDS), septic shock, and other systemic complications requiring mechanical ventilation (3).

Pregnant women exposed to COVID-19 will likely to undergo a greater risk than nonpregnant women because during pregnancy oxygen consumption will increase and functional residual capacity will decrease. Pregnancy condition will suppress immunity and disrupt the immune system, leading women to be more susceptible to infection (4). The Indonesian Society of Obstetrics and Gynecology (ISOG) Jakarta revealed that 13.7% of pregnant women are more easily infected with COVID-19 (5).

Two things which need to be comprehended in the maternity management of mothers with COVID-19 are the management of the mothers and their babies. The newborn management must be given priority due to the risk of transmission from their mothers. All general management, however, should still be given to the newborn,

including cutting the umbilical cord and the providing nutritional support immediately after birth lahir (6,7).

Sectio caesarea (SC) is a method of delivery mostly carried out by health workers to women with COVID-19 to avoid complications during delivery process which may endanger both the mothers and her children (8). In addition, the risk of transmission from pregnant women to their babies as well as the effects of drugs taken need to be taken into consideration in nutritional provision. Therefore, breast milk (BM) provision, either given directly (breastfeeding) or given with expressed breast milk or donor breast milk must go through special considerations. Formula feeding can also be a possible option. Moreover, treatment and nutritional provision to babies are carried out according to the condition of the mother's illness (9).

Based on the result of the study, more than 80 percent of the type of deliveries during the pandemic in 2021 which casarean section (8). While other difference in this study is that data on pregnant women suffering from covid is associated with type of delivery and characteristics of respondents that may have a relationship. Research Objectives This research aims to determine the relationship between the characteristics of pregnant women with COVID-19 with the current mode of delivery at Bagas Waras Hospital, Klaten.

MATERIALS AND METHODS

This is a quantitative analysis study conducted by employing retrospective approach using secondary data. This research was carried out for 8 months from January to August 2021. The population in the study were women with COVID-19 giving birth at Bagas Waras Regional Public Hospital, Klaten, and 183 women were used as samples. The independent variable was respondents' characteristics and the dependent variable was the mode of delivery currently

performed. The inclusion criteria included mothers tested positive before the delivery and the mode of delivery carried out, while those with incomplete data were excluded. The statistical test was performed using Spearman's rho.

RESULTS AND DISCUSSION

RESULT

Respondents' Characteristics in Bagas Waras Regional Public Hospital, Klaten

Table 1. Distribution of respondents' characteristics

Characteristics	Frequency	%
Age		
Healthy Reproductive	150	82.0
High Risk	33	18.0
Total	183	100%
Occupation		
Housewives	100	54.6
Entrepreneur	20	10.9
Private Sector Employee	42	23.0
Civil Servants	6	3.3
Laborer	15	8.2
Total	183	100%
History Of Pregnancy		
Primigravida	64	35.0
Multigravida	116	63.4
Grande multigravida	3	1.6
Total	183	100%
Number Of Children		
0-2	174	95.1
>3	9	4.9
Total	183	100%
Current Mode Of Delivery		
Spontaneous	25	13.7
SC	152	83.1
AVM	6	3.3
Total	183	100%

Source: Processed secondary data

The respondents in Bagas Waras Regional Public Hospital, Klaten, were dominated by those in healthy reproductive age (150 people or 82%). This percentage is higher than those at high-risk age (33 people or 18%). Based on their occupation, most respondents (100 people or 54.6%) were housewives, followed by working women (83 people or 45.4%). Meanwhile, most respondents also had history of pregnancy with

multigravida (116 people or 63.4%), had more than 2 children (174 people or 95.1%) and underwent SC (152 people or 83.1%).

Current Mode of Delivery of Mother Confirmed with COVID-19

Table 2. Current mode of delivery

Current Mode Of Delivery	Frequency	%
Spontaneous	25	13.6
SC	152	83.1
AVM	6	3.3
Total	183	100%

Source: Processed secondary data

This research found that most mothers (152 people or 83.1%) gave birth by sectio caesarea. Likewise, Amorita and Syahriarty (2021) argued that there were 36 mothers with COVID-19 (59.1%) who underwent elective sectio caesarea due to the risk of experiencing maternal deterioration and the difficulty of performing mechanical ventilation due to the gravid uterus

and fetal compromise (10,11). In the group of babies born to mothers with COVID-19, it has been agreed that the preferred mode of delivery is by caesarean section to reduce the risk of transmission to either the babies at birth or to the health workers who help the mothers (7). This is in accordance with a recommendation issued by The Royal College of Obstetricians and Gynecologists in 2020 which stated that there is no prohibition of conducting vaginal delivery if the conditions can be met for the mother, fetus, and the surrounding environment to help prevent horizontal transmission (7).

As can be seen in Table 3, most mothers infected with COVID-19 (152 people or 83.1%) at Bagas Waras Regional Public Hospital, Klaten, used sectio caesarea as a mode of delivery. Meanwhile, respondents who underwent sectio caesarea were dominated by women in the healthy reproductive category or those aged 20-35 years (125 people or 83.3%). According to their occupation, the majority of respondents were

Table 3. A cross table of respondents' characteristics with mode of delivery in Bagas Waras Regional Public Hospital, Klaten.

Category	Current Mode of Delivery						Σ	
	Spontaneous		SC		AVM		F	%
	F	%	F	%	F	%		
Age								
Healthy reproductive	21	14.0	125	83.3	4	2.7	150	100.0
High-risk	4	12.1	27	75.8	2	6.1	33	100.0
Total	25	13.7	152	83.1	6	3.3	183	100.0
Occupation								
Housewives	19	19.0	77	77.0	4	4.0	100	100.0
Entrepreneur	2	10.0	17	85.0	1	5.0	20	100.0
Private Sector Employee	2	4.7	40	95.2	0	0.0	42	100.0
Civil Servant	0	0.0	5	83.3	1	16.7	6	100.0
Laborer	2	13.3	13	86.7	0	0.0	15	100.0
Total	25	13.7	152	83.1	6	3.3	183	100.0
Pregnancy History								
Primigravida	4	6.2	59	92.2	1	1.6	64	100.0
Multigravida	20	17.2	91	78.4	5	4.3	116	100.0
Grande multigravida	1	33.3	2	66.7	0	0.0	3	100.0
Total	25	13.7	152	83.1	6	3.3	183	100.0
Number of Children								
0-2	22	12.6	146	83.9	6	3.4	174	100.0
>3	3	33.3	6	66.7	0	0.0	9	100.0
Total	25	13.7	152	83.1	6	3.3	183	100.0

Source: Processed secondary data

housewives (77 people or 77,0%). Furthermore, the result also revealed that based on their history of pregnancy, most respondents (91 people or 78,4%) had experienced more than one pregnancy or also known as multigravida. It was also found that and most respondents (146 people or 83.9%) had no more than 2 children.

The current mode of delivery and maternal age

Table 3 shows that the majority of respondents (150 people) at Bagas Waras Regional Public Hospital, Klaten, were classified under the healthy reproductive age at 20-35 years. There were 21 (14%) women infected with COVID-19 who gave birth by spontaneous delivery, 152 (83,1%) with sectio caesarea, and 4 (2,7%) with AVM. The result is in accordance with that conducted by Rani and sari (2020) entitled "The Effect of Maternal Age on the Method of Delivery in RSUD Dr.H. Abdul Moeloek, Lampung Province" which stated that pregnant women classified under the high-risk age group (<20 years and >35 years) have twice the risk of experiencing abdominal delivery compared to those at the reproductive age (20-35 years). The current mode of delivery and maternal occupation. The majority of respondents'

occupations (100 people) at RSUD Bagas Waras Klaten were housewives, with 19 women (19.0%) experiencing spontaneous birth, 77 women (77%) with sectio caesarea, and 4 women with AVM (4.0%). The result of this study is related to another study which revealed that 24.3% women gave birth using sectio caesarea and one of the causing factors is the low level income ($p = 0,02$) (13).

The current mode of delivery and pregnancy history

According to Table 3, most respondents (116 women) had multigravida pregnancy history consisting of 20 women who gave birth using spontaneous delivery (17.2%), 91 women with sectio caesarea (78.4%), and 5 women with AVM (4.3%). In contrary, the result of multiple logistic regression statistical tests carried out in another study obtained p value of 0.567 ($p > 0, 05$) which indicates that there is no relationship between gravida status and cesarean delivery (13).

The current mode of delivery and the number of children

The majority of respondents (174 women) had no more than two children, 22 of whom underwent spontaneous delivery (12.6%), 146

Table 4. The correlation among maternal age, history of pregnancy, and the number of children in Bagas Waras Regional Public Hospital, Klaten

			Maternal Age	Maternal occupation	History of Pregnancy	The number of children	Current Mode of Delivery
Spearman's rho	Maternal Age	Correlation	1.000	.066	.323**	.353**	.049
		Coefficient Sig. (2-tailed)	.	.376	.000	.000	.514
		N	183	183	183	183	183
	Maternal occupation	Correlation	.066	1.000	-.075	-.009	.123
		Coefficient Sig. (2-tailed)	.376	.	.313	.907	.098
		N	183	183	183	183	183
	History of Pregnancy	Correlation	.323**	-.075	1.000	.259**	-.120
		Coefficient Sig. (2-tailed)	.000	.313	.	.000	.105
		N	183	183	183	183	183
	The number of children	Correlation	.353**	-.009	.259**	1.000	-.132
		Coefficient Sig. (2-tailed)	.000	.907	.000	.	.074
		N	183	183	183	183	183
Current Mode of Delivery	Correlation	.049	.123	-.120	-.132	1.000	
	Coefficient Sig. (2-tailed)	.514	.098	.105	.074	.	
	N	183	183	183	183	183	

(83.9%) underwent section caesarea, and 6 (3.4%) underwent AVM, as can be seen in Table 3. Likewise, Evi Soviati (2016) also suggested that 2-3 is the safest parity for pregnancy and childbirth. Based on the incidence of maternal mortality, high parity (more than 3 children) has a higher mortality rate compared to low parity (having 1 child); an unpleasant birth experience will have an impact on the next delivery, while for women with first experience of pregnancy, will usually be anxious by myths about labor pain before delivery (14). The correlation among maternal age, history of pregnancy, and the number of children in Bagas Waras Regional Public Hospital, Klaten

DISCUSSION

The Spearman's rho test result showed p-value of 0.0001, which means that there was a significant (<0.05) and a sufficient correlation ($r=0.323$). It indicates that there was adequate or moderate relationship between maternal age and a history of pregnancy at Bagas Waras Regional Public Hospital, Klaten. The result obtained in the present study can be concluded and can be linked to that conducted by Suryaningrum, et al (2019) who argued that there is a relationship between maternal age and pregnancy history. A person's age can affect his mindset (16). The age of 20-35 years, which is said to be a healthy productive age, makes pregnant women think more rationally compared to the age classified into the high-risk factor. Because they think more rationally, it is possible for pregnant women to have higher enthusiasm and motivation in antenatal care and reduce their fear of the risk of being infected with COVID-19 (16). Meanwhile, factors that were not related to maternal age in this study were occupation and methods of delivery, in contrast to the results of previous studies which suggested that there is a relationship between age and type of delivery where pregnant women in the risk group

(<20 years and >35 years) tend to experience abdominal delivery twice compared to the non-risk age group (20-35 years).

The current study also found that there was no relationship between maternal occupation, maternal age, pregnancy history, number of children, and mode of delivery. The previous study, however, discovered a significant relationship between maternal occupation and the methods of delivery, arguing that women who underwent sectio caesarea were dominated by working mothers, while those who do not work were smaller in number. The current study obtained P-value of 0.0001 which means significant (<0.05) and showed sufficient correlation ($r=0.259$) which indicates that there was a relationship between pregnancy history and the number of children in Bagas Waras Regional Public Hospital, Klaten. Meanwhile, there were 50% of women with multigravida experiencing anemia, while there were only 31% of women with primigravida who suffer from anemia (17). Anemic pregnant women with COVID also had an increased risk of ICU admission (RR 1.63, 95% CI: 1.25, 2.11) and death (RR 2.36, 95% CI: 1.15, 4.81) (18). The compliance of pregnant women in consuming iron tablets was 51.5% and 50.8% of whom had anemia which was influenced by the limited frequency of visiting the health care facilities due to the COVID-19 pandemic; those who do not take iron tablets regularly will experience a decrease both in haemoglobin and immunity level, even lead to COVID-19 susceptibility (19). The results of this study exhibit no relationship between the history of pregnancy and the type of delivery.

In addition, there was significant relationship between the number of children and maternal age, as evidenced by P-value of 0.0001 ($<0,05$) and sufficient correlation ($r=0.353$). This result is in accordance with that suggested by Sary (2014) who discovered that there is a relationship between the number of desired children and the

number of maternal age. The analysis explained that the percentage of mothers who want more than 2 children is increasing along with their age. On the contrary, the younger the mother is, the more she will regard that only having 2 children is enough. This opinion is also supported by the results of statistical tests (p value = 0.000) and it can be concluded that there is a significant relationship between maternal age and the number of children desired. In this study, however, there was no relationship between the number of children with maternal occupation and the current type of delivery.

According to the result of this study, the majority of mothers exposed to COVID-19 gave birth using sectio caesarea. Similarly, Risnawati, et al (2021) also claimed that there is a concern that complication will occur in the middle of the delivery process which may endangers the condition of the mother and fetus. In addition, cesarean delivery process is expected to minimize the occurrence of virus transmission from patients to medical personnels who assist in the delivery process. A literature review also stated that up to date, there is no strong clinical evidence that recommends one method of delivery; thus, the labor is carried out based on obstetric indications by taking into account the wishes of the mother and her family, except for those with respiratory problems who require immediate delivery in the form of cesarean section or vaginal surgery (21).

As presented in Table 4, the majority of mothers (152 people or 83,1%) infected with COVID-19 in Bagas Waras Regional Public Hospital, Klaten, used sectio caesarea as a method of delivery. According to the maternal age, most mothers (125 or 83,3%) who underwent sectio caesarea were dominated by those under the healthy reproductive age group or those aged 20-35 years. Based on the maternal occupation, the majority of respondents (77 people or 77.0%) were housewives, whereas based on the history

of pregnancy, most mothers (91 people or 78.4%) with COVID-19 have more than 1 experience of pregnancy (multigravida). Meanwhile, related to the history of pregnancy, most mothers (146 people or 83.9%) with COVID-19 was dominated by those who have no more than two children. The Current mode of delivery and maternal age

According to Table 4, most respondents (150 people) in Bagas Waras Regional Public Hospital were classified in the healthy reproductive age between 20-35 years, 21 of whom (14%) underwent spontaneous delivery, 125 (83.1%) underwent section caesarea, and 4 (2.7%) underwent AVM. Likewise, previous research entitled "The Effect of Maternal Age Factors on the Methods of Delivery in Dr.H.Abdul Moeloek Regional Public Hospital, Lampung Province" conducted by Rani and Sari (2020) also argued that pregnant women classified in the high-risk age group (<20 years and >35 years) have twice the risk of abdominal delivery compared to those in the reproductive age (20-35 years).

The Current Mode of Delivery and Maternal Occupation

The majority of respondents (100 people) were housewives, 19 of whom (19.0%) experiencing spontaneous delivery, 77 people (77.0%) experiencing sectio caesarea, and 4 people (4.0%) experiencing AVM. The result of this research is in accordance to that conducted by Fitriyani et al. (2021), stating that 24.3% of respondents gave birth by using sectio caesarea and there were several determining factors related to the use of this particular method in Indonesia, one of which is the low level of income ($p = 0.02$).

The Current Mode of Delivery and the History of Pregnancy

This study revealed that most respondents (116 people) had multigravida, 20 (17.2%) of whom had spontaneous delivery, 91 people

(78.4%) had sectio caesarea, and 5 (4.3%) had AVM, as demonstrated in Table 4. This is in contrast to previous study which found no relation between gravida status and sectio caesarea as evidenced by the result of multiple logistic regression test with $p = 0.567$ ($p > 0,05$) (13).

The Current Mode of Delivery and the Number of Children

The respondents were dominated by those who have no more than 2 children (174 people), 22 of whom (12.6%) underwent spontaneous delivery, 146 (83.9%) underwent section caesarea, and 6 (3.4%) underwent AVM. The result is in line with that conducted by Evi Soviati (2016), stating that parity 2-3 is the safest parity for pregnancy and childbirth. Based on the incidence of maternal death, high parity (more than 3 children) has a higher incidence than that of lower parity (having 1 child); unpleasant birth experiences will affect the next delivery, while women who experience their first pregnancy will usually be haunted by myths about labor pain before delivery (14).

CONCLUSION AND RECOMMENDATION

There was adequate correlation between maternal age and the history of pregnancy in Bagas Waras Regional Public Hospital, Klaten, with P value = 0.0001 which indicates significant ($< 0,05$) and adequate correlation ($r = 0.259$) which exhibits that there is a relationship between the history of pregnancy and the number of children. Meanwhile, p -value 0.0001 which means significant ($< 0,05$) and adequate correlation ($r = 0.353$) indicates that there was a relationship between the number of children and maternal age. There was significant relationship between the characteristics of pregnant women with COVID-19 and the current mode of delivery at the Bagas Waras Hospital. Seggestioan, It is better to increase immunity for opregnant women in order to prepare for a safe delivery.

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