



**DETERMINANTS OF FACTORS AFFECTING MORTALITY OF PATIENTS
COVID-19 IN PREGNANT WOMEN IN PROVINCE WEST NUSA TENGGARA**

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ABSTRACT

In Indonesia, maternal mortality and neonatal mortality are big challenges and need attention in the Covid-19 disaster situation. This study aims to determine the determinants of factors that affect the mortality of Covid-19 patients in pregnant women in Province West Nusa Tenggara. The design of this study was a cross-sectional with purposive sampling technique, namely all pregnant, maternity and, postpartum women diagnosed with Covid-19 with PCR swab (+) who were treated in hospitals throughout the province of NTB during the period March to December 2020. Data collected through the register with a total sample of 163 people. The variables of this study were age, obstetric status, cluster, treatment status and, history of co-morbidities. Data were analyzed using bivariate analysis using Chi-Square and multivariate with Logistic Regression. The results of the study were that most of the mothers were aged 20-23 years (66.3%), obstetric status during the puerperium (58.3%), without cluster (97.5%), cured status (98.2%) and, without comorbidities. (97.5%). Maternal age and obstetric status did not show a significant relationship with their respective scores ($p=0.819$ and $p=0.808$), while clusters and comorbidities showed a significant relationship ($p=0.000$). Clusters and comorbidities are the most dominant in influencing mortality of Covid-19 patients in pregnant women and contributing 86.7%, the rest is influenced by other factors.

Keywords: covid-19; mortality; pregnancy

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INTRODUCTION

The government has determined non-natural disasters caused by Corona Virus or COVID-19 which have caused losses in various aspects of socio-economic life, which are widespread in Indonesia, besides that it greatly affects the health system, especially related to maternal and child health which causes increased maternal morbidity and mortality. The infectious disease caused by Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2) called Coronavirus Disease 2019 (COVID-19) is a new type of coronavirus that has never been previously identified in humans. Common symptoms of COVID-19 infection include acute respiratory symptoms such as fever, cough, and shortness of breath with an average incubation period of 5-6 days with the longest incubation period of 14 days. Severe cases of Covid-19 can lead to pneumonia, acute respiratory syndrome, kidney failure, and even death (PP POGI, 2020). COVID-19 infects about 4.9% of cases that occur in hospitalized pregnant women per 1000 mothers. These 233 (56%) pregnant women infected with SARS-CoV-2 were from the black group, 281 (69%) were obese, 175 (41%) were 35 years or older, and 145

(34%) had pre-existing comorbidities. previous. 266 (62%) suffered a miscarriage, 196 (73%) gave birth at term, 41 people (10%) needed respiratory support and 1 person (1%) died. 12 (5%) of the 265 infants tested positive for SARS-CoV-2 RNA (Knight et al., 2020)

In Indonesia based on the COVID-19 Distribution, maternal and neonatal deaths are still a big challenge and need attention in the Covid-19 disaster situation. Based on data from the Task Force for the Acceleration of Handling Covid-19 as of February 28, 2021, the number of confirmed patients nationally is 1,341,314 people and in NTB is 8,740 people. Data on pregnant women who were confirmed positive nationally were 3,390 (9.8%), and 0.3% of those who died. (Satgas, 2020). Pregnant women with Covid-19 based on the latest research discusses the clinical manifestations of maternal and perinatal care outcomes, as well as the potential for intrauterine vertical transmission. The reported data show similar symptoms to other populations and there is no evidence of vertical mother-to-child transmission and indicate a good prognosis for the majority of infected mothers and infants and the absence of serious obstetric complications in pregnant women with COVID-19 (Li et al. al., 2020).

The results of a study confirmed in the Swedish Laboratory show that the risk of ICU admission is higher in pregnant and postpartum women with SARS-CoV-2 compared with nonpregnant women of the same age, but the proportion of cesarean sections increases with prematurity with cesarean delivery (83, 9% in China; 35.9% in Spain, $p < 0.001$) (Collin et al., 2020; Cuñarro-López et al., 2021). Pregnant women have a higher risk of serious illness, morbidity, and mortality compared to the general population. Physiological changes during pregnancy have a significant impact on the immune system, respiratory system, cardiovascular function, and coagulation. The impact of SARS-CoV-2 on pregnancy is still being studied, and concerted global efforts are needed to determine effects on implantation, fetal growth and development, delivery, and neonatal health (Wastnedge et al., 2021).

Efforts that have been made by the government are to start adopting new habits so that they can live healthy lives in the COVID-19 pandemic situation. Adaptation of new habits must be done so that people can carry out daily activities so that they can avoid COVID-19. With the adaptation of new habits, it is hoped that people's rights to basic health can still be fulfilled. In addition, restrictions on micro-scale activities were also implemented by implementing 5M, namely using masks, washing hands with soap under running water, maintaining distance, staying away from crowds, and limiting mobilization and interaction. The existence of restrictions on activities in the community has an impact on all routine services, including maternal, and newborn health services, which are affected in terms of access and service quality. Restrictions on these activities have caused pregnant women to be afraid to go to health services for reasons of fear of infection, calls to postpone pregnancy check-ups and classes for pregnant women, and the lack of ready services in terms of facilities and infrastructure, including the lack of personal protective equipment.

Based on this background, researchers are interested in identifying the determinants of factors that affect the mortality of Covid-19 patients in pregnant women in West Nusa Tenggara Province. This study aims to identify characteristics (mother's age, obstetric status, cluster, history of treatment status, and comorbidities, then identify the relationship between characteristics and mortality of Covid-19 patients in pregnant women and analyze the factors that influence the incidence of mortality in Covid-19 patients in mothers). pregnant with Covid-19 in the province of NTB.

METHOD

The design used for this research is Cross-Sectional and has been declared to have passed research ethics No. LB.02.01/4.3/4697/2021. The population of this study was patients infected with Covid 19 based on the results of the PCR(+) Swab examination as many as 5848 patients. While the sample of this study was all pregnant, maternity, and postpartum women, who were diagnosed with Covid-19 as many as 163 patients with PCR Swab at the first examination and were treated in all hospitals in West Nusa Tenggara Province in 2020. Sampling was carried out purposively based on the register. medical records for the period from March to December 2020. The variables of this study were age, obstetric status, cluster, treatment status, and history of co-morbidities. Data were analyzed using bivariate analysis using Chi-Square and multivariate with Logistic Regression.

RESULTS

Descriptive Data Analysis Determinants of Factors Affecting the Mortality of Covid-19 Patients in Pregnant Women in West Nusa Tenggara Province in 2020 can be seen in table 2.1 below:

Table 1.
Descriptive Data Analysis of the Determinants of the Factors Affecting Mortality in Covid-19 Patients (n=163)

No	Variable	f	%
1	Age		
	<20 Years	15	9,2
	20-35 Years	108	66,3
	> 35 Years	40	24,5
2	Obstetric Status		
	Pregnant	48	29,4
	Maternity	20	12,3
	Childbirth	95	58,3
3	Cluster		
	No Cluster	159	97,5
	Health workers Cluster	4	2,5
4	Treatment Status		
	Get well	160	98,2
	Died	3	1,8
5	History of Participants		
	No Comorbits	159	97,5
	Comorbit	4	2,5

Based on Table 1, shows that most of the patients with Covid-19 pregnant women aged 20-35 years (66.3%), most of the obstetric status during the puerperium 95 people (58.3%), without a cluster of 159 people (97, 5%), recovered status after being treated for 160 people (98.2%) and a history of comorbidities without comorbidity of 159 people (97.2%). Obstetric history of patients with mothers with Covid - 19 in West Nusa Tenggara Province in 2020 can be seen in table 2.2. below this :

Table 2.
Descriptive Data of Obstetric History in Mothers with Covid - 19 (n=163)

No	RiwayatObstetri	f	%
1	gestational age is unclear	14	8.59
2	Curettage	11	6.75
3	1st Trimester of Pregnancy	2	1.23
4	2nd trimester of pregnancy	3	1.84
5	3rd trimester of pregnancy	30	18.40
6	Sectio caesarea	42	25.77
7	Inpartu	57	34.97
8	Post Partum Normal	4	2.45

Based on Table 2, it shows that most of the maternal obstetric history is mostly with labor at 57 (34.97%), Sectio Cesarea is 42 (25.77%), 3rd trimester pregnancy is 30 (18.40%), it is not clear age pregnancy was 14 (8.59%), curettage was 11 (6.75%), normal post partum was 4 (2.45%), second trimester pregnancy was 3 (1.84%) and first trimester pregnancy was 2 (1.23%). Descriptive Data on Diagnosis and Complaints in Mothers with Covid-19 in West Nusa Tenggara Province in 2020 can be seen in table 3 below:

Table 3.
Descriptive Data on Diagnosis and Complaints in Mothers with Covid – 19 (n=163)

No	Diagnosa / Keluhan	f	%
1	Hypokalemia	1	0.61
2	Perineal Rupture	1	0.61
3	Long second stage	1	0.61
4	Ectopic Pregnancy	1	0.61
5	Gemelli	1	0.61
6	Anosmia	2	1.23
7	Anemia	3	1.84
8	Oligohidramnion	4	2.45
9	the location of latitude/Lintang	5	3.07
10	Intra Uterine Fetal Distress (IUFD)	9	5.52
11	Sesak / Pneumonia	11	6.75
12	Abortus	11	6.75
13	Premature rupture of membranes	13	7.98
14	Pre Eklamsi Berat (PEB)	16	9.82
15	No complaints	84	51.53

Table 3, shows that most of the mothers were not accompanied by complaints of 84 (51.53%), while the diagnoses of mothers were mostly severe pre-eclampsia by 16 (9.82%), premature rupture of membranes was 13 (7.98%), Abortion was 11 (6.75%), dyspnoea and pneumonia were 11 (6.75%), and IUFD was 5 (5.52%). Analysis of Bivariate Data Determinants of Factors Affecting the Mortality of Covid-19 Patients in Pregnant Women in West Nusa Tenggara Province in 2020 can be seen in table 4 below:

Table 4.
Bivariate data analysis determinants of the factors Affecting Mortality in Covid-19 Patients (n=163)

No	Variabel	Sembuh		Meninggal		P value
		f	%	f	%	
1	Age					
	<20 Years	15	9,4	0	0	0,819
	20-35 Years	106	66,3	2	66,7	
	> 35 Years	39	24,4	1	33,3	
2	Obstetric Status					
	Pregnant	47	29,4	1	33,3	0,808
	Maternity	20	12,5	0	0	
	Childbirth	93	58,1	2	66,7	
3	Cluster					
	No Cluster	157	98,1	2	66,7	0,000
	Health workers Cluster	3	1,9	1	33,3	
4	Treatment Status					
	Get well	159	99,4	0	0	0,000
	Died	1	0,6	3	100	

Table 4, it shows that covid-19 patients in pregnant women were mostly aged 20-35 years 2 people (66.7%), during the postpartum period, namely 2 people (66.7%), without cluster 2 people (66.7%) and 100%. with comorbid. 1 health worker cluster out of 3 pregnant people is a co-orbiter who died from Covid-19. There is a significant relationship between clusters and comorbidities on the death of pregnant women infected with Covid-19. Multivariate Data Analysis Determinants of Factors Affecting the Mortality of Covid-19 Patients in Pregnant Women in West Nusa Tenggara Province in 2020 can be seen in table 2.5 below:

Table 5.
Multivariate data analysis determinants of the factors Affecting the Mortality of Covid-19 Patients (n=163)

No	Variable	Regression Coefficient	Score p	RR	95%CI
1	Mother's age	0,021	0,594	0,005	0,014 - 0,024
2	Obstetric Status	0,021	0,602	0,003	0,009 - 0,015
3	Cluster	0,082	0,048	0,071	0,001 - 0,142
4	Companion History	0,844	0,000	0,733	0,663 - 0,803

Score r =0,867

The cluster of pregnant women and comorbidities were the most dominant influencing mortality in pregnant women. Based on the analysis, a logistic regression model involving four variables affected the mortality of Covid-19 in pregnant women by 86.7%, the rest was influenced by other variables.

DISCUSSION

The results of this study are the same as several other studies, the average age of pregnant women with Covid-19 is 24-34 years. Seven pregnant patients with Covid-19 in the study had an average age of 32 years (range, 29-34 years). Another study showed the age of 23-40 years of 55 pregnant women with Covid who were treated. The age of pregnant women ranged from

20 to 44 years at the time of hospital admission (Khan et al., 2020; Yu et al., 2020; Remaeus et al. al., 2020; Dashraath et al., 2020; Juan et al., 2020).

One of the factors that make pregnant women susceptible to infection is the change in the immune system wherein pregnant women due to physiological changes in the body also change the dominance of T-helper (Th) 1 cell which is microbicidal and proinflammatory which produce cytokines such as interferon- γ (INF- γ) interleukin. (IL) -1 α . IL-1 β , IL-6 , and IL 12, change to a Th-2 predominance which is anti-inflammatory and includes IL-4, IL10, IL-13 ,and transforming growth factor - β (TGF- β), this condition causes an immunosuppressive state causing increased susceptibility pregnant women against intracellular pathogens such as viruses (Dashraath et al., 2020; Liu et al., 2020).

In addition, adaptive physiological conditions during pregnancy such as elevation of the diaphragm, increased oxygen consumption, limited lung expansion, and edema of the mucous membranes of the respiratory tract due to high levels of estrogen and progesterone can facilitate hypoxia (Chen et al., 2020). This study found that the obstetric status was a patient in the puerperium of 95 people (58.3%) in their study found that concerns about the risk of exposure to COVID-19, combined with the quarantine measures adopted during the COVID-19 pandemic, had a negative impact on mothers' thoughts and emotions. new, exacerbating depressive symptoms from the results of the Edinburgh Postnatal Depression Scale (EPDS) assessment on the second postpartum day (Zanardo et al., 2020).

Covid-19 infects regardless of lifestyle or biological factors. But it is more about travel history and with whom the patient had previous contact so that in this study it was found that there were no clusters of 159 people (97.5%). The covid-19 infection has shown detrimental effects on vulnerable people including pregnant women. However, pregnant women who suffer from covid-19 generally have no difference in clinical symptoms with the general population group who are not pregnant. The majority of pregnant women with covid-19 have mild clinical symptoms such as fever, cough , and dyspnea. Although in several studies it is said that pregnant women are physiologically immunosuppressed, it is estimated that the role of igg antibodies produced is higher in pregnant women. These igg antibodies act as a protective factor for pregnant women against covid-19, so clinical symptoms that arise will rarely manifest in a severe form (Yuliana, 2020).

Until now, research is still being conducted to determine the effects of COVID-19 infection on pregnancy, there is a real fear of the effects of COVID-19 on pregnancy, although not much information is available. So far, the priority of care for pregnant women has been to reduce the transmission of COVID-19 and provide safe care for those who are vulnerable to COVID-19 (Ncube, 2021). In this study, after treatment, 160 people (98.2%) had recovered status and 159 people (97.2%) had a history of comorbidity without comorbidity. Pregnant women do not appear to be at higher risk of developing severe COVID-19 infection. If the woman is already experiencing immune disorders due to other comorbidities such as diabetes, heart-lung disease, kidney disease then the disease may have increased morbidity. The Covid-19 pandemic has become a major challenge for maternal and other health workers as well as for pregnant women. Although the course of pregnancy is not much influenced by the disease itself, complications can arise if there is no timely and careful treatment. Both pregnant women and care providers should be vigilant and routine obstetric management should not be delayed due to testing or reporting of Covid-19 infection (Henry et al., 2020; Sentilhes et al., 2020).

There is a significant relationship between clusters and comorbidities on the mortality of pregnant women infected with Covid-19 and affects the mortality of Covid-19 in pregnant women by 86.7% based on the logistic regression model analysis as in Tables 2.4 and 2.5. The largest study reported from UKOSS shows that women may require hospitalization because of severe COVID-19 symptoms or for other reasons (childbirth or childbirth) but have fewer COVID-19 symptoms. The study shows the case fatality rate for pregnant women in the UK hospitalized with COVID-19 of 1.2% (95% CI 0.4–2.7%) and a SARS-CoV-2-related maternal mortality rate of 5, 6 (95% CI 1.8–13.1) per 100,000 deliveries. It also noted that a study from the UK had shown that the proportion of pregnant women who were hospitalized (6%) was similar to that of the general population, and that pregnancy was not associated with increased mortality (Knight et al., 2020; Liu et al., 2020).

This study is in line with the results of a study conducted by S. Khan et al (2020), that only two people infected with Covid-19 out of 17 contact with infected family members. Contacts with infected patients 15/17 (88%) the majority of individuals, including health care workers, contracted the infection within the hospital (Khan et al., 2020). There is a significant relationship between clusters and comorbidities on the mortality of pregnant women infected with Covid-19 and affects the mortality of Covid-19 in pregnant women by 86.7% based on logistic regression model analysis. In line with the results of this study, comorbidities are factors that affect the mortality of pregnant women with 2019 Coronavirus infection. The risk factors for morbidity in pregnant women are maternal age over 35 years, overweight or obesity accompanied by additional comorbidities resulting in acute respiratory syndrome severe ones (Molteni et al., 2020). In pregnant women, previous lung disease is the most dominant factor giving severe symptoms, heart disease, kidney disease, and diabetes are additional risk factors. The most common symptoms in hospitalized pregnant women were anemia in 63% of pregnant women and headache (72%), cardiopulmonary symptoms (62%), including persistent cough (80%), and chest pain (73%)(Molteni et al., 2020).

CONCLUSION

There is a relationship between clusters and co-morbidities of Covid-19 patients in pregnant women. This variable most dominantly affects the mortality of Covid-19 patients in pregnant women and contributes 86.7%, the rest is influenced by other factors.

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REFERENCES

- Chen, H., Guo, J., Wang, C., Luo, F., Yu, X., Zhang, W., Li, J., Zhao, D., Xu, D., Gong, Q., Liao, J., Yang, H., Hou, W., & Zhang, Y. (2020). Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *The Lancet*, 395(10226), 809–815. [https://doi.org/10.1016/S0140-6736\(20\)30360-3](https://doi.org/10.1016/S0140-6736(20)30360-3)
- Collin, J., Byström, E., Carnahan, A. S., & Ahrne, M. (2020). Public Health Agency of Sweden's Brief Report: Pregnant and postpartum women with severe acute respiratory syndrome coronavirus 2 infection in intensive care in Sweden. *Acta Obstetrica et Gynecologica Scandinavica*, 99(7), 819–822. <https://doi.org/10.1111/aogs.13901>
- Cuñarro-López, Y., Pintado-Recarte, P., Cueto-Hernández, I., Hernández-Martín, C., Payá-

- Martínez, M. P., Muñoz-Chápuli, M. del M., Cano-Valderrama, Ó., Bravo, C., Bujan, J., Álvarez-Mon, M., Ortega, M. A., & De León-Luis, J. A. (2021). The Profile of the Obstetric Patients with SARS-CoV-2 Infection according to Country of Origin of the Publication: A Systematic Review of the Literature. *Journal of Clinical Medicine*, 10(2), 360. <https://doi.org/10.3390/jcm10020360>
- Dashraath, P., Wong, J. L. J., Lim, M. X. K., Lim, L. M., Li, S., Biswas, A., Choolani, M., Mattar, C., & Su, L. L. (2020). Coronavirus disease 2019 (COVID-19) pandemic and pregnancy. *American Journal of Obstetrics and Gynecology*, 222(6), 521–531. <https://doi.org/10.1016/j.ajog.2020.03.021>
- Henry, B. M., Children, C., & Vikse, J. (2020). Clinical Characteristics of Covid-19 in China. *New England Journal of Medicine*, 382(19), 1859–1862. <https://doi.org/10.1056/nejmc2005203>
- Juan, J., Gil, M. M., Rong, Z., Zhang, Y., Yang, H., & Poon, L. C. (2020). Effect of coronavirus disease 2019 (COVID-19) on maternal, perinatal and neonatal outcome: systematic review. *Ultrasound in Obstetrics and Gynecology*, 56(1), 15–27. <https://doi.org/10.1002/uog.22088>
- Khan, S., Jun, L., Nawsherwan, Siddique, R., Li, Y., Han, G., Xue, M., Nabi, G., & Liu, J. (2020). Association of COVID-19 with pregnancy outcomes in health-care workers and general women. *Clinical Microbiology and Infection*, 26(6), 788–790. <https://doi.org/10.1016/j.cmi.2020.03.034>
- Knight, M., Bunch, K., Vousden, N., Morris, E., Simpson, N., Gale, C., O'Brien, P., Quigley, M., Brocklehurst, P., & Kurinczuk, J. (2020). Characteristics and outcomes of pregnant women hospitalised with confirmed SARS-CoV-2 infection in the UK: a national cohort study using the UK Obstetric Surveillance System (UKOSS). *Bmj*, 1–22. <https://doi.org/10.1101/2020.05.08.20089268>
- Li, W., Yu, N., Kang, Q., Zeng, W., Deng, D., Chen, S., Feng, L., & Wu, J. (2020). Clinical manifestations and maternal and perinatal outcomes with COVID-19. *American Journal of Reproductive Immunology*, 84(5). <https://doi.org/10.1111/aji.13340>
- Liu, H., Wang, L., Zhao, S., Kwak-kim, J., Mor, G., & Liao, A. (2020). Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19 . The COVID-19 resource centre is hosted on Elsevier Connect , the company ' s public news and information . January.
- Molteni, E., Astley, C. M., Ma, W., Sudre, C. H., Magee, L. A., Murray, B., Fall, T., Gomez, M. F., Tsereteli, N., Franks, P. W., Davies, R., Wolf, J., Spector, T. D., Ourselin, S., Chan, A. T., & Modat, M. (2020). SARS-CoV-2 (COVID-19) infection in pregnant women: characterization of symptoms and syndromes predictive of disease and severity through real-time, remote participatory epidemiology. *MedRxiv*, 2020.08.17.20161760. <https://doi.org/10.1101/2020.08.17.20161760>
- Ncube, M. (2021). COVID-19 and antenatal care: An update. *European Journal of Midwifery*, 5(March), 1–2. <https://doi.org/10.18332/ejm/132882>
- PP POGI. (2020). Rekomendasi Penanganan Infeksi Virus Corona (Covid-19) Pada Maternal (Hamil, Bersalin dan Nifas). *Maret*, 1–28. <https://pogi.or.id/publish/wp->

content/uploads/2020/03/Rekomendasi-Penanganan-Infeksi-COVID-19-pada-maternal.pdf

- Remaeus, K., Savchenko, J., Brismar Wendel, S., Brusell Gidlöf, S., Graner, S., Jones, E., Molin, J., Saltvedt, S., Wallström, T., & Pettersson, K. (2020). Characteristics and short-term obstetric outcomes in a case series of 67 women test-positive for SARS-CoV-2 in Stockholm, Sweden. In *Acta Obstetrica et Gynecologica Scandinavica* (Vol. 99, Issue 12, pp. 1626–1631). <https://doi.org/10.1111/aogs.14006>
- Satgas. (2020). *Peta Sebaran COVID-19* | *Covid19.go.id*. <https://covid19.go.id/peta-sebaran-covid19>
- Sentilhes, L., De Marcillac, F., Jouffrieau, C., Kuhn, P., Thuet, V., Hansmann, Y., Ruch, Y., Fafi-Kremer, S., & Deruelle, P. (2020). Coronavirus disease 2019 in pregnancy was associated with maternal morbidity and preterm birth. *American Journal of Obstetrics and Gynecology*, 223(6), 914.e1-914.e15. <https://doi.org/10.1016/j.ajog.2020.06.022>
- Wastnedge, E. A. N., Reynolds, R. M., van Boeckel, S. R., Stock, S. J., Denison, F. C., Maybin, J. A., & Critchley, H. O. D. (2021). Pregnancy and COVID-19. *Physiological Reviews*, 101(1), 303–318. <https://doi.org/10.1152/physrev.00024.2020>
- Yu, N., Li, W., Kang, Q., Xiong, Z., Wang, S., Lin, X., Liu, Y., Xiao, J., Liu, H., Deng, D., Chen, S., Zeng, W., Feng, L., & Wu, J. (2020). Clinical features and obstetric and neonatal outcomes of pregnant patients with COVID-19 in Wuhan, China: a retrospective, single-centre, descriptive study. *The Lancet Infectious Diseases*, 20(5), 559–564. [https://doi.org/10.1016/S1473-3099\(20\)30176-6](https://doi.org/10.1016/S1473-3099(20)30176-6)
- Yuliana, L. W. (2020). Karakteristik gejala klinis kehamilan dengan Coronavirus disease (COVID-19). *Jurnal Ilmiah Kesehatan Sandi Husada*, 12(2), 726–734. <https://doi.org/10.35816/jiskh.v12i2.397>
- Zanardo, V., Manghina, V., Giliberti, L., Vettore, M., Severino, L., & Straface, G. (2020). Psychological impact of COVID-19 quarantine measures in northeastern Italy on mothers in the immediate postpartum period. *International Journal of Gynecology & Obstetrics*, 150(2), 184–188. <https://doi.org/10.1002/ijgo.13249>

