



ORIGINAL ARTICLE

PREGNANCY OUTCOME AT PRIMARY HEALTHCARE CENTERS WITH BASIC EMERGENCY NEONATAL OBSTETRIC SERVICES DURING COVID-19 PANDEMIC

Luaran Persalinan Masa Pandemi COVID-19 di Pusat Kesehatan Masyarakat Pelayanan Obstetri Neonatal Emergensi Dasar

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ABSTRACT

Background: This unending Coronavirus Disease 2019 (COVID-19) pandemic which worsens by various mutation findings, has brought about several changes across various sectors, including in health service sectors. Meanwhile, in particular, antenatal visits and childbirth cannot be separated. **Purpose:** This study was conducted to compare the pregnancy outcome differences before and during the pandemic. **Methods:** This cross-sectional study investigated antenatal visits, obstetric complications, postpartum conditions, and maternal motivation to undertake antenatal visits reviewed from the birth reports and medical records of mothers who gave birth and took antenatal care at primary healthcare centers in Surabaya, Indonesia, during January to July 2019 and January to July 2020. The total sampling method included 381 samples out of 688 mothers. Mann-Whitney U test was used for analysis to perceive the differences in conditions before and during the pandemic. **Results:** Statistical analyses showed no significant differences (p -value > 0.05) in the number of antenatal visits ($p = 0.09$), obstetric complication ($p = 0.10$), postpartum condition ($p = 1.00$), and maternal motivation in undergoing antenatal visits ($p = 0.87$). The most common obstetric complication was postpartum hemorrhage. **Conclusion:** This study establishes that there are no differences in the incidence of complications, postpartum conditions, antenatal visits, and maternal motivation before and during the pandemic.

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ABSTRAK

Latar belakang: Pandemi Coronavirus Disease 2019 (COVID-19) yang tidak diketahui kapan akan berakhirnya ini telah membuat perubahan dalam beberapa aspek kehidupan, termasuk pada bidang pelayanan kesehatan, sedangkan kunjungan antenatal dan persalinan merupakan dua hal yang tidak dapat dipisahkan. **Tujuan:** Studi ini dilakukan untuk membandingkan luaran persalinan sebelum dan saat pandemi. **Metode:** Studi cross-sectional ini mempelajari kunjungan antenatal, komplikasi obstetri, keadaan pascasalin, dan motivasi maternal dalam melakukan kunjungan antenatal yang didapatkan dari data register persalinan dan rekam medis ibu hamil yang bersalin dan melakukan kunjungan antenatal di Puskesmas PONEB Surabaya pada bulan Januari hingga Juli 2019 dan Januari hingga Juli 2020. Metode total sampling digunakan dalam mendapatkan 381 sampel dari 687 populasi ibu. Analisis menggunakan uji beda Mann-Whitney U test dilakukan untuk mengetahui perbedaan kejadian antara sebelum dan saat pandemi. **Hasil:** Analisa statistik tidak menunjukkan adanya perbedaan yang signifikan (p -value > 0.05) dengan jumlah kunjungan antenatal sebesar ($p = 0.09$), komplikasi obstetri sebesar ($p = 0.10$), keadaan pascasalin sebesar ($p = 1.00$), dan motivasi maternal dalam melakukan kunjungan antenatal sebesar ($p = 0.87$). Komplikasi obstetri yang banyak ditemukan adalah perdarahan pascasalin. **Kesimpulan:** Studi ini menemukan bahwa tidak didapatkan perbedaan kejadian kunjungan antenatal, komplikasi obstetri, keadaan pascasalin, serta motivasi maternal pada masa pandemi.

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INTRODUCTION

Optimum pregnancy outcome depends on many factors, such as acceptable, affordable, accessible, high-quality maternal care during pregnancy, childbirth, and the postnatal period (Tunçalp et al., 2015). Approximately 303,000 women died in 2015. The maternal mortality ratio in Indonesia is 190 maternal deaths per 100,000 live births. Meanwhile, the MDGs target is 102 maternal deaths per 100,000 live births (Dewi, Bakti, & Supriyatningsih, 2019).

An obstetric complication is an acute condition arising from either a direct or indirect cause of maternal death. Direct obstetric complications include haemorrhage (10.69%), preeclampsia or eclampsia (11.63%), sepsis (2.15%), prolonged labor (23.34%), abortion (3%), ectopic pregnancy (2.65%), ruptured uterus (2.23%), and retained placenta (3.24%). Indirect obstetric complications are anemia, malaria, and

other exacerbation of pre-existing maternal conditions (Geleto, Chojenta, Taddele, & Loxton, 2020).

The presence of Coronavirus Infection Disease 19 (COVID-19) and social restrictions made pregnant women face an additional dilemma in which they need professional antenatal care, but there is a potential risk for cross-infection if they choose to visit a hospital to receive this service (Wu et al., 2020). Based on the latest guidelines regarding antenatal visits during the pandemic, pregnant women are recommended to make only two visits, once in the first trimester to confirm pregnancy and in the last trimester to prepare for delivery (Ministry of Health RI, 2020b).

A reduced number of antenatal appointments to a minimum of two during the pandemic in Indonesia may result in worse pregnancy outcomes. This matter is in line with the research conducted by Saputri, Anbarani, Toyamah, & Yumna (2020), the decline in maternal services

can potentially indirectly affect a mother's health status during pregnancy, which may increase maternal and infant mortality rates. This research is expected to be able to provide information related to the impact of the pandemic on delivery outcomes, obstetric complications, and postpartum conditions, as well as the implementation of antenatal visits and maternal motivation in conducting antenatal visits.

METHODS

This research was a cross-sectional study based on the birth report and medical records data. This study population was all pregnant mothers who gave birth and did antenatal care in Jagir, Banyu Urip, and Simomulyo primary healthcare center (PHC), Surabaya, from January-July 2019 and January-July 2020. The study sample included a population with complete data on antenatal care, obstetric complication, and postpartum condition. In contrast, those with missing data were excluded from the study sample. The total sampling method was used to include all populations that meet the inclusion and exclusion criteria of this study. The minimum sample size for this study was 384 samples after being calculated using the cross-sectional survey formula with a 5% margin of error and 95% confidence level. Komite Etik Penelitian Kesehatan Fakultas Kedokteran Universitas Airlangga had ethically approved this study (33/EC/KEPK/FKUA/2021).

The research was conducted in three healthcare centers in Surabaya, Jagir, Banyu Urip, and Simomulyo Primary Healthcare Centers (PHC). Surabaya is one of the largest cities in Indonesia, with a population of more than 3 million people (Ulfah, Budisusanto, & Hidayat, 2019).

The data taken in this study were birth records (obstetric complications, postpartum conditions, and medical record numbers) from the labor registry and records of the number and anamnesis of antenatal visits from medical records. Antenatal visits data were grouped into < 4 times or ≥ 4 times visits. Data of obstetric complications were grouped into prolonged labor, postpartum hemorrhage, premature rupture of membranes, preeclampsia, sepsis, and other complications. Postpartum conditions data were categorized into three: alive, death with complications, and death

without complications. Data were obtained from anamnesis at each antenatal visit to determine maternal motivation in conducting antenatal visits. Maternal motivation data were grouped between with or without danger signs of pregnancy found on medical records. Severe nausea and vomiting, heavy bleeding, decreased fetal movement, ruptured membranes, severe headache, high blood pressure, repeated contractions, and seizures were considered dangerous signs. ANC without danger signs means that the mother only carried out routine ANC, whereas if there were pregnancy danger signs, the mother has limited visits only to danger signs.

This study took samples in 3 healthcare centers and found 687 pregnant women who gave birth, precisely 373 from Jagir, 133 from Banyu Urip, and 181 from Simomulyo. After excluding 307 pregnant women with an incomplete record (44.62%), this study consists of 381 pregnant women. There were 191 from Jagir, 78 from Banyu Urip, and 112 from Simomulyo.

All collected data were inputted and analyzed using Mann-Whitney U tests to compare antenatal visits, obstetric complications, postpartum conditions, and maternal motivation in both years. It was because data inputted were generally not distributed and categorized as non-parametric data. All descriptive statistics were presented as frequencies and percentages by year. For all analyses conducted in the study, $p < 0.05$ was considered statistically different.

RESULTS

Figure 1 shows 298 deliveries in 2019 and 389 deliveries in 2020. From all deliveries recorded, deliveries mainly were found (21.85%) in April 2020 (see Figure 2). Deliveries in 2019 fluctuated and were mostly found (20.47%) in March 2019. Table 1 showed that < 4 times antenatal visits occurred more frequently in 2019 (54.71%), while ≥ 4 times antenatal visits were obtained more in 2020 (54.03%). Trends of ≥ 4 times antenatal visits increased compared to the previous year (see Figure 3). The different tests of antenatal visits between the two years using Mann Whitney showed no significant difference ($p = 0.09$).

Table 1
Variable distribution for January-July 2019 and January-July 2020

Variable	Year				p-value
	2019		2020		
	N	%	n	%	
Antenatal Visit (times)					
< 4	93	54.71	97	45.97	0.09
≥ 4	77	45.29	114	54.03	
Obstetric Complication					
No complication	138	81.18	158	74.88	0.10
Prolonged labor	4	2.35	7	3.32	
Postpartum hemorrhage	23	13.53	26	12.32	
Premature rupture of membrane	1	0.59	7	3.32	
Preeclampsia	0	0.00	9	4.27	
Sepsis	0	0.00	0	0.00	
Others	4	2.35	4	1.89	
Postpartum Condition					
Alive	170	100.00	211	100.00	1.00
Death with complication	0	0.00	0	0.00	
Death without complication	0	0.00	0	0.00	
Maternal Motivation					
With danger sign	7	4.12	8	3.79	0.87
Without danger sign	163	95.88	203	96.21	
Total	170	100.00	211	100.00	

The most prevalent incidence of obstetric complications in 2019 and 2020 (see Table 1) was postpartum hemorrhage (13.53% and 12.32%, respectively). Prolonged labor, premature rupture of membrane, and preeclampsia have increased since 2019 (see Figure 4). This study found other complications were macrosomia, Partus Prematurus Imminents (PPI), and postdate with a decreased percentage of incidence compared to 2019. Mann Whitney test for obstetric complication differences between both years showed no significant difference ($p = 0.10$).

The condition of postpartum mothers (see Table 1) most commonly found in 2019 and 2020 is alive with a percentage of 100% in both years. The postpartum condition difference test between both years using Mann Whitney showed no difference in incidence ($p = 1.00$).

Antenatal visits without danger signs (see Table 1) were mostly done, with 95.88% in 2019 and 96.21% in 2020. Danger signs that are most complained about by mothers are severe nausea and vomiting, decreased fetal movement, and ruptured membranes. The different tests of maternal motivation between both years using Mann Whitney showed no difference in incidence ($p = 0.87$).

DISCUSSION

Pregnancy cannot be separated from Antenatal Care (ANC). ANC is an examination carried out during pregnancy. The study revealed that ANC is important for maternal and child health. Thus, it can affect pregnancy outcomes. Optimal ANC examinations were proven to reduce maternal and newborn mortality and morbidity (Shiferaw, Mengiste, Gobena, & Dheresa, 2021). Effective ANC visits help to promote a healthy lifestyle, detect and treat any preexisting diseases, counsel, and even support mothers who may be suffering from domestic violence (Uwambaye et al., 2020).

This study result revealed different deliveries at each of the three healthcare centers. The difference in the birth rate between 2019 and 2020 at each healthcare center can give a different meaning. The increasing number of deliveries at the Jagir and Simomulyo healthcare centers can be caused by the fact that the number of the female population is different from the previous year. Based on the research conducted by Ulfah, Budisusanto, & Hidayat (2019), the women's ratio in Surabaya has increased gradually from 2009 to 2017. The finding of an increase in the birth rate at these two healthcare centers is in line with the findings of reporting of births in Jakarta, which increased between January-September 2020, with

the highest increase occurring in the May-June period (Irawan, 2020).

There was a decrease in the birth rate at Banyu Urip healthcare center. It is in line with the number of births in Indonesia which found that births in 2019 had decreased compared to 2018 (Ministry of Health RI, 2018, 2020a). The decline in the birth rate at Banyu Urip healthcare center could be due to pregnant women preferring having a birth at a healthcare center with advanced higher facilities than the primary healthcare center. Based on Riskesdas data in 2018, the proportion of births in primary healthcare centers was only 12.10%, while in clinics/practices of health workers was 34.50%, in hospitals 32.70%, and in non-healthcare facilities (home) 16.70% (Ministry of Health RI, 2020a). These findings may also be caused by other factors such as differences in population and loss of birth register data, which were not further investigated.

Antenatal Visit

During the pandemic in 2020, at primary healthcare centers, antenatal visits mainly could only be accessed by direct examinations as examinations via telemedicine were not yet available. Antenatal visits in 2020 were primarily found ≥ 4 times, while in 2019, antenatal visits were mostly done < 4 times. This data showed that antenatal visits ≥ 4 times increased by approximately 48%. A similar result was also reported by Izati (2018), that the trend of antenatal visits for pregnant women ≥ 4 times (K4) from 2011 to 2015 has increased. Cameron, Suarez, & Cornwell (2019) mentioned that the use of antenatal care in Indonesia has increased by approximately 14% from 1986 to 2012. Increased maternal health literacy and improved staff communication skills could become the factors of increased antenatal visit findings in this study. It is in line with the research by Alanazy & Brown (2020), which stated that antenatal care attendance was associated with the mother's health literacy and beliefs, followed by healthcare staff communication skills.

No significant difference in antenatal visits before and during the pandemic on the Mann Whitney test was possibly caused by the lack of the mother's knowledge regarding the new guidelines of antenatal visits. It is in accordance with Ariestanti, Widayati, & Sulistyowati (2020), who said that mothers' behavior in conducting antenatal visits during a pandemic was influenced by their knowledge. According to Herdiani &

Rosiana (2020), health workers have an important role in providing information to their patients. Mothers may not be aware of the Ministry of Health's standards for prenatal visits during a pandemic, which could result in 2020 antenatal visits being the same as 2019 antenatal visits due to a lack of information from the health workers.

The implementation of health protocols as one of the efforts to prevent COVID-19, such as washing hands, is still not carried out properly in most of the community (Pinasti, 2020). As many as 78% of pregnant women have less knowledge about the transmission prevention of COVID-19 during pregnancy before being given counseling (Aritonang, Nugraeny, Sumiatik, & Siregar, 2020). In this case, we finally comprehend that the problem experienced by pregnant women during a pandemic is the lack of information regarding the new guidelines issued to adjust to the pandemic situation, which may result in no significant difference in antenatal visits compared to the previous year. It is also possible that there are other factors, such as good awareness in maintaining health protocols to prevent the spread of COVID-19 in the community around Jagir, Banyu Urip, and Simomulyo Healthcare Center. This effort is useful in building the mother's confidence in conducting antenatal visits which was not investigated further.

Obstetric Complication

This study result revealed that postpartum hemorrhage was the most common obstetric complication (see Table 1). It is in line with the research conducted by Reale, Easter, Xu, Bateman, & Farber (2020), who also found that the incidence of postpartum hemorrhage rates increased by 13%. The incidence of preeclampsia was also found to increase compared to 2019. This matter is in accordance with previous research in Ethiopia that found a 154% increase in the incidence of preeclampsia from 2009 to 2013 (Wagnew, Dessalegn, Worku, & Nyagero, 2016).

According to a study by Zainiyah & Susanti (2020), 44.30% of pregnant women experience severe anxiety due to the COVID-19 pandemic. This anxiety can develop into pathological anxiety and cause complications for the mother and the fetus in the womb. Anxiety during pregnancy due to a pandemic can increase the possibility of complications, so it can increase the complication rate during a pandemic. Pregnancy with risk factors has a three times greater risk of developing pregnancy complications (Mariyona, 2019).

Around 10%-30% of global pregnancies are estimated to be at risk of developing obstetric complications (Rajbanshi, Norhayati, & Hazlina, 2021). According to Evensen, Anderson, & Fontaine (2017), postpartum hemorrhage can occur in patients without risk factors for hemorrhage, and around 20% of PPH occurs in women with no risk factors. A study reviewed by Hawker & Weeks (2020), also showed that antenatal risk factors might not significantly contribute to the PPH rates while the method of birth could have more impact. It means that mothers can develop obstetric complications even with no risk factors.

The findings of antenatal visits that are not much different from each year can also make the detected complications not too different. A research conducted by Aritonang, Nugraeny, Sumiatik, & Siregar (2020), found that as many as 64.90% of pregnant women had less knowledge regarding the transmission of COVID-19 before being given counseling. Alanazy & Brown (2020) mentioned that women who believe they are at risk for severe complications are more likely to undertake antenatal visits. Meanwhile, the fear itself may result in individuals to avoid thinking of health issues and lead to avoiding appointments or even still carrying it out as they are highly concerned. It is possible that mothers still carried out antenatal visits despite their poor knowledge regarding COVID-19 transmission and worry about their pregnancy as they were more likely concerned about their pregnancy and resulting in no obstetric complication significant difference. These findings are in contrast to the previous study conducted by Bantas, Aryastuti, & Gayatri (2019). They found that antenatal visits were associated with the incidence of childbirth complications. Mothers who had < 4 times antenatal visits tended to experience labor complications by 1.30 times compared to mothers who made antenatal visits \geq 4 times.

Postpartum condition

Global causes of maternal deaths in South-East Asia were 83% due to direct obstetric causes, while 17% were due to indirect causes (Cameron, Suarez, & Cornwell, 2019). Based on the data on postpartum conditions, in January-July 2019 and 2020, no cases of maternal death were found, or all postpartum conditions (100%) were alive. Cameron, Suarez, & Cornwell (2019), in their research, also mentioned that a skilled birth attendant (SBA), along with the availability of

medical supplies (e.g., blood transfusion), is the survival key in an emergency situation when dealing with delivery complications.

As primary healthcare centers, Jagir, Banyu Urip, and Simomulyo healthcare centers have a referral system as. It is because, according to Nestelita, Suryoputro, & Kusumastuti (2019), every delivery case that cannot be handled at Primary healthcare for obstetric emergency cases center will be referred to comprehensive obstetric emergency cases Hospital. After that, stabilization and initial management are carried out. According to Suparman (2020), it is possible to improve the quality of service programs as well as the effectiveness and efficiency of the referral system to reduce maternal mortality. Skilled health workers and complete facilities and infrastructure are also needed to optimize the referral process. Dewi, Bekti, & Supriyatningsih (2019) also stated that along with the referral system, good communication between referrers and health workers in referral hospitals plays an important role in reducing the risk of referral to pregnant women.

These findings make it possible that no cases of maternal death were found at Primary healthcare for obstetric emergency cases center and make it no significant differences in Mann Whitney test compared to the previous year. It is because every case with high risk and not under the authority of Primary healthcare for obstetric emergency cases center will be referred. Also, it indicates that the referral process at the Primary healthcare for obstetric emergency cases center has gone quite well. Emergency preparation also makes the health workers can perform adequate resuscitation for needed mothers.

Maternal motivation

From the data obtained, most ANC examinations did not find any danger signs both before and during the pandemic. It means that pregnant women continue to carry out routine pregnancy checks without being limited to danger signs even during the pandemic, and the implementation of ANC is not following the guidelines from the Ministry of Health.

Good knowledge of pregnant women about the health of their pregnancy will affect their motivation to make ANC visits (Rachmawati, Puspitasari, & Cania, 2017). No significant differences in maternal motivation in antenatal visits in this study indicate that the mother's knowledge regarding the health of her pregnancy

is pretty good. The development of maternal motivation in antenatal visits is necessary so that mothers become more enthusiastic about conducting antenatal visits. It should be noted that during a pandemic, mothers still have to maintain their health by complying with the recommendations of the Ministry of Health regarding antenatal visits to the healthcare center and always maintaining communication with their preferred health workers while not making visits.

Research Limitation

This current research is limited to only three healthcare centers, and it can limit our findings representatively. The cross-sectional study design also limits us from explaining the causes of each variable's finding. It can also be influenced by other factors, such as family support, distance from the healthcare center, and economic status, which were not further examined in this study. This study also depends on the quality of secondary data, limiting us from including other incomplete and missing data.

CONCLUSION

Antenatal visits, obstetric complications, postpartum conditions, and maternal motivation did not experience any difference between before and during the pandemic in Surabaya. Health workers are needed to provide more effective education related to the implementation of correct health protocols as well as socializing the latest guidelines so that the public can accept, understand, and do according to the rules. In order to ensure the most effective implementation of the guidelines, the government must also provide telemedicine in healthcare facilities.

CONFLICT OF INTEREST

The authors declare that we have no competing interests.

AUTHOR CONTRIBUTIONS

The authors were involved as follows: NMM, BP, BU conceptualization; NMM, BP, BU design; NMM data acquisition; NMM, BU analysis, and interpretation; NMM input into drafting article; NMM, BP, and BU were responsible for revision and final approval of the manuscript.

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