

Improving pregnancy care during the COVID-19 pandemic for pregnant women as vulnerable groups through assistance at the primary health care facility

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SUBMITTED: 25 October 2020

REVISED: 3 February 2021

ACCEPTED: 15 April 2021

KEYWORDS

Smartphone application
Pregnant women
Pregnancy care
COVID-19
Primary health care

ABSTRACT Since it was found in December 2019, the novel Coronavirus Disease 2019 (COVID-19) has spread from Wuhan, China, to many other countries. A rapid increase of newly found cases was observed, and finally, in March 2020, the World Health Organization declared that Coronavirus Disease 2019 (COVID-19) is a global pandemic. As one of the vulnerable groups, pregnant women need to avoid COVID-19 transmission and maintain pregnancy health during the pandemic. This study aimed to improve pregnant women's self-management during the COVID-19 pandemic in the working area of the Padangsari Primary Health Care Services, Semarang City. The research method used an experimental design with a pre-posttest without a control group. A Smartphone application, namely "SEHARI," was used to share the module and video about pregnancy health guidelines; furthermore, various activities of this study included online classes for pregnant women via a WhatsApp group, pregnancy care behavior surveys, and evaluations. The offline activity was done in 1 meeting for 90-120 minutes, while online activities were done as needed. This study's target population was 22 pregnant women in Puskesmas Padangsari Semarang City's working area selected by purposive sampling. A questionnaire was used that measures mother's behavior while engaging in pregnancy care and pregnancy examination screening. The validity and reliability tests showed that the instrument was valid and reliable to improve self-management of pregnant women during the COVID-19 pandemic in the working area. Bivariate data analysis of the independent variable's effect on the dependent variables used paired and independent t-tests to measure the self-management of pregnant women. The results showed that 50% of pregnant women fulfilled nutritional needs well, 59.1% of pregnant women did tetanus immunization, and 59.1% did pregnancy examinations and visits. Despite being a vulnerable group, pregnant women must continue their antenatal care during the pandemic with a strict health protocol. Specially designed online classes and Smartphone application can be used as media to deliver the essential health messages so that pregnant women can still monitor their pregnancy health and have a way to bridge the existing programs in primary health care.

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1. Introduction

The Maternal Mortality Rate (MMR) is one indicator of public health and the development of a nation in every country, including Indonesia. The MMR describes the number of deaths in women due to pregnancy disorders or their management during pregnancy, childbirth, and the puerperium (excluding accidents or incidental cases) without considering the length of pregnancy per 100,000 live births. MMR is also used to monitor mortality during pregnancy,

associated with health status, education, and services during pregnancy and childbirth.¹ Therefore, MMR's sensitivity and its association with health services improvement indicate the success of the health sector development and still represents a significant concern of both central and local governments.²

Pregnancy is a process that begins with conception and ends with labor. The pregnancy term increases estrogen and progesterone, which can affect the mothers' and their baby's condition. Moreover, these conditions can be observed through increased blood flow to the uterus, breast, vagina, cardiovascular system, urinary tract, respiration, integument, and endocrine system.

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Meanwhile, pregnant women need to develop a good understanding and adaptation according to the changes that occur during the pregnancy. Therefore, lack of information about physiological changes due to pregnancy may cause the mother to experience difficulties in the early detection of high-risk pregnancy.³

Besides, the high-risk pregnancy is sometimes caused by a lack of understanding of reproductive health related to the low level of education, social and economic status, and the lack of utilization of health service facilities. Sufficient knowledge of high-risk pregnancies will encourage pregnant women to get regular prenatal checks. Moreover, pregnant women also need to understand the needs of nutrition, personal hygiene, and sleep rest to prevent pregnancy complications and maintain health status. Another factor that affects pregnancy is the age of the pregnant woman. Mothers who are pregnant during the reproductive period will have a lower risk during pregnancy than mothers who are pregnant below or above the reproductive age.⁴ Various programs or interventions need to be designed and implemented to reduce MMR.

Various ways to reduce MMR can be done through preventive and promotive measures with a continuous community empowerment approach. One strategy that can be conducted is health education for pregnant women about monitoring of pregnancy health status, including pregnancy danger signs; ways of dealing with pregnancy complaints; adapting to changes in pregnancy; childbirth; postpartum care; baby care; myths; related infectious diseases; issuing birth certificates and baby's health.⁵ Several previous studies have explained that health education can increase pregnant women's knowledge about pregnancy screening and monitoring. Moreover, a good understanding or experience will also support good efficacy and self-management.⁶

Community empowerment related to MMR aims to increase the active participation of health cadres, health workers' allies in the community and accelerate problem-solving concerning maternal and child health in the community.⁷ Health cadres act as pregnancy health promoters responsible for providing health education, monitoring maternal

and child health, recording and reporting baby births, while mobilizing people to adopt a clean and healthy lifestyle, and making referrals if necessary.⁸ Therefore, these assistance activities need to be done from pregnancy to childbirth. Several previous studies stated that community empowerment efforts through optimizing health cadres' role increased the knowledge, attitudes, and behavior of pregnant women about pregnancy self-management. Nurses must meet the needs of pregnancy health education through community empowerment, especially during the COVID-19 pandemic.⁹

Based on the previous coronavirus pandemic cases, namely SARS-CoV and MERS-CoV, pregnant women are the vulnerable group that needs more attention during the crisis. Nurses must ensure that pregnancy checks are done regularly by following strict health protocols. To date, only a few studies explain the transmission of COVID-19 from mother to the baby during pregnancy or childbirth, the puerperium, and breastfeeding. However, it is necessary to prevent virus transmission based on established health protocols. A possible preventable negative impact is a preterm delivery in pregnant women with COVID-19 infection.¹⁰

Based on the Indonesian Obstetrics and Gynecology Association (POGI) report in 2020, 18 cases of pregnancy with COVID-19 infection occurred in the third trimester, with similar clinical findings were obtained in pregnant women as in non-pregnant adults.¹¹ Furthermore, fetal distress and preterm delivery were found in some cases. In two instances, cesarean delivery was performed, and testing for SARS-CoV-2 was found to be negative in all infants examined. According to the *Korea Herald* (9/3/2020), eight pregnant women who contracted COVID-19 were placed in Daegu and Busan's isolation rooms. One pregnant woman in Daegu gave birth, and the baby was confirmed negative for COVID-19.¹² Based on this situation, there is no data and evidence that the transmission of COVID-19 occurs through mother to fetus during pregnancy or childbirth.

According to the World Health Organization (WHO) in 2020, the clinical symptoms of COVID-19 reported by pregnant women are similar to those in other patients. Furthermore, out of the 147

pregnant women, 8% had severe clinical symptoms, and 1% was in critical condition.¹³ The clinical signs that appeared included fever (78%), cough (44%), muscle aches (33%), general weakness (22%), shortness of breath (11%), and sore throat (22%). It will be more suspicious if pregnant women have a history of traveling to affected areas within the last 14 days or have had contact with people who have been confirmed positive of COVID-19. Therefore, pregnant women are expected not to panic and should be always aware and make efforts to prevent the transmission of COVID-19.¹⁰ The instability of pregnant women's physical and psychological conditions will affect their health during pregnancy, childbirth, and the puerperium. Accordingly, immediate efforts are needed to minimize this impact by assisting pregnant women.

Assistance is a process of providing health aids by assistants to clients in identifying needs, solving problems, and encouraging the growth of initiative in the decision-making process to obtain sustainable client independence.⁴ The activities of assisting pregnant women that have been done consist of disseminating independent pregnancy screening and monitoring applications; health education about the COVID-19 health protocol for pregnant women and management pregnancy through pocketbooks and videos; and referral to health facilities to help the pregnant women. Moreover, assistance activities involve primary health nurses, people in charge of maternal and child health programs, maternal and child health survey workers, and health cadres. This community service activity aimed to improve pregnant women's self-management during the COVID-19 pandemic in the working area of the Padangsari Primary Health Care Services, Semarang City.

2. Methods

Community service activities were conducted for eight weeks consisting of the preparation, implementation, and evaluation stages. The preparatory stage (weeks 1 to 3) consisted of developing a proposal for the activities, preparing the health education media (videos, books, and Smartphone applications), obtaining permission from the health department

and primary health care services, and conducting the preliminary studies. The reliability test results showed that the questionnaire on pregnant women's self-management was reliable with Cronbach's alpha value of 0.639. The validity and reliability tests of the media used demonstrated content validity with scientific expert consultation. The implementation stage (weeks 4 to 6) consisted of: 1) a pregnancy care behavior survey through an online questionnaire; 2) establishing an online class for pregnant women through a WhatsApp group (pregnant women, nurses, health survey workers, and health cadres); 3) socializing education modules/books and videos of prevention and monitoring of pregnancy health during the COVID-19 pandemic through face-to-face and online meetings; and lastly, and 4) socializing the use of Smartphone applications for screening, monitoring, and independent pregnancy care. The resource persons were pregnant women, nurses, health survey workers, and health cadres. The total number of resource persons was 22 people. The evaluation phase and the preparation of follow-up plans were done online from the 7th to the 8th week.

All activities were conducted in June-July 2020 at the Padangsari Primary Health Care Services, Semarang City, in face-to-face and online activities. Face-to-face activities were done in 1 meeting with a duration of 90-120 minutes integrated with the class schedule for pregnant women at the health center. This activity's target population was 22 pregnant women in the working area of Padangsari Primary Health Care Services Semarang City selected by purposive sampling. The instrument used was a questionnaire on maternal behavior during pregnancy care developed by Rahmadina in 2016, modified to a Google form and an independent pregnancy examination questionnaire using a Smartphone application based on the 2016 Maternal Child Health Book by the Indonesian Ministry of Health. The data analysis of the study used an SPSS computer program. Univariate data were presented as means with standard deviation (SD) and tabled to show each variable and respondents' characteristics with minimum-maximum and 95% confidence interval (CI). Bivariate data analysis of the independent variable's effect on the dependent variable used paired and independent t-tests to measure the self-

Table 1. Characteristics of pregnant women based on the age of the last child, age of pregnant women, height, weight before pregnancy, and weight after pregnancy (n = 22)

Variable	Mean	SD	Min -Max	95% CI
Last child age	1.73	2.931	0-9 th	from 0.43 to 3.03
pregnant women age	27.59	5.161	16-38 years	from 25.3 to 29.88
Height of pregnant women	154.73	6.057	145-167 cm	152.04-157.41
Body weight before pregnancy	55	12.66	38-83 Kg	49.39-60.61
Body weight after pregnancy	59.31	14.81	44-88 Kg	52.75-65.88

CI, confidence interval; min-max, minimum-maximum; SD, standard deviation

management of pregnant women. Paired t-test was used to determine the impact of self-management of pregnant women before and after treatment. An unpaired t-test was performed to test for differences between the intervention group and the control group.

3. Result

Based on Table 1, the mean age of the last child was 1.73 years with SD 2.931. The lowest age was 0 years (childless), and the highest age was nine years. The mean age of pregnant women was 27.59 years, with SD of 5.161. The lowest age of pregnant women was 16 years, and the highest was 38 years. The mean of pregnant women's height was 154.73 cm with SD 6.057, with the shortest height was 145 cm, and the highest was 167 cm. Before pregnancy, the mean body weight was 55 kg with SD 12.66. The lowest body weight before pregnancy was 38 kg, and the highest was 83 kg. After pregnancy, the mean body weight was 59.31 kg with SD 14.81 and the lowest body weight after pregnancy was 44 kg, and the highest was 88 kg.

Table 2 shows that half of the pregnant women have blood type A, namely ten participants (45.5%). Half of the pregnant women have a college education background, with as many as nine (40.9%). Half of the pregnant women are housewives, with as many as 11 (50%). Half of the pregnant women do not have income, namely nine (40.9%). Most pregnant women are currently in their first pregnancy (primigravida) with as many as 15 people (68.2%).

Examination of pregnancy during the pandemic COVID-19 consists of breast care, nutrition fulfillment, tetanus toxoid immunization, and prenatal care at a health care facility. Table 3 shows that half of the pregnant women performed breast

care correctly, with 11 participants (50%). Half of the pregnant women fulfilled the nutritional needs well, with as many as 11 (50%). Most pregnant women did tetanus toxoid immunization, with as many as 13 (59.1%). Most pregnant women performed pregnancy examinations well, with as many as 13 (59.1%). Most of the pregnant women did antenatal care well during the COVID-19 pandemic, with as many as 12 participants (54.5%).

4. Discussion

COVID-19 is an infectious disease caused by a new type of coronavirus that was not previously identified in humans, namely *Severe Acute Respiratory Syndrome Coronavirus 2* (SARS-CoV-2). The clinical manifestations that appear in the patients are acute respiratory disorders such as fever, cough, and shortness of breath with a mean incubation period of 5-6 days. Complications that may follow the disease progression include pneumonia, acute respiratory syndrome, kidney failure, and even death. This virus first appeared in Wuhan, Hubei Province, China, in January 2020 and has now spread to almost all countries in the world in a short time, including Indonesia.¹³ Based on this, the WHO declared the problem as a public health emergency affecting the world and considered it a pandemic.¹² Indonesia reported its first case of COVID-19 in March 2020 and has experienced an increasing number of patients every day until 2021.

The Indonesian Ministry of Health reported that by October 2020, there were 295,499 confirmed positive cases and 10,972 deaths. There was an increase of 4,317 actual positive cases and 116 circumstances of death every day.¹⁴ Efforts are needed to prevent and control the spread of COVID-19 infection so that the increase in morbidity

Table 2. Characteristics of pregnant women based on blood type, education, occupation, income, and pregnancy (n = 22)

Variable	f	%
Blood type		
A	10	45.5
AB	3	13.6
B	2	9.1
O	7	31.8
Education		
Graduated elementary school/ equivalent	8	36.4
Graduated High School/ equivalent	5	22.7
Graduated College	9	40.9
Jobs		
Labor	6	27.3
Lecturer / teacher	3	13.6
Housewives	11	50
Merchants	1	4.5
Entrepreneur	1	4.5
Income (monthly)		
No income	9	40.9
< regional minimum wage (Rp. 2,715,000)	9	40.9
≥ regional minimum wage (Rp. 2,715,000)	4	18.2
Pregnancy		
1st	15	68.2
2nd	4	18.2
4th	3	13.6

and mortality can be reduced. Every society is faced with the reality of preparing to live side by side with COVID-19. Therefore, the community as the frontline to prevent and control COVID-19 infection must be able to identify vulnerable and high-risk groups such as the elderly, people with comorbidities, toddlers, and pregnant women.¹⁵

Pregnant women are one of the groups who are more vulnerable to COVID-19 exposure. When pregnant, the mother's immunity decreases, so they can more easily become infected. Furthermore, another concerning reason regarding the mother's health is that there are changes to pregnancy health services and essential nutrition programs for pregnant women during the COVID-19 pandemic, leading to the increase of morbidity and death risk in mothers. Based on the 2015 inter-census population survey, the MMR in Indonesia was 305 per 100,000 live births, meaning two mothers in Indonesia die every hour. With the spread of COVID-19 transmission, the challenges in reducing maternal mortality are even higher. Therefore, it needs more attention and efforts from all parties, including public

awareness and compliance, in realizing this goal. Pregnant women can make some effort to prevent COVID-19 infection.¹⁶

In general, the efforts that pregnant women can do during pregnancy are performing proper hand washing for at least 20 seconds; using an alcohol-based hand sanitizer with an alcohol content of at least 70% if water and soap are not available; avoid touching the eyes, nose, and mouth with hands that have not been washed; avoiding contact with people who are sick as much as possible; wearing a mask; staying at home especially when feeling ill or if sick, immediately go to a suitable health facility; restricting outside activities; disinfecting surfaces or objects that are often touched; consulting a specialist doctor if there are complaints, and continuously looking for accurate information.¹³

Pregnant women as a vulnerable group must understand the management principles of COVID-19 during pregnancy, including early isolation; standard infection prevention procedures; oxygen therapy; avoiding excess fluids; giving empiric antibiotics by considering secondary risks due to bacterial infection; health screening as needed; monitoring fetal and uterine contractions; early mechanical ventilation of progressive respiratory distress; delivery planning based on an individual approach or obstetric indications; and a multidisciplinary team-based approach.¹⁰ Moreover, prenatal care demands in mothers have to be supported by various techniques while still paying attention to strict health protocols. One modification of this approach is the development of teleconsultation.

Teleconsultation in online classes is expected to be an alternative solution so that pregnant women can still conduct pregnancy checks and care without worrying about being exposed to COVID-19. Online pregnancy classes provide online consultation facilities with health workers such as doctors, midwives, and nurses so that pregnant women can consult about screening and pregnancy care during the COVID-19 pandemic. Modification of online pregnancy classes is supported by using an Android-based Smartphone application that contains pregnancy screening forms, electronic-based pregnancy monitoring manuals during the

Table 3. Overview of the implementation of pregnancy care during the COVID-19 pandemic (n = 22)

Variable	f	%
Breast care		
Good	11	50
Poor	11	50
Nutrition fulfillment		
Good	11	50
Poor	11	50
Tetanus toxoid immunization		
Good	13	59.1
Poor	9	40.9
Pregnancy examination		
Good	13	59.1
Less good	9	40.9
General pregnancy examination status		
Good	12	54.5
Less well	10	45.5
Total	22	100

COVID-19 pandemic, and health education videos on health protocols and new habits adaptation for pregnant women.¹²

Online consultation media are now widely used by the public, supported by government policies on the recommendation to stay at home during daily activities and allow calls from a safe distance. Information technology is the mainstay of society to meet the needs for health service access, including maternal and child health services. The previously announced policy to minimize community visits to health care facilities is a supporting factor in using the teleconsultation channel for pregnant women. Besides, the community's ability to access Smartphones and the increasing use of mobile technology are opportunities in developing teleconsultation.¹⁷ Several studies have stated that online pregnancy classes effectively increase the knowledge and skills of mothers in conducting pregnancy examinations and care.¹⁸

Furthermore, it was found that as many as 89.5% of pregnant women who participated in the pregnancy class completed their visit 4. There was a significant effect on the pregnancy class on increasing knowledge and skills.¹¹ This result is also supported by research, which found that there were statistically significant differences in the practice of preventing the high risk of pregnancy between the intervention and control groups.¹² Moreover,

pregnant women who take online pregnancy classes show improvement in practice, communication, cooperation, monitoring of health status, self-care, and a healthy lifestyle. Pregnant women who take antenatal classes have good knowledge about the danger signs of pregnancy.¹⁹ Pregnant women who attended pregnancy classes via text messaging had a higher mean antenatal care score with more than six visits, and increased participation in syphilis and HIV screening.²⁰

Pregnant women who participate in the pregnancy class are 2.2 times more likely to get adequate antenatal care, 2.7 times more likely to use midwives for childbirth, and 2.8 times more likely to give birth in health care facilities compared to other non-health facilities.²¹ Based on the analysis, the pregnancy class provided media to promote the efforts in reducing maternal mortality and high-risk pregnancies. Pregnant women who join the pregnancy class showed increased knowledge, attitudes, and behavior about high-risk pregnancies and tended to complete their pregnancy visits. Knowledge and attitudes about antenatal care increased significantly in pregnant women who followed text message-based pregnancy programs. Furthermore, text messages or Smartphone apps are very efficient in providing the required pregnancy care information to reduce health financing, increase understanding, insight, and information needs during pregnancy care.¹

Based on our study results, it can be concluded that pregnant women who participate in the online pregnancy class can understand the importance of pregnancy examinations and care. Pregnancy class is an approach that can be used to learn about pregnancy health and increase mothers' knowledge and skills about pregnancy examination and maintenance.²² Implementation of pregnancy classes could increase safety during pregnancy and childbirth. Furthermore, online pregnancy classes can minimize access and geographic difficulties and especially provide security for mothers during pregnancy.²¹ This model's implementation needs full support from all family members since they are responsible for monitoring the pregnancy. Online pregnancy classes can increase the coverage of pregnancy visits and can minimize all risks and

pregnancy complications as early as possible.²³

Furthermore, health workers must modify interventions, media, and methods so that access to health services, especially pregnancy, can be reached during the COVID-19 pandemic to ensure that the pregnancy is well monitored. Pregnant women as a vulnerable group must be protected from the risk of exposure to COVID-19 by restricting health care facility visits. However, the condition of pregnancy must also be monitored. Therefore, it is essential for all parties, especially families and communities, to address this problem. It is expected that pregnant women will be able to properly prepare for labor when the pregnancy health is well monitored. Accordingly, there is a need to collaborate with all health workers, pregnant women, and cadres.

5. Conclusion

Based on these activities' results, results show that pregnant women have performed pregnancy examinations and care properly, including breast care, nutritional fulfillment, immunization, and other general pregnancy examinations. The development of online pregnancy classes can be integrated with the pre-existing maternal and child health programs in primary health care facilities. Modification of online pregnancy classes is needed to guarantee the safety and security of pregnant women during the COVID-19 pandemic and to ensure that the risks and complications of pregnancy can be prevented.

Acknowledgements

We express our gratitude for Health Polytechnic of the Ministry of Health Semarang, which provided a grant from DIPA POLTEKKES 2020, Semarang Health Office, and Padangsari Primary Health Care Services.

Conflict of interests

There is no conflict of interest to declare.

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