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Exploring the antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia: A qualitative study

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Abstract

Background: COVID-19 pandemic affects almost all health care services, including antenatal care (ANC). Pregnant woman is one of vulnerable groups during the COVID-19 pandemic and should undertake ANC visits during pregnancy due to the benefits of ANC. The Indonesian government restrictions due to the COVID-19 pandemic influence the delivery of antenatal care services and social support to pregnant women, particularly in rural area. Investigating antenatal care during the pandemic, including challenges, barriers, and facilitators, based on the pregnant women and health care providers' perspectives is important to provide proper care for pregnant women living in rural area. Yet, challenges antenatal care in rural area of Indonesia during the COVID-19 pandemic are not sufficiently explored. This study explored the antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia.

Methods: This was a qualitative study, involved 31 participants consist of pregnant women and health care providers who selected using a purposive sampling method. Data collections were performed between March and August 2021. Data were collected using focus group discussions, in-depth interviews, and field notes, then, analyzed using a content analysis method.

Results: This study revealed five themes to describe antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia, including perceived risks (perceived vulnerability, perceived threat), perceived barriers (internal barriers, external barriers), getting social support (having extended family, sources of support, types of support), adopting health promotion behavior (precautionary actions, nutrition, social activity), and shifting in health care services (service modifications, quality assured, health care protocols, program adjustment).

Conclusion: Performing ANC during COVID-19 pandemic era is challenging, particularly among pregnant women living in rural area. Pregnant women perceived some risks and barriers to do antenatal care visits, however they had good social support and health promotion behavior to prevent the COVID-19 transmission. Health care providers make numerous program adjustment to provide high quality ANC during the COVID-19 pandemic. It is critical to develop a program aimed to facilitate antenatal care and health promotion during pregnancy using a technology to facilitate a non-direct conventional consultation method between health care providers and pregnant women.

Keywords: Antenatal care, COVID-19, Indonesia, Pregnancy, Rural area

Background

The Coronavirus [SARS-CoV-2] pandemic or COVID-19 was declared as an international public health problem (1). The COVID-19 cases spread massively to all regions of the Southeast Asia. The number of total COVID-19 confirmed cases and deaths in Indonesia up to September 3, 2021 were 4,116,890 and 134,930, respectively, which made Indonesia ranked 13 in term of total COVID-19 confirmed cases (2) (3). The COVID-19 pandemic has affected all live aspects in Indonesia, including health services routine, such as antenatal care (ANC). Pregnant woman is one of the vulnerable groups in the COVID-19 pandemic (4) however, pregnant women are encouraged to accomplish ANC during the COVID-19 pandemic due to the ANC benefits. The ANC coverage in Indonesia has decreased in the last two years. The ANC coverage among Indonesian pregnant women in 2018, 2019, 2020 were 88%, 88.5%, and 84.6% respectively (5-7). The decline in ANC coverage in Indonesia in 2020 might be due to the COVID-19 pandemic. Indonesian government launched the first case of COVID-19 in Indonesia on March 2, 2019. The Indonesian Obstetrics and Gynecologists Association announced 20% of MMR in Indonesia during since 2020 up to August 2021 was related to COVID-19 infection (8). A study in Brazil also found that 13.19% of maternal death in 2020 was caused by COVID-19 infection (9).

ANC is an essential activity should be accomplished during pregnancy. The aims of ANC are to assure that every pregnancy ends in the delivery of a healthy infant without undesirable effects on the health of pregnant women throughout health promotion, disease prevention, early detection, and management of complications and existing diseases (10). Pregnant women living in developing countries has less ANC attendance comparing to pregnant women in developed countries, particularly among pregnant women living in rural area which lack of health care providers and health facilities (11) Irregular antenatal care attendance causes potential complications during pregnancy, delivery, and puerperium for both mother and infant, such as preeclampsia, eclampsia, anemia, preterm birth, low birth weight, and stillbirth (12). Pregnancy may cause some diseases development such as pregnancy induced hypertension, diabetes gestational, pre-eclampsia, and eclampsia (13).

Most of the pregnant women mortality due to COVID-19 infection identified as pregnant women with and without comorbid diseases during their pregnancy. Previous stuies confirmed that the effect of COVID-19 infection to pregnant women may causes severe outcome such as abortion (14) increase maternal morbidity and mortality, pre-eclampsia, and preterm birth (15). Another study in India found that the number of deliveries in institutional hospital reduced 45.1%, high risk pregnancy increased 7.2%, admission to intensive care unit

raise 2.5-fold, and one-third of pregnant women had inadequate antenatal visits during the COVID-19 pandemic. The principal reasons for delayed health-seeking behavior were lockdown and fear the COVID-19 infection transmission in health care center, resulting in 44.7% of pregnancies with complication in India (16). Previous study found that access and continuity of prenatal care, particularly to conduct early detection of the COVID-19 symptoms is highly recommended (17) because pregnant women experience a relative immunodeficiency and it makes worsen the clinical COVID 19 infection and lead to bad outcomes in the mothers and fetus (18). Therefore, ANC visit is important to be accomplished to screen pregnancy related health problems which may cause of COVID-19 infection worsening among pregnant women.

Attending ANC during the COVID-19 pandemic is more challenging. A recent study in India found that of 144 pregnant women, two third reported at least one barrier, one third reported fear, and more than three fourth did not accept ultrasounds assessment and blood tests during the COVID-19 pandemic (19). Several barriers to ANC during the COVID-19 pandemic were identified. They were health facilities related barriers, poor quality of care, government regulations against COVID-19, anxiety, risk of infection minimization (20), closing hospital/health care center due to the COVID-19 situation, private health sectors involvement, lack of transportation facilities, fear of getting transmitted COVID-19 from health care providers (21), lack of social support from husband, restrictions of face-to face interaction with health professionals, lack of information on COVID-19, high uncertainty about pregnancy and birth during COVID-19 pandemic (22), psychosocial challenges such as social isolation, lack of information about neonatal care (e.g. breastfeeding with COVID-19 infected women), lack of public transportation, and lack of update information related to COVID-19 particularly among women in low-and middle income countries (23). In addition, pregnant women from low socio-economic class and had pre-existing pregnancy complications were more likely to have barriers attending ANC (19). A little is known regarding the antenatal care challenges during the COVID-19 pandemic in Indonesia, particularly in rural area which facing a lot of barriers to reach antenatal care, from pregnant women and health care provider's perspectives using a qualitative approach. The knowledge provided in this research could be used to develop an appropriate and safe ANC programs for pregnant women living in rural area.

Aim and objectives

This study aimed to explore the challenges of pregnant women and health care providers to accomplish antenatal care during the COVID-19 pandemic

The objectives of this study were:

1. What difficulties experienced by pregnant women to accomplish antenatal care during the COVID-19 pandemic
2. What facilitators experienced by pregnant women viders to accomplish antenatal care during the COVID-19 pandemic
3. How antenatal care services' adaptation during the COVID-19 pandemic

Methods

Study design and setting

A qualitative method with a conventional content analysis approach was used to conduct this study. The qualitative method emphasizes deep understanding, complexity, and details of the phenomena under study, and the researcher is actively involved in the research process. In conventional content analysis, most of the data are obtained through interviews. Interviews with individuals allow us to understand the experiences and perceptions of the participants and obtain richer data from their experiences (24). Qualitative exploratory descriptive design was used in conducting this study. Qualitative exploratory descriptive design was found to be useful in exploring challenges of antenatal care during the COVID-19 pandemic. The design enabled researchers in this study to have in-depth understanding into challenges of antenatal care by pregnant women and health care providers in the rural area of Indonesia. The study was reported using the COREQ criteria for reporting qualitative research (25).

Indonesia is a country with highest population in Southeast Asia. The biggest ethnicity is Javanese which counted around 40% of total population whom the majority live in rural area. Data were collected in Central Java Province which most of the population is Javanese to have an in-depth understanding into challenges of antenatal care during COVID-19 pandemic living in rural area. The study was conducted from April to August 2021. Most pregnant women conducted ANC in Primary Health Center.

Participants

The population in this study are pregnant women and health care providers whom living in rural area. A purposive sampling technique was used in selecting the study participants. The inclusion criteria of pregnant women in this study were trimester two or three, had visited Primary Health Center to conduct ANC, and had at least three ANC attendance. Only pregnant women who had visited the PHC during the data collection period were involved in study. Participants were recruited through the PHC list of pregnant women whom met the inclusion criteria. A short message was sent to pregnant women requesting their participation in study.

Pregnant women who indicated their willingness to participate in this study and met inclusion criteria were invited for data collection. Pregnant women who had high risk pregnancy were excluded from study. The inclusion criteria of health care providers were work in PHC, had at least three years' experience, and provide ANC. The health care providers were selected purposively and sent a formal invitation letter to participate in the study. A total of 31 participants who agreed to participate in the study were invited to conduct FGD and in-depth interview.

Data collection

Data collection was started after receiving the code of ethics from IRB Faculty of Medicine, Universitas Jenderal Soedirman. Data were collected by the researchers who are faculty members in Nursing Department, Faculty of Health Sciences, Universitas Jenderal Soedirman, the majority are Javanese ethnicity, familiar with the principles of qualitative research, and using an interview guideline. The researchers selected prospective participants by considering the diversity of social, economic, and demographic characteristics (such as age, level of education, employment status, and parity) for pregnant women and length of working experiences for health care providers. The greater diversity of the study participants provides for a more in-depth exploration and analysis of the phenomena. To adhere the Declaration of Helsinki for study involving human subject and ethical issues, participants in this study were informed of the study's purpose, procedure, risks, and their voluntary involvement without any consequences if they want to quit from this study anytime. The participants who choose to withdraw from the study will receive ANC in PHC as usual. The researchers also guarantee for their confidentiality and anonymity of their information.

Two FGDs were conducted in this study, consisting of 12 members in first FGD and 9 members in second FGD. The study was conducted from March to August 2021. Only two FGDs were possible as the situation of COVID-19 during July 2021 in Indonesia getting worst so the data collection method was switched into in-depth interview conducted through social media and online interviewing to prevent transmission of COVID-19 via close contact and follow the Indonesia Government regulation about quarantine restrictions in Java Island. Then, the researchers used WhatsApp video call to conduct ten in-depth interviews. The researchers provided an electronic informed consent form before starting the interviews. The researchers send a hard copy of informed consent to participants who find difficulty to fill out the electronic informed consent. The researchers let the participants know that the interviews were recorded and transcribed verbatim.

Information related to demographic characteristics was collected before FGD started. All the discussion and interview were audio recorded for further verbatim transcription. During the FGD, the researchers encourage all the participants to share their knowledge, feeling, and experience to conduct ANC during the COVID-19 pandemic. In addition, a researcher observed and took notes to supplement the audio recorded FGDs. The ANC facility observation data were reported as a narrative data based on the observation results in PHC, and its environment was also written up. The observations data were used to confirm the results from FGDs and in-depth interviews to enrich the data. Only the researchers and participants attended the FGDs session to ensure the participant's information confidentiality and privacy.

FGD was conducted in the Indonesian language using the interview guideline by the researcher whom expert in community health nursing and familiar with FGD process. The researcher who leading the FGD had a doctoral degree in community health with experience in qualitative research. The first FGD was conducted in the meeting room within PHC and the second FGD was conducted in the meeting room of the Sub-District Government Office. An initial introduction between the participants and the researchers was performed before the FGD session. In qualitative study, data saturation reach when the extension of interviews does not deliver new data and all founded codes are recurrent (26). In this study, the saturation was achieved in the 31th participant, then the researchers decided to end the data collection. As a result, there were 31 participants were involved in this study consist of 10 individuals and two focus groups. Each interview and FGD in this study lasted around 60 and 90 min, respectively.

Research instrument

Data were collected throughout a semi-structured interview guideline based on the empirical literature review on ANC in the COVID-19 pandemic situation. A panel of experts, consisted of a maternity nurse and two lecturers from Maternity Nursing Department, was asked to review the interview guideline for its relevance with study purpose. The interview guideline also was verified for its clearness to three pregnant women. The FGDs and in-depth interviews used an open-ended question. Probes were used to elicit further descriptions of challenges and experiences.

Data analysis

Data were analyzed using a thematic content analysis method (27). Data analysis was conducted with qualitative content analysis. In this study, two researchers analyzed the data independently. Firstly, the data were transcribed the next day after collected by the assistance of researchers and analyzed by the second and third author. Data collection and data analysis were conducted simultaneously. Secondly, the transcribed verbatim was carefully read and re-

read by the researchers to be familiar with the data before going interview to the next participant. Thirdly, all the transcribed verbatim were carefully and precisely examined line by line to find initial codes. Data was cleaned by eliminating all distinguishable info. In the fourth stage, the researchers categorized codes which had associated meanings into one group and considered their significance. Finally, all of codes and categories were in the central categories which called sub-themes and themes. All the research team members discussed on the coding, categories, sub-themes, and themes which well organized into charts for agreement. Some participants were requested to read the study results and provided opportunity to give any feedback and to find out if themes showed their views. The research team discussed the final themes emerge in this study. The study report follows the consolidated criteria for reporting qualitative research (COREQ) (25). The demographic characteristics of the participants were presented in frequency, percentage, median, minimum, and maximum.

Trustworthiness

In order to assess the quality of the study data, the researchers used Lincoln and Guba's trustworthiness criteria (26). Most researchers in this study were Javanese, native residents of the region under investigation to acquire the participants' trust and confidence and familiarity. The researchers involved pregnant women and health care providers from various age groups, parity, level of education, working status, and working experiences to identify different views and concepts (credibility). During the research, a qualitative research specialist observed data collection and processing and two qualitative researchers analyze the data independently. The data collection, data analysis, and theory generation process can be audited (dependability). The researchers attempted to avoid subjective prejudices by recording all FGDs and interviews, keeping the field notes, and avoiding interfering the data analysis results (confirmability). Then, the study results were provided to participants and asked to confirm whether the results exactly reflected their experiences (transferability).

Rigour

The interview guideline was developed based on literature review on current ANC during the COVID-19 pandemic. The draft of interview guideline was modified based on the panel of experts and pregnant women's suggestions outside the study participants for its clearness. The researcher had working as maternity nursing for 12 years had interacted with pregnant women to ensure depth understanding of study findings. Participants had opportunity to do member checking to validate data gathered from this study and asked for their opinions regarding the themes. All research team read and discussed the data to confirm the right data were reported.

Three researchers in this study had experience to conduct and publish qualitative study further help to ensure the rigor of qualitative research in this study.

Ethical consideration

Ethical approval for this study was granted by the Institutional Review Board of Medical Faculty, Universitas Jenderal Soedirman No 1204/KEPK/III/2017. Permissions were also required from district assemblies and Ministry of Health where data were collected.

The researchers explained about the research purposes, procedures, risks, participants' expected role, and the voluntary of participation in this study. Participants were also informed that they can decline from this study anytime and would not affect any health care services received by them. Informed consent forms were filled and signed by participants before data collection. A written or electronic informed consent was obtained before involvement in the study and agreement to audio record the discussion or in-depth conversation was taken. All participants' data were documented with codes to guarantee anonymity and only the research team can access the research data to ensure confidentiality.

Results

Participants

The median age of the participants was 32 years (SD) ranging from 19 to 52 years old. In our study, two third of participants were multiparous, half of participants were housewives, and one third of participants graduated from Junior High School (**Table 1**).

Table 1. The participant's demographic data

Variables	Frequency (%)	Median (Min-Max)
Sex		
Male	1 (3.22%)	
Female	30 (96.78%)	
Age (years)		31 (19-52)
<20	1 (3.22%)	
20-35	19 (61.29%)	
> 35	11 (35.49%)	
Parity		
Primiparous	8 (26.67%)	
Multiparous	22 (73.33%)	
Occupation		
Seller	1 (3.22%)	
Teacher	1 (3.22%)	
Housewives	15 (48.36%)	
Private employee	6 (19.33%)	
Government employee	2 (6.44%)	
Health care provider	6 (19.33%)	
Education		
Elementary School	3 (9.67%)	

Junior High School	6 (19.35%)
Senior High School	10 (32.26%)
University	12 (38.72%)

Themes

This study revealed five themes, including perceived risks, perceived barriers, getting support, adopting health promotion behavior, and shifting in health care services. Each theme are described below, with added subthemes and descriptive quotes in each subtheme (**Table 2**). The explanation was complemented by findings from the field notes which acquired from observations at the Primary Health Centers.

Table 2. Summary of themes and sub-themes from the transcribed data

Themes	Sub-themes
1. Perceived risks	Perceived vulnerability
	Perceived threat
2. Perceived barriers	Internal barriers
	External barriers
3. Getting support	Having extended family
	Sources of support
	Types of support
4. Adopting health promotion behavior	Precautionary actions
	Nutrition concern
	Social activities restriction
5. Shifting in health care services	Service modifications
	Quality assured
	Health care protocols
	Program adjustments

1. Perceived risks

This theme is comprised of two subthemes, including perceived vulnerability and perceived threat.

Perceived vulnerability

Almost all of participants stated that the pandemic situation makes them feel anxious because they are a vulnerable group which should be protected either at home or in the working office. Their interactions with other people outside home make them feel insecure. However, participants said that they feel grateful and happy with their pregnancy.

> …I very worried since I am pregnant…my office colleague was confirmed COVID-19 so I feel very anxious…I quickly do an antigen swab…if I am not pregnant I might not be that panicked...(R8, Multiparous, 34 years old)

The participants also mentioned that they feel bit anxious as they may at risk of getting COVID-19. They are worried about their health condition because of immunity decreasing during pregnancy and visiting health care facilities to have ANC or others health problems.

> …I feel fear because I pregnant in the pandemic which my immune system is weak during pregnancy…(R4, Primiparous, 26 years old)
>
> …I am scared because the COVID-19 spread very quickly, I feel fear when I go to the PHC to do ANC or take my child due to fever…(R13, Multiparous, 23 years old)

Another participant expressed that she had mixed feeling to get pregnant during this time. She had a grateful and anxious at the same time because she is waiting for this pregnancy for long time. However, her pregnancy happens at COVID-19 pandemic which make her anxiety to get COVID-19 infection because of her immunity status is decreasing.

> …I'm grateful and happy for my first pregnancy after waiting for a long time…however I also anxious because I get pregnancy during the COVID-19 pandemic…(R16, Multiparous, 34 years old)

Perceived threat

Some participants mentioned that the COVID-19 pandemic make them feel threatened because of the fast and easy virus transmission. They also feel threatened because they see news of the death of pregnant women caused by the COVID-19 virus increasing significantly.

> ...I feel afraid if I infected of the COVID-19 as the virus transmission is vastly and easily, I worry to my health status especially my fetus health in the womb...(R3, Multiparous, 39 years old)
>
> …I feel very scared because the COVID-19 is very dangerous especially for pregnant women…I see in the news, a lot of pregnant women die due to the COVID-19 infection…(R15, Primiparous, 23 years old)

2. Perceived barriers

This theme is comprised of two subthemes, including internal barriers and external barriers.

Internal barriers

Participants explained that the COVID-19 pandemic make several barriers to do their daily activities. The Indonesia government regulation encourage people to stay at home, particularly among the vulnerable groups make participants feel bored and faced difficulties to do some activities outside home. Participants mentioned that they miss pre-COVID-19 pandemic era which they feel free to visit their parents and meet other family members. Having a close relationship among family members are common lifestyle in the rural area of Indonesia.

> …I feel really bored during the COVID-19 pandemic because I have to stay at home all day for very long time…(R23, Multiparous, 36 years old)
>
> …I find difficulty to go outside during the COVID-19 pandemic…this situation makes me feel lazy… I really want to go to my parents' house…(R9, Primiparous, 24 years old)

External barriers

Some participants explained additional challenges during the COVID-19 pandemic. They mentioned that they live with other vulnerable groups such as elderly, children, and comorbid people. This situation makes participants to take care of herself, her parents, or

children extra carefully. Some participants mentioned that their activities while working outside home increase the chance of being infected with COVID-19.

> ...I have to increase infection precaution practices because my parents have comorbidities, so we have to take care each other…moreover, I have some children, their age are 6 years old, 5 years old, and 3 years old...(R6, Multiparous, 42 years old)

Participants whom working outside home stated that they should combining working duties and pregnancy status during the COVID-19 pandemic. Participant struggling to combine between the COVID-19 prevention, pregnancy care, and work duties.

> ...I am a working mother and sometimes I have to do field work, my husband and my mother said you should not do the filed job however, that is my duty so I have to do field job carefully riding motorbike by my self...(R20, Multiparous, 29 years old)

3. Getting support

This theme is comprised of three subthemes, including having extended family, sources of support, and types of support.

Having extended family

Living in extended family is common among Indonesian. Some participants living with their parents whom have comorbid disease. Participants explained that this environment makes them taking care each other and make a mutual support to prevent COVID-19 transmission among them in the family cluster.

> …I live with my father and he is sick, so I have to do infection precautions strictly…I always wash my hands while just arrived home…we take care and support each other...(R11, Primiparous, 22 years old)

Sources of support

Living in the rural area makes participants getting closer with their family members, particularly their husband, parents, and parents in law. Almost all participants received support from their husband, parents, parents in law, and others family members during the COVID-19 pandemic. Participants explained that their supportive people give more attention to them and provide a lot of restrictions during the COVID-19 pandemic to prevent of being infected.

> ...My parents and my husband very worry about my health status, they always ask me where are going…my family always remind me to take care myself and limit my mobility…(R17, Primiparous, 27 years old)

Types of support

Participants mentioned that their husband and other family members always support them continuously. The types of support are emotional, informational, appraisal, and instrumental support. Participants explained that they should limit their social activities and non-essential mobilization, which are not easy for those living in the rural area.

> …my husband also often tells me about the COVID-19 prevention, buy mask and sanitizer, and vitamin to protect me from being infected…he also ask me to stay at home

and do not go to crowds…he became more attentive to me and make me feel comfort at home...(R21, Multiparous, 32 years old)

4. Adopting health promotion behavior

This theme is comprised of three subthemes, including precautionary actions, nutrition concern, and social activities restriction.

Precautionary actions

Participants in this study described that they should make some adaptations during the COVID-19 pandemic. They practice precautionary actions such as stay at home, physical distancing, wearing mask, washing hands, bring hand sanitizer, taking shower, and changing clothes after going outside home.

> ...the point is to just take care of yourself in this pandemic...(R1, Multiparous, 31 years old)
> ...must keep distance, must less travelling...(R9, Primiparous, 24 years old)
> … the preparation at home such as wash your hands with a mask before going to the Puskesmas or to another clinic.... yes, bring it (handsanitizer)... yes, if you go, bring a hand sanitizer with that mask....keep your distance……(R24, Multiparous, 32 years old)
> ...when come back from outside, wash your hands, immediately change everything from bathing and all kinds of things. In the past, we can just get used to it... …(R15 , Primiparous, 23 years old)

Nutrition concern

Participants explained that they took some actions to improve body immune system during pandemic. They got information that COVID-19 virus may be fight by having a good immunity status. Most participants consumed more vegies, fruits, and high protein source food to increase their immune system and had a healthy pregnancy.

> …I need more nutrition because of my pregnancy…I need to consume more vitamin, particularly vitamin C to increase immunity…I always be supported to eat more veggies and fruits...(R18, Multiparous, 36 years old)

Social activity restriction

Almost all of participants explained that they had social activity restrictions during the COVID-19 pandemic. Most people whom living in rural area have several social activities, such as neighbor's meeting, religious meeting, praying together at the mosque, helping neighbors prepare for the wedding, etc. Participants were encouraged to stay at home and do not allow to attend social activities which involve a lot of people in order to prevent the COVID-19 transmission.

> …My husband do not allow me to join social gathering, recitation and *yasinan*…I always attended the event regularly every month before the COVID-19 pandemic…(R6, Multiparous, 42 years old)
> ….since the COVID-19 pandemic, my husband ask me to do not pray together at the mosque because I met a lot of people there….(R17, Primiparous, 27 years old)

5. Shifting in health care services

This theme is comprised of four subthemes, including service modifications, quality assured, health care protocols, and program adjustment.

Service modifications

All of participants mentioned that some health services method had been changed during the COVID-19 pandemic. Participants explained that the health care protocols should be followed when they go to antenatal visits. The antenatal care service also had been modified to reduce the COVID-19 transmission risk between patient and health care provider such as antenatal care duration, distance, referral system, private midwifery clinic, high risk pregnancy, and home visits. Pregnant women received less detailed information regarding their pregnancy assessment results.

> …we usually do several antenatal examination include some physically checks, measures all things as stated in the Indonesia Ministry of Health guidance, however we just measure the blood pressure since the COVID-19 pandemic…we cannot assess pregnant women as detail as before the COVID-19 pandemic and did not explain the pregnant women and her fetus conditions specifically…we only give the most important information to pregnant women such as the fetus position, heartbeat, and estimation weight…I think that are the differences of ANC care between before and after the COVID-19 pandemic… (R29, Multiparous, 47 years old)

Health professionals explained that they spend less time in direct contact with patients during this COVID-19 pandemic. The antenatal assessment focus on patient's health problem and complaint, if there are no pregnancy complaints so they can delay ANC visit to minimize the risk of getting COVID-19. They also give less detailed information related to the fetal growth and development.

> …at the beginning of the COVID-19 pandemic, we often educate pregnant women to stay at home, do not go to health care facilities if there is no health problem and we do home visit... but now we are getting tired too…currently, pregnant women come to the PHC although they have no any health problems related to pregnancy because they want to know their fetus health status…(R27, Multiparous, 32 years old)
>
> …pregnant women come to PHC because they have health problem such as their teeth becoming sick…we do home visit only for high risk pregnant women...(R31, Multiparous, 51 years old)
>
> …we do the pregnancy examination in a short duration and just focus on the important things…(R28, Multiparous, 42 years old)

Participants mentioned that the ANC assessment duration and discussion session were short. They had no chance to express their feeling and ask some questions related to their pregnancy.

> …when I have ultrasound examination, the doctor did not explained the results in detail…he just say that it's good and normal, the doctor didn't give me the opportunity to express my feeling or ask some questions…(R10, Multiparous, 33 years old)

Health professionals mentioned that they suggest the pregnant women to use nearest health service post or midwives private services in their village and reduce inappropriate referral to hospital in order to prevent the COVID-19 transmission.

> ...If there are no health problems, we suggest pregnant women to do ANC in the village midwife practice, so pregnant women who come from far away do not need to conduct ANC in PHC in order to minimize mobilization and contact with a lot of people because just a few pregnant women do ANC at the village midwife... (R27, Multiparous, 32 years old)
> ...we reduce the number of ANC or childbirth referral to hospital…pregnant women advised to perform ANC as scheduled…we also encourage pregnant women to do ANC at the nearest midwife clinic…(R26, Male, 52 years old)

Quality assured

Almost all participants explained that they feel satisfied with care services provided by health professionals during pandemic. Although there were some restrictions during the COVID-19 pandemic, participants stated that the quality of antenatal care service is satisfied. The health care provider also reported that they always provide a good quality antenatal care to pregnant mothers during the COVID-19 pandemic.

> … I satisfied with the quality of ANC service in PHC….(R28, Multiparous, 34 years old)
> … So far, the ANC service is enough for me....(R14, Primiparous, 22 years old)
> …The ANC services for pregnant women during this COVID-19 pandemic still running as usual….(R29, Multiparous, 47 years old)

Health care protocols

All participants said that they must adhere health protocols when going outside home. They always wear mask, washing hands, and physical distancing when doing ANC. Health care providers confirmed that there is a big banner in front of the Primary Health Center to inform patients about health care protocols. They always remind patient to follow health care protocols and they admonishment patients who do not comply with health protocols. All participant stated that they are applying the COVID-19 health protocols (wearing mask, washing hands, physical distancing)

> ….we provide health care services in the PHC using a high standard of the COVID-19 precautions… we always remind patients and their families who come to PHC to wear mask, make a physical distancing at least 2 meters, and wash our hands using water and soap before and after entering the PHC...(R26, Male, 52 years old)

New procedures

All of participants described new procedure on ANC, birth, and postnatal. Health care providers confirmed the perinatal care procedures had been changed to prevent the COVID-19 transmission. Health care providers apply new procedures for pregnancy checking and delivery during pandemic such as early screening, separating healthy and suspected pregnant women, seating/ room arrangement and wearing PPE (personal protective equipment).

> ...we provide ANC service as usual however, we have a strict health protocols such as screening the pregnant women's temperature, assess their symptoms such as having cough, cold, or travelling…the pregnant women can go directly to obstetric examination polyclinic…pregnant women who have symptoms such as coughs and colds will be placed in the isolation room by security guard…(R27, Multiparous, 32 years old)
>
> …there is health screening for pregnant women before entering the PHC, pregnant women can enter the examination room when they pass the screening check list, we help the administrative process, so they do not need meet a lot of people in the waiting room…if pregnant women have some symptoms such as fever, colds, or cough, then we put them into the isolation room…R31, Multiparous, 51 years old)

Health care providers also explained that they are applying new procedures for the delivery process in the PHC. They performed early screening, using isolation room for normal pregnant women with COVID-19, separating the non-COVID-19 women, assisting the confirmed COVID-19 patient delivery process, care coordination with the village midwife, wearing hazmat while assisting the delivery process, and only refer women with pathological pregnancies to hospital.

> …. we have a special isolation room for childbirth, so if a pregnant women comes to PHC, why do some assessment such as travel history, pregnant women who have a travel history directly go to the isolation room…we do not care pregnant women without travel history or cold symptoms together with those who have symptoms….we also wear appropriate PPE to help childbirth of both symptomatic and asymptomatic women...(R27, Multiparous, 32 years old)
>
> …We experienced helped childbirth of confirmed COVID-19 women twice…we use hazmat during the delivery process…we suggest confirmed COVID-19 pregnant women to inform the village midwife when they have true childbirth signs the village midwife will contact the PHC to prepare isolation room and wear hazmat…we help confirmed COVID-19 patient to give birth here as long as they do not have emergency or pathologic condition…(R29, Multiparous, 47 years old)

Health care providers also explained that they are applying new procedures for the post delivery process in the PHC. They use isolation room, separate the baby with mother after birth, limit the visitors, and separate the waiting room for families.

> …We always open the window after finish delivery process…we have experience help some confirmed COVID-19 patients and all health care providers stay healthy until now...(R30, Multiparous, 42 years old)
>
> …. We separate confirmed COVID-19 postpartum mother with her newborn…all newborn from confirmed COVID-19 woman is healthy…we also limit the number of visitors and separate the waiting room for confirmed COVID-19 families...(R28, Multiparous, 42 years old)

Antenatal class program adjustment

Pregnancy class (antenatal health education program) held by Primary Health Care is still running during this pandemic. Half of participants, including those who had comorbid, said that they had pregnancy class during the COVID-19. Some participants mentioned that they do not join the pregnancy class because the limitation number of participants. The health care

providers confirmed that the pregnancy class was modified by limiting the number of participants in each meeting by using policy invited participants only and applying strict health care protocols during the pregnancy class.

> …Pregnancy class is still running until now with a strict health protocols...(R23, Multiparous, 36 years old)
>
> …The pregnancy class conducted once a month and limited to only 10 pregnant women in a village…we only invited high risk pregnant women to take pregnancy class because of the restrictions during the COVID-19 pandemic, we are trying to provide pregnancy class for all pregnant women…(R29, Multiparous,47 years old)
>
> …Only invited pregnant women can attend the class now…all pregnant women may join the pregnancy class before the COVID-19 pandemic….(R28, Multiparous, 42 years old)

Health care providers explained that they modify the implementation of pregnancy training class program during this pandemic. The modifications aimed to prevent the COVID-19 transmission among pregnant women. The program adjustment was limiting the number of participants, applying the COVID-19 health protocols, limiting the number of participants (by invitation), applying the COVID-19 health protocols, limiting the duration of meeting.

> …We still have pregnancy class program in the community…the number of invited pregnant women is limited due to the distance among pregnant women consideration. We also reduce the number of pregnancy class from 12 to 8 meetings due to uncertain COVID-19 transmission….we always apply health protocols during pregnancy class such as wear mask, wash hands, and keep physical distancing…. (R27, Multiparous, 32 years old)
>
> ...Pregnancy class program have been accomplished each months with number of participants limitation…we invite 6 to 10 high risk pregnant women to join the class…we also regulate the pregnancy class duration and apply high standard of the COVID-19 transmission precautions...(R31, Multiparous, 51 years old)

Discussion

Up to the author's knowledge, this is the first Indonesian study that investigated the pregnant mothers and health care providers challenging to conduct ANC during the COVID-19 pandemic. Despite challenges and restrictions during the COVID-19 pandemic, ANC services have had to continue providing a full range of services to the pregnant population. Some services are modified in order to provide not only high quality ANC service but also prevent the COVID-19 transmission (28). In addition, the number of ANC visit decrease during the COVID-19 pandemic particularly among pregnant women in rural area (28). Pregnant women living in rural area significantly correlated with the low utilization of ANC service (29). This might be due to transportation problems, distance from health facilities, financial problems, and lack of awareness about the ANC benefits.

This study finding proved that most pregnant women feel fear and anxious due to the COVID-19 transmission. Pregnant woman is a vulnerable group whom increase the probability

to get worsening when infected the COVID-19 since the change of the maternal immune responses and increasing the sensitivity to respiratory pathogens (18). Most Indonesian pregnant women in this study attended ANC in PHC however, they feel fear of the COVID-19 transmission in the health care center. Similarly, previous studies found that pregnant women during the COVID-19 missed ANC visits and feel fear to give birth in health facilities since afraid themselves or their infants infected in health facilities (30), desired to do pregnancy self-monitor but have no sufficient knowledge, perceived have to strictly isolated at home, and expected pregnancy consultation using telemedicine (31). Fear was the most important factor of maternal care reduction during the COVID-19 pandemic and Israeli women feel threat with the COVID-19 transmission in health care center so they refute to visit the health care center for ANC (32). A large survey finding revealed that greater anxiety experienced by pregnant women particularly related to family visit post-delivery restriction, the possibility of baby being infected, lack of support during delivery, and delivery plan changing (33). Anxiety related to the COVID-19 transmission also experienced by workers in Finland particularly among women and young people (34). Unsurprisingly, the combination of pregnancy and working status increase the anxiety of getting infected among Indonesian working women whom get pregnancy during the COVID-19 pandemic.

Indonesian pregnant women explained that they not only feel bored to stay at home for long time but also fear to spread the virus to others family members who have comorbid diseases since the majority of them live in extended family. Pregnant women in Iran also experienced unpleasant feeling due to several restrictions during the COVID-19 pandemic such as fear, obsession, boredom, nervousness, and despair (35). Having an extended family is common for people living in the rural area of Indonesia. Fear of COVID-19 transmission may be caused low adherence to health care protocols among people live in the rural area. Urban residents experienced that it easier to share knowledge about COVID-19 (36), advised others to do preventive behaviors compare to rural residents (36) in addition rural residents were more likely to have negative attitude of doing preventive behaviors, and had lower levels of information evaluation abilities (37). The low adherence of COVID-19 preventive behaviors among people in rural area might be due to low health literacy and lack of COVID-19 preventive information from social media. One study did find that people who had adequate knowledge about COVID-19 were more likely to perform appropriate preventive behavior and urban residents were more likely to practice good preventive behavior compared to rural residents. In addition, people use of social media as a source of COVID-19 information were more likely to have proper preventive behavior (38). In contrast, a study among older adults in

Thailand showed that rural residents had better knowledge and preventive behaviors compare to urban residents, they got the COVID-19 related information from the village health volunteers (39). It might due to the capability of village health volunteers to use a clear and simple way to deliver the COVID-19 related information using the local community wisdom.

Our findings also illustrated that pregnant women received support from their significant others during the COVID-19 pandemic. The Indonesian government has made regulations to limit non-essential mobilization and activities that have the potential to cause crowds in order to prevent the spread of COVID-19 (40). Having close relationship between extended family members is a characteristic of people living in a rural area. They help, take care, and support each other. During the COVID-19 pandemic, pregnant women have a social contact limitation, they got social support from their husband and other family members. Social support from family members, friends, and significant others contributed to protect and develop resilience among pregnant women, affect perinatal mental health, and obstetric outcomes (41). Having a lot of social activities is part of daily life of people living in the rural area of Indonesia. They commonly go to their neighborhood's home, prayer together in the mosque, coming to funeral, attending recitation, wedding ceremony, or social gathering. Pregnant women also reported that social supports were obstructed due to the restrictions during the pandemic, resulting in feeling isolated in their societies (42).

For health promotion behavior, participants in this study mentioned that they made some lifestyle changing during the COVID-19 pandemic due to fear to be infected. Good preventive practice of COVID-19 among pregnant women was found to be were significantly associated with fear of becoming infected and having good knowledge about the COVID-19 preventive behavior (43). Pregnant women are a vulnerable group due to hormone levels fluctuation which involved immune response, so they must rigorously implement prevention from the COVID-19 infection practices such as wearing masks, handwashing using water and soap, physical distancing. In addition, a healthy, adequate, and high quality of food intake which contain sufficient energy, protein, calcium, iron, folic acid, choline, omega-3 fatty acids, and vitamin D are needed (44). Micronutrients deficiencies and poor micronutrients intake may infer immune system and increase complications among pregnant women infected COVID-19. The essential micronutrients for immunocompetency were vitamin A, C, D, E, iron (Fe), selenium (Se), and zinc (Zn) which play an important role to increase immune function and pregnancy outcomes since micronutrients as an immune booster to prevent pregnancy complications among COVID-19 infected women (45).

Related to the ANC program modifications during the COVID-19 pandemic, our participants highlighted that the health care providers deliver essential services, high risk pregnancy early detection, emergency services, and prevention the COVID-10 transmission among health care providers. The Ministry of Health launched the perinatal and newborn health service guideline to guide the health care providers in deliver their health care services, such as general precautions principals, health facilities readiness, perinatal care recommendations, and health services for maternal and newborn in new normal era (28). Health care providers in this study explained that they should re-arrange of ANC programs, limit prenatal examination duration, doing home visits, limit the number of prenatal class participants. The purpose of ANC program adjustments is to save both health care providers and pregnant women from the COVID-19 transmission particularly during the July 2021 when the COVID-19 daily cases in Indonesia reach the highest level of new cases and total cases (3). Consistent with a study in Kenya which reported that health care providers made some ANC program modifications such as decrease the ANC visitation to hospital and increase networking between community health workers and communities (46). The qualitative findings of this study further illustrate that the COVID-19 precautions protocols, ANC adjustments, and pregnancy class modifications in PHC were satisfied, however fast pregnancy examination and reduction of time to discuss the pregnancy examination results should be take into consideration. Unsurprisingly, the maternal health services situation is more difficult for developing countries because lack of sufficient infrastructure and resources, health system collapse, workforce lessening, access decline, and number of ANC visits lessening in order to prevent pregnant women being infection COVID-19 (29). Pregnant women who stated dissatisfaction with maternity care services mostly associated with restrictions during the COVID-19 pandemic caused ANC visitation and pregnancy classes were cancelled, suspended or delivered through telemedicine (47).

Strengths and limitations

A strength of this study is using open-ended questions providing a rich data for qualitative analysis. This study is still relevance with current situation to improve maternal health service in the pandemic era. The principal limitations of this study were limited generalizability of the study findings, as all of our participants were Javanese ethnicity, married women, and attending ANC during the pandemic. These biases may reflect the level of pregnant women awareness to perform ANC during the pandemic. Further research would be required to examine barriers experienced by pregnant women who do not attend ANC during the pandemic and their perinatal outcomes.

Conclusions

This study highlights a substantial impact of COVID-19 pandemic on antenatal care services in rural area of Indonesia. It provides additional evidence that contributes to the growing body of research outlining the challenging antenatal care in the rural area during the COVID-19 pandemic. Our findings indicate providing update information about impact of COVID-19 on pregnant and postpartum women, social support from family members, continuous health care providers support should be taken into consideration in the maternity services in response to the pandemic. Limited interactions with healthcare care providers should be recognized as in the next perinatal program using a social media platform to meet both pregnant women needs and prevent the COVID-19 transmission.

Declaration

-Ethical approval and consent: All methods were carried out in accordance with relevant guidelines and regulations. All procedures were approved by the Institutional Review Board Faculty of Medicine, Universitas Jenderal Soedirman. Informed consent was obtained from all subjects and/or their legal guardian(s)

-Consent to publish: Not applicable

-Availability of data and material: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

-Conflict of interest: There is no conflict of interest to declare

-Funding: This research is supported by the research grant from Universitas Jenderal Soedirman.

-Acknowledgment: We would like to thank The Universitas Jenderal Soedirman for funding this research.

-Author's contribution: MDA conceptualized and designed the study, wrote, and revised the final manuscript. RS analyzed the data and critically reviewed and revised the manuscript. ET designed the study, analyzed the data, and critically reviewed and revised the manuscript. AI contributed to collected data and assisted with data analysis, critically reviewed, and revised the manuscript. DN analyzed the data, and critically reviewed and revised the manuscript. AF contributed to collected data, critically reviewed, and revised the manuscript.

-Author's information: MDA is a Doctor in Nursing Science with research interest of maternity care and women health. RS is a Master in Nursing Science with research interest of Primary Health Care service, community and family health. ET is a Master in Nursing Science with research interest of community and family health. AI is a Master in Nursing Science with research interest of community health nursing care. DN is a Doctor in Nursing Science with

research interest of maternal and childcare. AF is a Doctor in Chemistry with research interest of bioanalysis for medical applications.

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Re: Urgent reminder to provide amendments on : Exploring the antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia: A qualitative study

2 messages

Mrunal Kale <bmcpregnancyandchildbirth@biomedcentral.com> Tue, Aug 9, 2022 at 4:18 PM
Reply-To: Mrunal Kale <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Prof. Anggraeni,

I recently contacted you with a request to make amendments on your submission. To keep our editorial system working efficiently, we have to remove inactive submissions on a regular basis. Therefore, if you haven't made the amendments within the next few days, your submission will be removed.

Naturally, I'm keen to avoid this happening, so if you have any questions or need further clarification, please do contact me straight away.

You can access your paper via the following link:

https://submission.nature.com/submission/f5f5d90e-87a4-4b23-8619-5bf7e163bb2a

Please make any amendments required before selecting the "Submit manuscript" button on the "Review" page.

If you have already contacted our editorial office and been granted an extension, please ignore this email as your submission will not be withdrawn.

Kind regards,

Mrunal Kale
Editorial Support at BMC

> On Wed, 3 Aug at 12:56 PM , BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com> wrote:
> Dear Prof. Anggraeni,
>
> Re: "Exploring the antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia: A qualitative study "
>
> Our Initial Quality Check of your submission has now taken place. As a result, we need

you to address the following points before your manuscript can progress any further:

1. Kindly provide all below sub-section under the heading of **"Declaration".**
   Declaration

   -Ethical approval and consent:
   -Consent to publish:
   -Availability of data and material:
   -Conflict of interest:
   -Funding:
   -Acknowledgment:
   -Author's contribution:
   -Author's information:

   Please indicate as NA or Not applicable under the respective section if above-mentioned points are not applicable for your study.
2. We strongly encourage all authors to share their raw data, either by providing it in a supplementary file or depositing it in a public repository and providing the details on how to access it in this section. If you do not wish to share your data, please clearly state this in this section along with a justification. **"Availability of Data and Materials"** statements can take one of the following forms (or a combination of more than one if required for multiple datasets):

   • The datasets generated and/or analysed during the current study are available in the [NAME] repository, [PERSISTENT WEB LINK TO DATASETS]
   • The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.
   • All data generated or analysed during this study are included in this published article [and its supplementary information files].
   • The datasets generated and/or analysed during the current study are not publicly available due [REASON WHY DATA ARE NOT PUBLIC] but are available from the corresponding author on reasonable request.
   • The data that support the findings of this study are available from [third party name] but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however available from the authors upon reasonable request and with permission of [third party name].

   Please note that if you do wish to share your raw data and do not have consent from all patients to publish this data, it will need to be de-identified.
3. Authors reporting experiments on humans must confirm that all experiments were performed in accordance with relevant guidelines and regulations. Additionally, the manuscript file must include a statement identifying the institutional and/or licensing committee approving the experiments, including any relevant details, in the **ethical approval and consent** section. Please check that the information provided is unambiguous using the following requirements:

   - A statement to confirm that all methods were carried out in accordance with relevant guidelines and regulations.
   - A statement to confirm that all experimental protocols were approved by a

named institutional and/or licensing committee.
- Must include a sentence confirming that informed consent was obtained from all subjects and/or their legal guardian(s).

For further information please see our guidelines using the following link: https://www.biomedcentral.com/getpublished/editorial-policies#ethics+and+consent

If you are unable to confirm ethical approval or consent, or feel that it is not relevant to your study, please contact us to discuss.

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Your paper has been placed back in the menu of the submitting author. To access it, please use the following link, making sure you log in with the same email address you registered with:

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Please make the requested amendments carefully, before selecting the "Submit manuscript" button on the "Review" page. Do not change anything else in your manuscript.

Meanwhile, if you have any questions, please feel free to contact me.

Sincerely,
Mrunal Kale
Editorial Support at BMC

Mrunal Kale <bmcpregnancyandchildbirth@biomedcentral.com> Fri, Aug 12, 2022 at 10:19 AM
Reply-To: Mrunal Kale <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Prof. Anggraeni,

Thank you for the confirmation. We shall get back to you if any changes are to made.

Till then, if you have any queries or concern, please feel free to contact us back.

Have a good day!

Kind regards,
Mrunal Kale
Editorial Support at BMC

On Wed, 10 Aug at 1:33 PM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:

[External - Use Caution]

Dear Mrunal Kale,

I have revise the manuscript and re submit to the online system, with the revision queries are as follows:

1. Kindly provide all below sub-section under the heading of **"Declaration".**
   Declaration

   -Ethical approval and consent:
   -Consent to publish:
   -Availability of data and material:
   -Conflict of interest:
   -Funding:
   -Acknowledgment:
   -Author's contribution:
   -Author's information:

   Please indicate as NA or Not applicable under the respective section if above-mentioned points are not applicable for your study.

   Sub-section of **Declaration** has been added

2. We strongly encourage all authors to share their raw data, either by providing it in a supplementary file or depositing it in a public repository and providing the details on how to access it in this section. If you do not wish to share your data, please clearly state this in this section along with a justification. **"Availability of Data and Materials"** statements can take one of the following forms (or a combination of more than one if required for multiple datasets):

   • The datasets generated and/or analysed during the current study are available in the [NAME] repository, [PERSISTENT WEB LINK TO DATASETS]
   • The datasets used and/or analysed during the current study available from the corresponding author on reasonable request.
   • All data generated or analysed during this study are included in this published article [and its supplementary information files].
   • The datasets generated and/or analysed during the current study are not publicly available due [REASON WHY DATA ARE NOT PUBLIC] but are available from the corresponding author on reasonable request.
   • The data that support the findings of this study are available from [third party name] but restrictions apply to the availability of these data, which were used under license for the current study, and so are not publicly available. Data are however

available from the authors upon reasonable request and with permission of [third party name].

Please note that if you do wish to share your raw data and do not have consent from all patients to publish this data, it will need to be de-identified.

The data availability has been mention in the manuscript, below the **Declaration** sub-section

3. Authors reporting experiments on humans must confirm that all experiments were performed in accordance with relevant guidelines and regulations. Additionally, the manuscript file must include a statement identifying the institutional and/or licensing committee approving the experiments, including any relevant details, in the **ethical approval and consent** section. Please check that the information provided is unambiguous using the following requirements:

   - A statement to confirm that all methods were carried out in accordance with relevant guidelines and regulations.
   - A statement to confirm that all experimental protocols were approved by a named institutional and/or licensing committee.
   - Must include a sentence confirming that informed consent was obtained from all subjects and/or their legal guardian(s).

   For further information please see our guidelines using the following link:
   https://www.biomedcentral.com/getpublished/editorial-policies#ethics+and+consent

   If you are unable to confirm ethical approval or consent, or feel that it is not relevant to your study, please contact us to discuss.

   The ethical approval and consent has been mention in the manuscript, below the **Declaration** sub-section

4. For manuscripts that include information or images that could lead to identification of a study participant, informed consent must have been obtained to publish the information/image(s) in an online open-access publication. If the following is not applicable to your study, please include the heading ***"Consent to publish"*** and write ***"Not Applicable"*** for the section.

   The Consent to publish has been mention in the manuscript, below the **Declaration** sub-section

5. We notice that **table 1, 2, 3** has not been referenced in the main text of your manuscript file. If tables are not cited in the manuscript they will not appear in the html (online) version if your paper is accepted for publication. Therefore, it is essential they are mentioned at least once in the text and, we strongly recommend, in the order in which they are numbered.

   Tables 2 and 3 have been changed to table 1 and 2, and both of them have been referenced in the main text of the manuscript.

6. We notice that **table 1** has not been included with your submission. Please either include this table in your manuscript file in an editable Word or TeX/LaTex format along with its legend or update the references to this table in the main text of your manuscript accordingly.

   There is no table 1 in the previous manuscript, therefore, I have change the table 2 and 3 to table 1 and 2.

Regards,
Dr. Mekar Dwi Anggraeni

BMC Pregnancy and Childbirth: Decision on your manuscript

13 messages

BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com> Fri, Dec 9, 2022 at 6:42 PM
To: mekar.anggraeni@unsoed.ac.id

Ref: Submission ID 90026e5c-f55e-441c-927b-f3a7ae8d074a

Dear Dr Anggraeni,

Re: "Exploring the antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia: A qualitative study"

We are pleased to let you know that your manuscript has now passed through the review stage and is ready for revision. Many manuscripts require a round of revisions, so this is a normal but important stage of the editorial process.

Editor comments
A Major revision is needed. Some of the key areas include:
1. English language editing is required
2. Include the filled COREQ checklist or any other checklist to ensure all necessary aspects are attended to (https://www.equator-network.org/reporting-guidelines/coreq/)
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5. the analysis should also be described clearer; and referenced; a content analysis method is eluded to but never described appropriately; later on you switch to thematic content analysis (Braun and Clarke); there is little evidence that you used this:

The objectives of the study include are (rephrased for clarity):
1. To explore the barriers to receiving antenatal care during the COVID-19 pandemic among women in rural Indonesia
2. To explore the facilitators of receiving antenatal care during the COVID-19 pandemic among women in rural Indonesia
3. To explore coping strategies and adaptations to barriers to receiving antenatal care during the COVID-19 pandemic

However; the results are totally disconnected. I can hardly get an answer to any of the objectives above. Below I paste portions from the results section

1. Perceived vulnerability
Almost all of the participants stated that the pandemic situation makes them feel anxious because they are a vulnerable group that should be protected either at home or in the working office.
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Some participants mentioned that the COVID-19 pandemic makes them feel threatened because of the fast and easy virus transmission.
3. Internal barriers
Participants explained that the COVID-19 pandemic makes several barriers to doing their daily activities. The Indonesian government regulation encourages people to stay at home, particularly among the vulnerable groups makes participants feel bored and faced difficulties to do some activities outside the home.
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Some participants explained additional challenges during the COVID-19 pandemic. They mentioned that they live with other vulnerable groups such as the elderly, children, and comorbid people.
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Living in extended family is common among Indonesian. Some participants living with their parents whom have comorbid disease. Participants explained that this environment makes them taking care each other and make a mutual support to prevent COVID-19 transmission among them in the family cluster.

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Living in the rural area makes participants getting closer with their family members, particularly their husband, parents, and parents in law.
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Participants in this study described that they should make some adaptations during the COVID-19 pandemic.
8. Nutrition concern
Participants explained that they took some actions to improve body immune system during pandemic. They got information that COVID-19 virus may be fight by having a good immunity status.
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All of participants mentioned that some health services method had been changed during the COVID-19 pandemic
10. Quality assured
Almost all participants explained that they feel satisfied with care services provided by health professionals during pandemic
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All participants said that they must adhere health protocols when going outside home. They always wear mask, washing hands, and physical distancing when doing ANC. Health care providers confirmed that there is a big banner in front of the Primary Health Center to inform patients about health care protocols
12. New procedures
All of participants described new procedure on ANC, birth, and postnatal. Health care providers confirmed the perinatal care procedures had been changed to prevent the COVID-19 transmission
13. Antenatal class program adjustment
Pregnancy class (antenatal health education program) held by Primary Health Care is still running during this pandemic.

Above are the first statements from the headings in the results section; reading further; I struggle to see a connection between these statements and the objectives of the study. At the very minimum; the results section should be categorized into 3 broad objectives; facilitators, barriers and coping mechanisms. Thereafter; results should speak to this section. As is; the data need to be reanalyzed. And if these findings are not there; probably conducting more interviews could be of help.

To ensure the Editor and Reviewers will be able to recommend that your revised manuscript is accepted, please pay careful attention to each of the comments that have been pasted underneath this email. This way we can avoid future rounds of clarifications and revisions, moving swiftly to a decision.

Once you have addressed each comment and completed each step listed below, the revised submission and final file can be uploaded via the link below.

If you completed the initial submission, please log in using the same email address. If you did not complete the initial submission, please discuss with the submitting author, who will be able to access the link and resubmit.

https://submission.springernature.com/submit-revision/90026e5c-f55e-441c-927b-f3a7ae8d074a

You can visit https://researcher.nature.com/your-submissions to track progress of this or any other submissions you might have.

CHECKLIST FOR SUBMITTING YOUR REVISION

1. Please upload a point-by-point response to the comments, including a description of any additional experiments that were carried out and a detailed rebuttal of any criticisms or requested revisions that you disagreed with. This must be uploaded as a 'Point-by-point response to reviewers' file.

Please note that we operate a transparent peer review process, where we publish reviewers' reports with the article, together with any responses that you make to reviewers or the handling Editor.

2. Please highlight all the amends on your manuscript or indicate them by using tracked changes.

3. Check the format for revised manuscripts in our submission guidelines, making sure you pay particular attention to the figure resolution requirements:

https://bmcpregnancychildbirth.biomedcentral.com/submission-guidelines

Finally, if you have been asked to improve the language or presentation of your manuscript and would like the assistance of paid editing services, we can recommend our affiliates, Nature Research Editing Service:

https://authorservices.springernature.com/language-editing/ and American Journal Experts: https://www.aje.com/go/springernature

Please note that use of an editing service is neither a requirement nor a guarantee of publication. Free assistance is available from our resources page: https://www.springernature.com/gp/researchers/campaigns/english-language-forauthors

To support the continuity of the peer review process, we recommend returning your manuscript to us within 14 days. If you think you will need additional time, please let us know and we will aim to respond within 48 hours.

Kind regards,

David Mukunya
Editorial Board Member
BMC Pregnancy and Childbirth

Reviewer Comments:

Reviewer 1
Thanks a lot for giving me an opportunity to review this article on antenatal care challenges during the COVID-19 pandemic. The paper contains information which could help structure optimal antenatal care provision and utilization during pandemics. Below, are my comments:
Abstract:
1. “Yet, challenges antenatal care in rural area of Indonesia during the COVID-19 pandemic are not sufficiently explored” this sentence needs to be corrected to make meaning, either challenges of antenatal care or antenatal care challenges
2. Under methods, specify the number of FGDs and IDIs conducted
Introduction:
3. English editing required
Methods:
Study design and setting
4. “Most pregnant women conducted ANC in Primary Health Center” I think pregnant women didn’t conduct maybe attended or went for ANC
Participants
5. “The inclusion criteria of pregnant women in this study were trimester two or three, had visited Primary Health Center to conduct ANC, and had at least three ANC attendance” same here attend not conduct
6. Of the 31 participants, indicate how many were pregnant mothers and those that were health care providers
Data collection
7. Were the members for the FGDs only pregnant mothers? Or FGDs included both pregnant mothers and health care providers? Clearly indicate who were the participants for the FGDs and their numbers as per the two groups if both were included.
8. Similarly for the 10 IDIs, who were the participants? Only health care providers? or both pregnant mothers and health care providers?
Data analysis
9. Please indicate the software used for analysis
Results
10. Table 1: I would suggest categorizations for the two groups separately, the pregnant women and the health care providers. E.g of the …pregnant women, … are multiparous, … are housewives and …finished elementary school. Then of the…health care providers, ….completed tertiary level, …are midwives …are nurses or doctors
11. I also suggest that codes from health care providers be denoted differently for example (R29, Midwife/health care provider, 33 years)
Discussion
12. “Up to the author’s knowledge, this is” since you are more than one author, I suggest writing to our knowledge
13. “prevention the COVID-10 transmission among health care providers” change COVID-10 to COVID-19
14. English editing is required

Reviewer 2
Exploring the antenatal care challenges during the COVID-19 pandemic in rural areas of Indonesia: A qualitative study
Antenatal care challenges during the COVID-19 pandemic in a rural setting are a good area of concern for investigation so that access to antenatal care is improved for improved perinatal health.
The manuscript is very comprehensive, however, some areas need to be improved as indicated below:

The authors need to number the lines/sentences and indicate the pages so that it becomes easy to read through and make references.
The general English and sentence construction need to be improved. For instance, you report the study using the past tense. I encourage you to check on the grammatical errors and sentence construction in the whole document. The document would benefit from the review and editing of an English expert.

Abstract
Introduction
Statement starting with “yet” ….ending with “explored” can be removed and transferred to the background section
Method
How many pregnant women and health care providers participated? What qualitative design guided the study?
Results
Antenatal challenges included; perceived risks and perceived barriers
What about social support, health promotional behaviours and shifting in health care services? What objective or research question was it addressing? Can you link it to the study objective?
Conclusion
Both statements in the conclusion are not clear. The recommendation needs to be improved, state something feasible.

Background
In the second paragraph, the first sentence is too long, try to shorten it
Improve the last sentence in the second paragraph
In the third paragraph; 1st sentence is not clear
Aim and Objectives:
Objective 1: improve the grammar
Objective 2: it is not clear
Objective 3: frame it well
Improve the framing of the objectives such as. To determine. or to explore, to describe, to
If you want to use research questions then state them appropriately.
Generally, the objective doesn’t sound clear. What is the sole aim of this study?
Was it to explore the challenges pregnant women and healthcare providers faced in accessing and providing antenatal care during the COVID-19 period? If so, kindly frame the objective well and use it to guide the writing.
Three specific objectives or research questions are quite many for a manuscript.
Methods
Study design and setting
In the first paragraph: Conventional content analysis—is it a design or a method for data analysis? If it is for analysis, take it to the analysis section

Qualitative exploratory design—is this the design that guided the study? Bring it at the beginning of the paragraph.
Reduce this paragraph by removing what does not belong here
You may need to provide more information about the setting so that someone outside Indonesia can understand the setting of the study.

Participants
Try to shorten the sentences to make them clear and simple. E.g.
The inclusion criteria could be “Pregnant women in trimester 2 or 3 with at least 3 ANC visits, and had visited the PHC for antenatal care were included in the study”

Data collection
First paragraph First sentence, improve the sentence. For instance, you got approval from the IRB before data collection
Who participated in the FGD and interviews?
Fourth paragraph—what language was used for in-depth interviews?

Research instrument
You are talking about open-ended questions and a semi-structured interview guide. which is which? What was used?

Data analysis
Which of these two methods was used in the analysis? Content analysis?? Or thematic content???

Rigour
Was the interview guide pretested, was there any translation at any stage of the data collection and analysis

Results

The themes, sub-themes and quotes are many.
This section needs improvement in the tense, grammar and general sentence construction for easy reading and understanding.
Some themes include: “adopting health promotional behaviour” and “getting support”. How do they relate to the study objective on antenatal care challenges?
You may also want to reduce on the number of quotes if they are too many and crowd space.

Perceived barriers
What are these barriers? How do the barriers relate to the study objective?

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Fri, Dec 9, 2022 at 7:22 PM
To: Amin Fatoni <aminfatoni@gmail.com>

[Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Mon, Dec 12, 2022 at 2:47 PM
To: BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com>

Dear David Mukunya,

Thanks for your information about suggestions for manuscript revision from both the editor and reviewers.
I will try my best in order to submit the revised manuscript within 14 days,
however, the native English proofreader sometimes takes more time due to the long queue.
I will let you know when I need additional time in order to satisfactorily fulfill all of the suggestions.

Best regards,
Mekar Dwi Anggraeni
[Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Tue, Dec 13, 2022 at 10:37 AM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Thank you for your response.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Mon, 12 Dec at 7:48 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> [Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Tue, Dec 20, 2022 at 10:37 AM
To: endangtriyanto@yahoo.com, Rahmi Setiyani <rahmi.setiyani@gmail.com>

Ysh. Pak Endang dan Bu Rahmi,

Mohon saya dibantu untuk melakukan final check artikel publikasi yang sudah saya coba revisi sesuai saran dari editor dan reviewer.
Mungkin ada saran yang terlewat belum diperbaiki atau perbaikan belum sesuai saran dari reviewer/editor.
Saya lampirkan email dari editor.
Terima kasih sebelumnya.

Salam,
MDA

---------- Forwarded message ---------
From: **BMC Pregnancy and Childbirth** <bmcpregnancyandchildbirth@biomedcentral.com>
Date: Fri, Dec 9, 2022 at 6:42 PM
Subject: BMC Pregnancy and Childbirth: Decision on your manuscript
To: <mekar.anggraeni@unsoed.ac.id>

[Quoted text hidden]

4 attachments

BMC_ANC during Covid-19 Pandemic_Revised.docx
91K

Response to editor and reviewer .docx
150K

COREQ_checklist_Mekar.pdf
473K

BMC_ANC during Covid-19 Pandemic-original artikel.docx
81K

Endang Triyanto <endangtriyanto@yahoo.com> Wed, Dec 21, 2022 at 5:22 AM
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>

Maaf baru balas Bu...
Pada halaman 4 di sub bab Setting, masih ada kalimat berbahasa indonesia (bukan kutipan).
Kalo baca daftar revisi, sepertinya sudah lengkap Bu

[Quoted text hidden]

Rahmi Setiyani <rahmi.setiyani@gmail.com> Wed, Dec 21, 2022 at 8:18 AM
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>
Cc: endangtriyanto@yahoo.com

Dear all,

1. Sepertinya all covered siy. Mudah2an link antara objectives dan findings bisa diterima.
2. Untuk COREQ_checklist sepertinya harus diindikasikan di section mana item tersebut dituliskan (tidak hanya sekedar tanda centang), merujuk ke kalimat ini Please indicate in which section each item has been reported in your manuscript.
3. Personal characteristics-relationship established dan participant knowledge of the interview: sepertinya belum ada informasinya di text. Tapi mungkin saya terlewat membaca.
4. Data collection-Repeat interviews: sepertinya belum ada informasinya di text. Tapi mungkin saya terlewat membaca.

Trims
RS
[Quoted text hidden]

BMC_ANC during Covid-19 Pandemic_Revised_Rahmi.docx
99K

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Fri, Dec 23, 2022 at 8:12 PM
To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Tanay Rao,
Editor of BMC Pregnancy and Childbirth,

I would like to ask for revision time extension to January 5, 2023 due to Christmast and New Year Holiday.
The manuscript is under proofread by a British proofreader.

Thanks for your attention.

Best regards,
Mekar Dwi Anggraeni

[Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Mon, Dec 26, 2022 at 7:29 AM
To: BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Dr. David Mukunya,
Editor of BMC Pregnancy and Childbirth,

I would like to ask for revision time extension to January 5, 2023 due to Christmast and New Year Holiday.
The manuscript is under proofread by a British proofreader.
I have sent this request to Dr. Tanay Rao three days ago.

Thanks for your attention.

On Fri, Dec 9, 2022 at 6:42 PM BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com> wrote:
[Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Mon, Dec 26, 2022 at 10:13 AM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Dear Dr Anggraeni,

Thank you for your email. This will not be a problem – we do appreciate that some revisions do take longer than others and we would be more than happy to accommodate an extension for you. Please submit your revised manuscript by 5-Jan-2023

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Fri, 23 Dec at 1:13 PM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> Dear Tanay Rao,
> Editor of BMC Pregnancy and Childbirth,
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Best regards,
Mekar Dwi Anggraeni

On Tue, 13 Dec 2022 at 10.37 Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> wrote:

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> > Dear David Mukunya,
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> > [Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Mon, Dec 26, 2022 at 3:34 PM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Thank you for your email. This will not be a problem – we do appreciate that some revisions do take longer than others and we would be more than happy to accommodate an extension for you. Please submit your revised manuscript by 5-Jan-2023.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Mon, 26 Dec at 12:30 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> [Quoted text hidden]

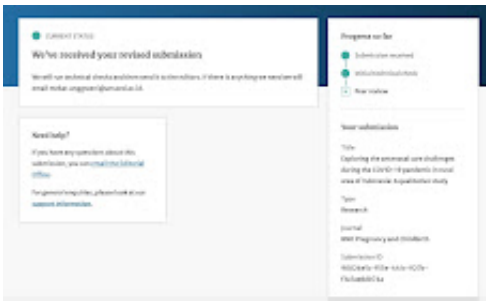
Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Fri, Jan 6, 2023 at 7:05 AM
To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Dr. Tanay Rao,
Editor of BMC Pregnancy and Childbirth,

I have submitted the revised manuscript, response to editor and reviewer's suggestions, and filled the COREQ checklist yesterday.
Please let me know if there is anything else I need to provide.
.
Thanks for your attention.

Best regards,
Mekar

[Quoted text hidden]



BMC submitted.jpeg
77K

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Fri, Jan 6, 2023 at 11:20 AM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Thank you for your response.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Fri, 6 Jan at 12:06 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
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> Mekar
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> > On Mon, Dec 26, 2022 at 3:35 PM Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> wrote:
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[External - Use Caution]

[Quoted text hidden]

BMC Pregnancy and Childbirth: Decision on your manuscript

13 messages

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Ref: Submission ID 90026e5c-f55e-441c-927b-f3a7ae8d074a

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13. Antenatal class program adjustment
Pregnancy class (antenatal health education program) held by Primary Health Care is still running during this pandemic.

Above are the first statements from the headings in the results section; reading further; I struggle to see a connection between these statements and the objectives of the study. At the very minimum; the results section should be categorized into 3 broad objectives; facilitators, barriers and coping mechanisms. Thereafter; results should speak to this section. As is; the data need to be reanalyzed. And if these findings are not there; probably conducting more interviews could be of help.

To ensure the Editor and Reviewers will be able to recommend that your revised manuscript is accepted, please pay careful attention to each of the comments that have been pasted underneath this email. This way we can avoid future rounds of clarifications and revisions, moving swiftly to a decision.

Once you have addressed each comment and completed each step listed below, the revised submission and final file can be uploaded via the link below.

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CHECKLIST FOR SUBMITTING YOUR REVISION

1. Please upload a point-by-point response to the comments, including a description of any additional experiments that were carried out and a detailed rebuttal of any criticisms or requested revisions that you disagreed with. This must be uploaded as a 'Point-by-point response to reviewers' file.

Please note that we operate a transparent peer review process, where we publish reviewers' reports with the article, together with any responses that you make to reviewers or the handling Editor.

2. Please highlight all the amends on your manuscript or indicate them by using tracked changes.

3. Check the format for revised manuscripts in our submission guidelines, making sure you pay particular attention to the figure resolution requirements:

https://bmcpregnancychildbirth.biomedcentral.com/submission-guidelines

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Please note that use of an editing service is neither a requirement nor a guarantee of publication. Free assistance is available from our resources page: https://www.springernature.com/gp/researchers/campaigns/english-language-forauthors

To support the continuity of the peer review process, we recommend returning your manuscript to us within 14 days. If you think you will need additional time, please let us know and we will aim to respond within 48 hours.

Kind regards,

David Mukunya
Editorial Board Member
BMC Pregnancy and Childbirth

Reviewer Comments:

Reviewer 1
Thanks a lot for giving me an opportunity to review this article on antenatal care challenges during the COVID-19 pandemic. The paper contains information which could help structure optimal antenatal care provision and utilization during pandemics. Below, are my comments:
Abstract:
1. “Yet, challenges antenatal care in rural area of Indonesia during the COVID-19 pandemic are not sufficiently explored” this sentence needs to be corrected to make meaning, either challenges of antenatal care or antenatal care challenges
2. Under methods, specify the number of FGDs and IDIs conducted
Introduction:
3. English editing required
Methods:
Study design and setting
4. “Most pregnant women conducted ANC in Primary Health Center” I think pregnant women didn’t conduct maybe attended or went for ANC
Participants
5. “The inclusion criteria of pregnant women in this study were trimester two or three, had visited Primary Health Center to conduct ANC, and had at least three ANC attendance” same here attend not conduct
6. Of the 31 participants, indicate how many were pregnant mothers and those that were health care providers
Data collection
7. Were the members for the FGDs only pregnant mothers? Or FGDs included both pregnant mothers and health care providers? Clearly indicate who were the participants for the FGDs and their numbers as per the two groups if both were included.
8. Similarly for the 10 IDIs, who were the participants? Only health care providers? or both pregnant mothers and health care providers?
Data analysis
9. Please indicate the software used for analysis
Results
10. Table 1: I would suggest categorizations for the two groups separately, the pregnant women and the health care providers. E.g of the …pregnant women, … are multiparous, … are housewives and …finished elementary school. Then of the…health care providers, ….completed tertiary level, …are midwives …are nurses or doctors
11. I also suggest that codes from health care providers be denoted differently for example (R29, Midwife/health care provider, 33 years)
Discussion
12. “Up to the author’s knowledge, this is” since you are more than one author, I suggest writing to our knowledge
13. “prevention the COVID-10 transmission among health care providers” change COVID-10 to COVID-19
14. English editing is required

Reviewer 2
Exploring the antenatal care challenges during the COVID-19 pandemic in rural areas of Indonesia: A qualitative study
Antenatal care challenges during the COVID-19 pandemic in a rural setting are a good area of concern for investigation so that access to antenatal care is improved for improved perinatal health.
The manuscript is very comprehensive, however, some areas need to be improved as indicated below:

The authors need to number the lines/sentences and indicate the pages so that it becomes easy to read through and make references.
The general English and sentence construction need to be improved. For instance, you report the study using the past tense. I encourage you to check on the grammatical errors and sentence construction in the whole document. The document would benefit from the review and editing of an English expert.

Abstract
Introduction
Statement starting with “yet” ….ending with “explored” can be removed and transferred to the background section
Method
How many pregnant women and health care providers participated? What qualitative design guided the study?
Results
Antenatal challenges included; perceived risks and perceived barriers
What about social support, health promotional behaviours and shifting in health care services? What objective or research question was it addressing? Can you link it to the study objective?
Conclusion
Both statements in the conclusion are not clear. The recommendation needs to be improved, state something feasible.

Background
In the second paragraph, the first sentence is too long, try to shorten it
Improve the last sentence in the second paragraph
In the third paragraph; 1st sentence is not clear
Aim and Objectives:
Objective 1: improve the grammar
Objective 2: it is not clear
Objective 3: frame it well
Improve the framing of the objectives such as. To determine. or to explore, to describe, to
If you want to use research questions then state them appropriately.
Generally, the objective doesn’t sound clear. What is the sole aim of this study?
Was it to explore the challenges pregnant women and healthcare providers faced in accessing and providing antenatal care during the COVID-19 period? If so, kindly frame the objective well and use it to guide the writing.
Three specific objectives or research questions are quite many for a manuscript.
Methods
Study design and setting
In the first paragraph: Conventional content analysis—is it a design or a method for data analysis? If it is for analysis, take it to the analysis section

Qualitative exploratory design—is this the design that guided the study? Bring it at the beginning of the paragraph.
Reduce this paragraph by removing what does not belong here
You may need to provide more information about the setting so that someone outside Indonesia can understand the setting of the study.

Participants
Try to shorten the sentences to make them clear and simple. E.g.
The inclusion criteria could be “Pregnant women in trimester 2 or 3 with at least 3 ANC visits, and had visited the PHC for antenatal care were included in the study”

Data collection
First paragraph First sentence, improve the sentence. For instance, you got approval from the IRB before data collection
Who participated in the FGD and interviews?
Fourth paragraph—what language was used for in-depth interviews?

Research instrument
You are talking about open-ended questions and a semi-structured interview guide. which is which? What was used?

Data analysis
Which of these two methods was used in the analysis? Content analysis?? Or thematic content???

Rigour
Was the interview guide pretested, was there any translation at any stage of the data collection and analysis

Results

The themes, sub-themes and quotes are many.
This section needs improvement in the tense, grammar and general sentence construction for easy reading and understanding.
Some themes include: “adopting health promotional behaviour” and “getting support”. How do they relate to the study objective on antenatal care challenges?
You may also want to reduce on the number of quotes if they are too many and crowd space.

Perceived barriers
What are these barriers? How do the barriers relate to the study objective?

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Fri, Dec 9, 2022 at 7:22 PM
To: Amin Fatoni <aminfatoni@gmail.com>

[Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Mon, Dec 12, 2022 at 2:47 PM
To: BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com>

Dear David Mukunya,

Thanks for your information about suggestions for manuscript revision from both the editor and reviewers.
I will try my best in order to submit the revised manuscript within 14 days,
however, the native English proofreader sometimes takes more time due to the long queue.
I will let you know when I need additional time in order to satisfactorily fulfill all of the suggestions.

Best regards,
Mekar Dwi Anggraeni
[Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Tue, Dec 13, 2022 at 10:37 AM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Thank you for your response.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Mon, 12 Dec at 7:48 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> [Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Tue, Dec 20, 2022 at 10:37 AM
To: endangtriyanto@yahoo.com, Rahmi Setiyani <rahmi.setiyani@gmail.com>

Ysh. Pak Endang dan Bu Rahmi,

Mohon saya dibantu untuk melakukan final check artikel publikasi yang sudah saya coba revisi sesuai saran dari editor dan reviewer.
Mungkin ada saran yang terlewat belum diperbaiki atau perbaikan belum sesuai saran dari reviewer/editor.
Saya lampirkan email dari editor.
Terima kasih sebelumnya.

Exploring the Antenatal Care Challenges during the COVID-19 Pandemic in Rural Area of Indonesia from Pregnant Women and Health Care Provider's Perspectives: A Qualitative Study

Mekar Dwi Anggraeni[1], Rahmi Setiyani[1], Endang Triyanto[1], Asep Iskandar[1], Desiyani Nani[1], Amin Fatoni[2]

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[2]Chemistry Department, Faculty of Sciences, Universitas Jenderal Soedirman
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Abstract

Background: COVID-19 pandemic affects almost all health care services, including antenatal care (ANC). Pregnant woman is one of vulnerable groups during the COVID-19 pandemic and should undertake ANC visits during pregnancy due to the benefits of ANC. The Indonesian government policy due to the COVID-19 pandemic influence the delivery of ANC services, particularly in rural area. Investigating antenatal care challenges during the pandemic based on the pregnant women and health care providers' perspectives is important to provide appropriate ANC for pregnant women. This study aimed to explore the ANC challenges during the COVID-19 pandemic in rural area of Indonesia from pregnant women and health care provider's perspectives.

Methods: This was a qualitative exploratory descriptive study, involved 31 participants consist of 25 pregnant women and 6 health care providers who selected using a purposive sampling method. Three Delays Model by Thadeus and Maine's was used as the theoretical framework. Data collections were performed between March and August 2021. Data were collected using two focus group discussions, ten in-depth interviews, and field notes, then, analyzed using a thematic analysis method.

Results: This study revealed three themes to describe ANC challenges during the COVID-19 pandemic in rural area of Indonesia, including phase 1: fear to be infected COVID-19 (feel anxious, perceived vulnerability, protect self and loved ones), phase 2: stay at home policy (transportation barriers to health care, social activity restriction), and phase 3: re-designing ANC service (ANC adjustments, focus on high risk pregnancy, insufficient information, COVID-19 preventive behaviors adherence).

Conclusion: The current study identified some challenges to attend ANC during COVID-19 pandemic in the rural area of Indonesia. There is a need to formulate and implement ANC packages based on these findings to facilitate the consultation and health education needed by pregnant women.

Keywords: Antenatal care, COVID-19, Indonesia, Pregnancy, Rural area

Background

The Coronavirus [SARS-CoV-2] pandemic or COVID-19 was declared as an international public health problem (WHO 2020). The COVID-19 cases spread massively to all regions of the Southeast Asia. The number of total COVID-19 confirmed cases and deaths in Indonesia up to September 3, 2021 were 4,116,890 and 134,930, respectively, which made Indonesia ranked 13 in term of total COVID-19 confirmed cases (2) (3). The COVID-19 pandemic has affected all live aspects in Indonesia, including health services routine, such as antenatal care (ANC). Pregnant woman is one of the vulnerable groups in the COVID-19 pandemic (4) however, pregnant women are encouraged to accomplish ANC during the COVID-19 pandemic due to the ANC benefits. The ANC coverage in Indonesia has decreased in the last two years. The ANC coverage among Indonesian pregnant women in 2018, 2019, 2020 were 88%, 88.5%, and 84.6% respectively (5-7). The decline in ANC coverage in Indonesia in 2020 might be due to the COVID-19 pandemic. Indonesian government launched the first case of COVID-19 in Indonesia on March 2, 2019. The Indonesian Obstetrics and Gynecologists Association announced 20% of MMR in Indonesia during since 2020 up to August 2021 was related to COVID-19 infection (8). A study in Brazil also found that 13.19% of maternal death in 2020 was caused by COVID-19 infection (9).

ANC is an essential activity should be accomplished during pregnancy. The aims of ANC are to assure that every pregnancy ends in the delivery of a healthy infant without undesirable effects on the health of pregnant women throughout health promotion, disease prevention, early detection, and management of complications and existing diseases (10). Pregnant women living in developing countries has less ANC attendance comparing to pregnant women in developed countries, particularly among pregnant women living in rural area which lack of health care providers and health facilities (11) Irregular antenatal care attendance causes potential complications during pregnancy, delivery, and puerperium for both mother and infant, such as preeclampsia, eclampsia, anemia, preterm birth, low birth weight, and stillbirth (12). Pregnancy status may trigger some diseases such as pregnancy induced hypertension, diabetes gestational, pre-eclampsia, and eclampsia (13).

Most of the maternal death due to COVID-19 infection were identified as pregnant women with comorbid diseases. Previous studies confirmed that the effect of COVID-19 infection to pregnant women may causes severe outcome such as abortion (14), increase maternal morbidity and mortality, pre-eclampsia, and preterm birth (15). Another study in India found that the number of deliveries in institutional hospital reduced 45.1%, high risk pregnancy increased 7.2%, admission to intensive care unit raise 2.5-fold, and one-third of pregnant

women had inadequate antenatal visits during the COVID-19 pandemic. The principal reasons for delayed health-seeking behavior were lockdown and fear the COVID-19 infection transmission in health care center, resulting in 44.7% of pregnancies with complication in India (16). Previous study found that access and continuity of prenatal care, particularly to conduct early detection of the COVID-19 symptoms is highly recommended (17) because pregnant women experience a relative immunodeficiency and it makes worsen the clinical COVID 19 infection and lead to bad outcomes in the mothers and fetus (18). Therefore, ANC visit is important to be accomplished to screen pregnancy related health problems which may cause of COVID-19 infection worsening among pregnant women.

Attending ANC during the COVID-19 pandemic is more challenging. A recent study in India found that of 144 pregnant women, two third reported at least one barrier, one third reported fear, and more than three fourth did not accept ultrasounds assessment and blood tests during the COVID-19 pandemic (19). Several barriers to ANC during the COVID-19 pandemic were identified. They were health facilities related barriers, poor quality of care, government regulations against COVID-19, anxiety, risk of infection minimization (20), closing hospital/health care center due to the COVID-19 situation, private health sectors involvement, lack of transportation facilities, fear of getting transmitted COVID-19 from health care providers (Singh et al. 2021), lack of social support from husband, restrictions of face-to face interaction with health professionals, lack of information on COVID-19, high uncertainty about pregnancy and birth during COVID-19 pandemic (Meaney et al. 2022), psychosocial challenges such as social isolation, lack of information about neonatal care (e.g. breastfeeding with COVID-19 infected women), lack of public transportation, and lack of update information related to COVID-19 particularly among women in low-and middle income countries (McDonald et al. 2020). In addition, pregnant women from low socio-economic class and had pre-existing pregnancy complications were more likely to have barriers attending ANC (19). A little is known regarding the antenatal care challenges during the COVID-19 pandemic in Indonesia, particularly in rural area which facing a lot of barriers to reach antenatal care, from pregnant women and health care provider's perspectives using a qualitative approach. Yet, antenatal care challenges during the COVID-19 pandemic in rural area of Indonesia from pregnant women perspectives are not sufficiently explored. The knowledge provided in this research could be used to develop an appropriate and safe ANC programs for pregnant women living in rural area.

Methods

Aim

This study aimed to explore the antenatal care challenges during the COVID-19 pandemic from pregnant women and health care provider's perspectives.

Study design

A qualitative exploratory descriptive design was used in conducting this study. Qualitative exploratory descriptive design was found to be useful in finding answer about who, what, and where of experiences and obtaining insights from participants about an inadequately understood phenomenon (Polit DF, Beck CT. Essentials of Nursing Research: Appraising Evidence for Nursing Practice. 8. Philadelphia, PA: Wolters Kluwer Health; Lippincott Willians & Wilkins; 2014. Supplement for Chapter 14: Qualitative Descriptive Studies. Retrieved from http://downloads.lww.com/wolterskluwer_vitalstream_com/sample-content/9781451176797_Polit/samples/CS_Chapter_14.pdf., Heyjin Kim, Justine S. Sefcik, Cristine Bradway, 2017). This design appropriate to explore challenges of antenatal care during the COVID-19 pandemic in which still not well understood yet in Indonesia. The qualitative method emphasizes deep understanding, complexity, and details of the phenomena under study, and the researcher is actively involved in the research process. This study used Three Delays Model developed by Thaddeus and Maine as the study framework (S Thaddeus, D Maine, 1994). https://pubmed.ncbi.nlm.nih.gov/8042057/

Setting

Indonesia is a country with highest population in Southeast Asia. Indonesia is one of the highest MMR in South East Asia (UNICEF, 2015).https://data.unicef.org/country/idn/ The number of MMR in Indonesia is 305 per 100,000 live births (Central Statistical Bureau, 2015). ProfilPenduduk Indonesia HasilSUPAS. Jakarta: BadanPusatStastistik; 2015. Indonesia divided into 38 provinces and had more than 300 ethnic groups. The biggest ethnicity in Indonesia is Javanese which counted around 41% of total population whom the majority of population live in the rural area (Ministry of Communication and Informatics, 2022). https://www.google.com/search?q=kominfo&rlz=1C5CHFA_enID887ID887&oq=komin&aqs=chrome.1.69i57j0i433i512j0i20i263i512j0i512l2j46i175i199i512j0i512l4.4064j0j15&sourceid=chrome&ie=UTF-8 The number of MMR in Central Java Province is positioned in the third biggest rank in Indonesia. Data were collected in Banyumas District which is the big six number of MMR in Central Java Province. There are 17 hospitals and 30 Primary Health Center (PHC) in Banyumas District however, the ANC coverage in Banyumas District is very low,

included in the lowest 10 ANC coverage in Central Java Province, lower than the national ANC coverage (Central Java Province Ministry of Health, 2021). https://dinkesjatengprov.go.id/v2018/dokumen/Profil_Kesehatan_2021/mobile/index.html

The majority of the population living in the rural area. So, this study conducted in order to have an in-depth understanding into challenges of antenatal care during COVID-19 pandemic living in rural area. The study was conducted from April to August 2021. Most pregnant women attend ANC in Primary Health Center because Indonesia Ministry of Health policy regulate low risk pregnancy attend ANC in the PHC and high risk pregnancy may be referred into secondary and tertiary hospital based on the pregnancy related health problem's severity.

Participants

The population in this study are pregnant women and health care providers whom living in rural area. A purposive sampling technique was used in selecting the study participants. The inclusion criteria were pregnant women in trimester two or three, had at least three ANC attendance, and had visited the PHC for ANC were included in the study. Participants were recruited through the PHC list of pregnant women whom met the inclusion criteria. Pregnant women who indicated their willingness to participate in this study and met inclusion criteria were invited for data collection. Pregnant women who had high risk pregnancy were excluded from study. The inclusion criteria of health care providers were work in PHC, had at least three years' experience, and provide ANC. The health care providers were selected purposively and sent a formal invitation letter to participate in the study. A total of 31 participants, involve 25 pregnant women and 6 health care providers, who agreed to participate in the study were invited to attend FGD and in-depth interview.

Data collection

Data collection was started after receiving the code of ethics from IRB Faculty of Medicine, Universitas Jenderal Soedirman. The researchers got the approval from the IRB before data collection. Data were collected by the researchers who are faculty members in Nursing Department, Faculty of Health Sciences, Universitas Jenderal Soedirman, the majority are Javanese ethnicity, familiar with the principles of qualitative research, and using an interview guideline. The researchers selected prospective participants by considering the diversity of social, economic, and demographic characteristics (such as age, level of education, employment status, and parity) for pregnant women and length of working experiences for health care providers. The greater diversity of the study participants provides for a more in-depth exploration and analysis of the phenomena. To adhere the Declaration of Helsinki for study involving human subject and ethical issues, participants in this study were informed of

the study's purpose, procedure, risks, and their voluntary involvement without any consequences if they want to quit from this study anytime. The participants who choose to withdraw from the study will receive ANC in PHC as usual. The researchers also guarantee for their confidentiality and anonymity of their information.

Two FGDs were conducted in this study, consisting of twelve pregnant mothers in first FGD and nine pregnant mothers in second FGD. The study was conducted from March to August 2021. Only two FGDs were possible as the situation of COVID-19 during July 2021 in Indonesia getting worst so the data collection method was switched into in-depth interview conducted through social media and online interviewing to prevent transmission of COVID-19 via close contact and follow the Indonesia Government policy about large scale social restriction in Java Island. Then, the researchers used WhatsApp video call to conduct ten in-depth interviews (six health care providers and four pregnant mothers). The researchers meet the proposed participants in the PHC for the first time, introducing self, discussing about the study, and contact share. Then, the researchers contact the proposed participant using social media (WhatsApp) and asking for their willingness to participate in this study. The researchers provided an electronic informed consent form before starting the interviews. The researchers send a hard copy of informed consent to participants who find difficulty to fill out the electronic informed consent. The researchers let the participants know that the interviews were recorded and transcribed verbatim.

Information related to demographic characteristics was collected before FGD started. FGD was conducted in the Indonesian language using the interview guideline by the researcher whom expert in community health nursing and familiar with FGD process. The researcher who leading the FGD had a doctoral degree in community health with experience in qualitative research. The first FGD was conducted in the meeting room within PHC and the second FGD was conducted in the meeting room of the Sub-District Government Office. An initial introduction between the participants and the researchers was performed before the FGD session. The researchers introduced themselves as faculty members in Universitas Jenderal Soedirman so, participants feel free to talk with the researchers.

All the discussion and interview were audio recorded for further verbatim transcription. During the FGD, the researchers encourage all the participants to share their knowledge, feeling, and experience to attend ANC during the COVID-19 pandemic. In addition, a researcher observed and took notes to supplement the audio recorded FGDs. The ANC facility observation data were reported as a narrative data based on the observation results in PHC, and its environment was also written up. The observations data were used to confirm the results

from FGDs and in-depth interviews to enrich the data. Only the researchers and participants attended the FGDs session to ensure the participant's information confidentiality and privacy. There was no others people during the FGD session.

In qualitative study, data saturation reach when the extension of interviews does not deliver new data and all founded codes are recurrent (23). In this study, the saturation was achieved in the 31th participant, then the researchers decided to end the data collection. As a result, there were 31 participants were involved in this study consist of 10 individuals and two focus groups. Each interview and FGD in this study lasted around 60 and 90 min, respectively. There is no repeat interview in this study and two prospective participants declined to participate in this study because they had a busy schedule.

Research instrument

Data were collected throughout a semi-structured interview guideline based on the empirical literature review on ANC in the COVID-19 pandemic situation. A panel of experts, consisted of a maternity nurse and two lecturers from Maternity Nursing Department, was asked to review the interview guideline for its relevance with study purpose. The interview guideline also was verified and pilot tested for its clearness to five pregnant women whom did not involve as the study participants. The FGDs and in-depth interviews used a semi-structured question. Probes were used to elicit further descriptions of challenges and experiences.

Data analysis

Data were analyzed using a thematic analysis method (24). The data were analyzed by two researchers independently started by familiarization with the data, producing initial codes, searching for themes, evaluating themes, defining and naming themes, and making the study report. In this study, two researchers analyzed the data independently using NVivo 12.0 Software. Firstly, the data were transcribed the next day after collected and analyzed by the second and third author to be familiar with the data. Data collection and data analysis were conducted simultaneously. The transcribed verbatim was carefully read and re-read by the researchers. The researchers provided opportunity to participants to check the verbatim. Secondly, all the transcribed verbatim were carefully and precisely examined line by line to find initial codes and categorized based on the meaning similarity. Data was cleaned by eliminating all distinguishable info. The researchers gave initial codes before going interview to the next participant. Thirdly, the researchers develop sub-themes and themes based on the categorized data. The researchers categorized codes which had associated meanings into one group called sub-themes and considered their significance. Fourthly, all of codes and categories were in the central categories which called themes. All researchers evaluate the draft of themes

in a regular biweekly meeting. Fifthly, all the research team members discussed on the coding, categories, sub-themes, and themes which well organized into charts for agreement. Furthermore, all research team discuss about themes sub-theme's definition and appropriate name. Some participants were requested to read the study results and provided opportunity to give any feedback and to find out if themes showed their views. Then, the research team discussed the final themes name emerge in this study before make a final report. Sixthly, the research team made a study final report. The study report follows the consolidated criteria for reporting qualitative research (COREQ) (22). The demographic characteristics of the participants were presented in frequency, percentage, median, minimum, and maximum.

Trustworthiness

In order to assess the quality of the study data, the researchers used Lincoln and Guba's trustworthiness criteria (23). Most researchers in this study were Javanese, native residents of the region under investigation to acquire the participants' trust and confidence and familiarity. The researchers involved pregnant women and health care providers from various age groups, parity, level of education, working status, and working experiences to identify different views and concepts (credibility). During the research, a qualitative research specialist observed data collection and processing and two qualitative researchers analyze the data independently. The data collection, data analysis, and theory generation process can be audited (dependability). The researchers attempted to avoid subjective prejudices by recording all FGDs and interviews, keeping the field notes, and avoiding interfering the data analysis results (confirmability). Then, the study results were provided to participants and asked to confirm whether the results exactly reflected their experiences (transferability).

Rigour

The interview guideline was developed based on literature review on current ANC during the COVID-19 pandemic. The draft of interview guideline was modified based on the panel of experts and pregnant women's suggestions outside the study participants for its clearness. Then, the draft of interview guideline was tested into five pregnant women and two health care providers. The researcher had working as maternity nursing for 12 years had interacted with pregnant women to ensure depth understanding of study findings. The data were translated into English in each stage of data analysis process. Participants had opportunity to do member checking to validate data gathered from this study and asked for their opinions regarding the themes. All research team read and discussed the data to confirm the right data were reported. Three researchers in this study had experience to conduct and publish qualitative study further help to ensure the rigor of qualitative research in this study.

Ethical consideration

Ethical approval for this study was granted by the Institutional Review Board of Medical Faculty, Universitas Jenderal Soedirman No 1204/KEPK/III/2017. Permissions were also required from district assemblies and Ministry of Health where data were collected. The researchers explained about the research purposes, procedures, risks, participants' expected role, and the voluntary of participation in this study. Participants were also informed that they can decline from this study anytime and would not affect any health care services received by them. Informed consent forms were filled and signed by participants before data collection. A written or electronic informed consent was obtained before involvement in the study and agreement to audio record the discussion or in-depth conversation was taken. All participants' data were documented with codes to guarantee anonymity and only the research team can access the research data to ensure confidentiality.

Results

The majority of pregnant women were age between 20-35 years old (52%), multiparous (68%), housewives (68%), and graduated Senior High School (40%). Then, the health care providers consist of three midwives (50%), a nurse (16.7%), a head of PHC (16.7%), and a doctor (16.7%). The mean age of the health care providers was 41.83 years, with a range from 34-52 years. The majority of health care providers had working experience more than 11 years (66.7%). Half of health care providers completed bachelor degree and diploma of midwifery, respectively (Table 1).

Table 1. The participant's demographic data

Variables	Frequency (%)	Median (Min-Max)
Pregnant women		
Age (years)		31.5 (19-43)
<20	1 (4%)	
20-35	13 (52%)	
> 35	11 (44%)	
Parity		
Primiparous	8 (32%)	
Multiparous	17 (68%)	
Occupation		
Seller	1 (4%)	
Teacher	1 (4%)	
Housewives	15 (60%)	
Private employee	6 (24%)	
Government employee	2 (8%)	
Education		
Elementary School	3 (12%)	
Junior High School	6 (24%)	
Senior High School	10 (40%)	

University	6 (24%)	
Health care providers		
Gender		
Male	1 (16.7%)	
Female	5 (83.3%)	
Age (years)		41 (34-52)
20-35	1 (16.7%)	
> 35	5 (83.3%)	
Working experience		
5-10 years	2 (33.3%)	
>11 years	4 (66.7%)	
Education		
Bachelor of Public Health	1 (16.7%)	
Medical Doctor	1 (16.7%)	
Diploma of Midwifery	3 (50%)	
Bachelor of Nursing	1 (16.7%)	
Occupation		
Head of PHC	1 (16.7%)	
Medical Doctor	1 (16.7%)	
Midwives	3 (50%)	
Nurse	1 (16.7%)	

Themes

The explanation was complemented by findings from the field notes which acquired from observations at the Primary Health Centers. This study revealed three themes guided by the Three Delays Model by Thadeus and Maine as the study framework. The themes were phase 1: fear to be infected COVID-19, phase 2: stay at home policy, and phase 3: re-designing ANC services. Each themes with added sub-themes and descriptive quotes in each sub-theme are described below (Table 2).

Table 2. Summary of themes and sub-themes from the transcribed data

Themes	Sub-themes
1. Phase 1: fear to be infected COVID-19	Feel anxious
	Perceived vulnerability
	Protect self and loved ones
2. Phase 2: stay at home policy	Transportation barriers to health care
	Social activity restriction
3. Phase 3: re-designing ANC services	ANC adjustments
	Focus on high risk pregnancy
	Insufficient information
	COVID-19 preventive behaviors adherence

1. Phase 1: fear to be infected COVID-19

This theme is comprised of three sub-themes, including feel anxious, perceived vulnerability, and protect self and loved ones.

Feel anxious

Almost all of participants stated that the pandemic situation makes them feel anxious. Their interactions with other people outside home make them anxious to be infected COVID-19.

> …I very worried since I am pregnant…my office colleague was confirmed COVID-19 so I feel very anxious to contact with other people, including health care provider...(P8, Multiparous, 39 years old)

The participants also mentioned that they feel anxious as they may at risk of getting COVID-19. They worried about their health condition because of their weak immunity status and increasing risk to be infected COVID-19 while visiting health care facilities to attend ANC.

> …I am scared because the immunity status of pregnant women is decrease and the COVID-19 virus spread very quickly, I really feel fear when I go to the PHC to attend ANC so, I prefer to delay my next ANC schedule…(P23, Multiparous, 29 years old)

Perceived vulnerability

Another participant expressed that she had mixed feeling to get pregnant during this time. She had a grateful and anxious at the same time because she is waiting for this pregnancy for long time. However, her pregnancy happens at COVID-19 pandemic which placed her as a venerable person to get COVID-19 infection and this situation hindered her to attend ANC.

> …I'm grateful and happy for my first pregnancy after waiting for a long time…however this situation placed me as a vulnerable person because I get pregnancy during the COVID-19 pandemic so I do not attend ANC regularly…hopefully I can contact health care providers using social media (P3, Primiparous, 36 years old)

Protect self and loved ones

Some participants explained that they live with other vulnerable groups such as elderly, children, and comorbid people at home. Some participants mentioned that their outside home activities increase the opportunity to be infected, so they try to minimize visiting high risk COVID-19 transmitted place including attend ANC. Some participants prefer to delay attending ANC in order to prevent both themselves and their children/parents from infected COVID-19.

> ...I have to minimize visiting high risk transmitted place because I have some children and my parents have comorbidities, so we have to take care each other…I will delay my ANC schedule after the COVID-19 situation getting better...(P8, Multiparous, 39 years old)

2. Phase 2: stay at home policy

This theme is comprised of two sub-themes, including transportation barriers to health care and social activities restriction.

Transportation barriers to health care

Participants explained that the COVID-19 pandemic make several barriers to do their daily activities. The Indonesia government policy encourage people to stay at home during COVID-19 pandemic. Participants mentioned that they faced public transportation barriers to attend ANC during COVID-19 pandemic due to Indonesia government policy to prevent people's mobility.

> …I faced difficulty to attend ANC during the COVID-19 pandemic because lack of public transportation due to the Government policy to stay at home and it constraint the public transportation availability…it really helpful if I can make a consultation with health care providers using a social media...(P14, Multiparous, 30 years old)

Social activity restriction

Almost all of participants explained that they had social activity restriction during the COVID-19 pandemic in order to follow the Indonesian Government policy about large scale social restriction. Participants mentioned that they were encouraged to stay at home and do not attend activities which involve a lot of people in order to prevent the COVID-19 transmission.

> …My husband does not allow me to join social gathering, recitation and religious meeting during the COVID-19 pandemic…I have to follow the Indonesian Government regulation to stay at home and it make me decide to delay attending ANC this month…(P6, Multiparous, 28 years old)

3. Phase 3: re-designing ANC services

This theme is comprised of three sub-themes, including ANC adjustments, focus on high risk pregnancy, insufficient information, and COVID-19 preventive behavior's adherence.

ANC adjustments

All of participants mentioned that some ANC service had been modified during the COVID-19 pandemic. The ANC service were redesigning in order to reduce the COVID-19 transmission between patient and health care provider. The redesigning of routine ANC program such as the assess only data focus related pregnancy, shortened the ANC duration, and cancel the pregnancy class.

> …They asked me some questions such as do I have flu like or fever now, then they measure my blood pressure, my weight, and assess my fetus in the womb in a very short duration…the midwife did a quick physical examination…(P9, Primiparous, 24 years old)

Health care providers confirmed the ANC procedures had been adjusted to prevent the COVID-19 transmission. Health care providers applied a new adaptation era guidance for ANC from Indonesia Ministry of Health such as early screening, separating healthy and suspected pregnant women, seating/room arrangement.

> ...We provide ANC using a new adaptation era guidance from Indonesia Ministry of Health such as screening the pregnant women's temperature, assess their symptoms such

as having cough, cold, or travelling history before physical examination…we adjust the ANC procedures and duration in order to prevent the COVID-19 transmission…we also cancel the prenatal class during the COVID-19 pandemic…(P30, Midwife, 3 years old)

Focus on high risk pregnancy

Health care providers explained that the ANC examination during the COVID-19 pandemic focus on the patient's health problems and complaints. Pregnant women with no problems may delay ANC visitation to PHC in order to minimize the risk of infected COVID-19. Health care providers made a home visit to high risk pregnancy women to keep the pregnant women stay at home and prevent them being infected.

…We re-arrange ANC schedule to low risk pregnancy to prevent them being infected COVID-19 and we also do home visit for high risk pregnant women to keep them stay at home...(P31, Midwife, 43 years old)

…The midwife came to my house and did physical examination to me, she explained that I just stay at home during this time and she would come next months in order to make me safe……(P20, Multiparous, 40 years old)

Insufficient information

All participants explained that they receive insufficient information during ANC. They mentioned that the ANC assessment duration were very short. They explained that there is no discussion or health education from health care providers during ANC. They had no chance to express their feeling and ask some questions related to their pregnancy. They mentioned about using of social media to facilitate discussion with health care providers and get pregnancy related health promotion.

…when I have ultrasound examination, the doctor did it quickly and did not explained the results in detail…he just say that it's good and normal, the doctor didn't give me the opportunity to express my feeling or ask some questions about my pregnancy…(P10, Multiparous, 32 years old)

…I meet the midwife in ANC room at a very short time…she did a quick physical examination, did not give much information about the examination results, and did not explain about my fetus conditions in detail…maybe we can use social media to communicate with health care providers and get some pregnancy related health promotion…(P11, Primiparous, 22 years old)

COVID-19 preventive behavior's adherence

All participants explained that they must adhere COVID-19 preventive behaviors when going outside home. They had to wear mask, wash hands, and made a physical distancing when they attended ANC. There is a big banner involve information about COVID-19 preventive behavior in front of the PHC office.

…I always wear mask, wash hands in the washing basin which placed in front of the PHC, and sit down not too close with other patients in the PHC…there is a person in charge who always remind us to wear mask, wash hands, and make distance with other people…(P14, Multiparous, 30 years old)

Health care providers confirmed that there is a big banner in front of the Primary Health Center to inform patients about COVID-19 prevention behavior. Health care providers always remind patient to follow the COVID-19 prevention behavior and provide washing hand basin in front of the PHC and health care providers wearing additional personal protective equipment.

> ….We provide health care services in the PHC using a high standard of the COVID-19 preventive behavior…There I a big banner in from of the PCH informing the COVID-19 prevention behavior…we always remind patients to wear mask, make a physical distancing at least 2 meters, and wash our hands using water and soap before and after entering the PHC...health care providers should wear additional personal protective equipments…(P2, Head of PHC, 52 years old)

Discussion

Up to our knowledge, this is the first Indonesian study that investigated the pregnant mothers and health care providers challenging to conduct ANC during the COVID-19 pandemic. Despite challenges and restrictions during the COVID-19 pandemic, ANC services have had to continue providing a full range of services to the pregnant population. Some services are modified in order to provide not only high quality ANC service but also prevent the COVID-19 transmission (25). In addition, the number of ANC visit decrease during the COVID-19 pandemic particularly among pregnant women in rural area (25). Pregnant women living in rural area significantly correlated with the low utilization of ANC service (26). This might be due to fear to be infected COVID-19, transportation problems, distance from health facilities, the Indonesia Government's policy, health care services changing, and lack of awareness about the ANC benefits.

This study finding proved that most pregnant women feel fear and anxious due to the COVID-19 transmission. Pregnant woman is a vulnerable group whom increase the probability to get worsening when infected the COVID-19 since the change of the maternal immune responses and increasing the sensitivity to respiratory pathogens (18). Most Indonesian pregnant women in this study attended ANC in PHC however, they feel fear of the COVID-19 transmission in the health care center. Similarly, previous studies found that pregnant women during the COVID-19 missed ANC visits and feel fear to give birth in health facilities since afraid themselves or their infants infected in health facilities (27), desired to do pregnancy self-monitor but have no sufficient knowledge, perceived have to strictly isolated at home, and expected pregnancy consultation using telemedicine (28). Fear was the most important factor of maternal care reduction during the COVID-19 pandemic and Israeli women feel threat with the COVID-19 transmission in health care center so they refute to visit the health care center for ANC (29). A large survey finding revealed that greater anxiety experienced by pregnant women particularly related to family visit post-delivery restriction, the possibility of baby

being infected, lack of support during delivery, and delivery plan changing (30). Anxiety related to the COVID-19 transmission also experienced by workers in Finland particularly among women and young people (31). Unsurprisingly, the combination of pregnancy and working status increase the anxiety of getting infected among Indonesian working women whom get pregnancy during the COVID-19 pandemic.

This study revealed that Indonesian pregnant women not only feel fear to be infected COVID-19 but also worried that she will transmit COVID-19 from herself to other family members who have comorbid diseases since the majority of them live in extended family. Pregnant women in Iran also experienced fear, obsession, boredom, nervousness, and despair during the COVID-19 pandemic because the COVID-19 virus is highly contagious (32). Having an extended family is common for people living in the rural area of Indonesia. The majority of participants in this study living together with their parents, parents in law, grandparents who have comorbid disease. Fear of COVID-19 transmission may be caused by low adherence to health care protocols among people live in the rural area. People living in rural area explained that they feel discomfort wear mask and want to join neighborly social interaction. Urban residents experienced that it easier to share knowledge about COVID-19 (33), advised others to do preventive behaviors compare to rural residents (33) in addition rural residents were more likely to have negative attitude of doing preventive behaviors and had lower levels of information evaluation abilities (34). The low adherence of COVID-19 preventive behaviors among people in rural area might be due to low health literacy and lack of COVID-19 preventive information. One study did find that people who had adequate knowledge about COVID-19 were more likely to perform appropriate preventive behavior and urban residents were more likely to practice good preventive behavior compared to rural residents (Birhanu Gutu, Genene Legese, 2021).

The qualitative findings of this study further illustrate that the COVID-19 affected public transportation barriers and social activity restriction. The Indonesian government has made regulations to limit non-essential mobilization and activities that have the potential to cause crowds in order to prevent the spread of COVID-19 (37). Participant in this study reported that their mobility was limited due to the Indonesia Government policy to limit social mobility during the COVID-19 pandemic. They find difficulty to get public transportation to attend ANC during the pandemic. A previous study also reported pregnant women face a difficulty to access public transportation during the COVID-19 pandemic resulted delay to attend ANC (Babu Karavadra, Andrea Stockl, 2020). In addition, having close relationship between extended family members is a characteristic of people living in a rural area. They help,

take care, and support each other. During the COVID-19 pandemic, pregnant women have a social contact limitation, they got social support only from their husband and other family members. Social support from family members, friends, and significant others contributed to protect and develop resilience among pregnant women, affect perinatal mental health, and obstetric outcomes (38). Having a lot of social activities is part of daily life of people living in the rural area of Indonesia. They commonly go to their neighborhood's home, prayer together in the mosque, coming to funeral, attending recitation, wedding ceremony, or social gathering.

Related to the ANC program modifications during the COVID-19 pandemic, our participants highlighted that the health care providers deliver essential services, high risk pregnancy early detection, emergency services, and prevention the COVID-19 transmission among health care providers. The Ministry of Health launched the perinatal and newborn health service guideline to guide the health care providers in deliver their health care services, such as general precautions principals, health facilities readiness, perinatal care recommendations, and health services for maternal and newborn in new normal era (25). Health care providers in this study explained that they should redesign ANC programs, limit prenatal examination duration, doing home visits, limit the number of prenatal class participants in order to prevent the COVID-19 transmission.

The purpose of ANC program adjustments is to save both health care providers and pregnant women from the COVID-19 transmission particularly during the July 2021 when the COVID-19 daily cases in Indonesia reach the highest level of new cases and total cases (3). Unsurprisingly, the maternal health services situation during COVID-19 pandemic is more difficult for developing countries because lack of sufficient infrastructure and resources, health system collapse, workforce lessening, access decline, and number of ANC visits lessening in order to prevent pregnant women infected COVID-19 (26). Consistent with a study in Kenya which reported that health care providers made some ANC program modifications such as decrease the ANC visitation to hospital and increase networking between community health workers and communities (43). Participants in this study reported that they lack of detail ANC assessments and results information from health care providers. They did not have sufficient time to discuss about their pregnancy with health care providers during ANC. Pregnant women who stated dissatisfaction with ANC services mostly associated with restrictions during the COVID-19 pandemic caused ANC visitation and pregnancy classes were cancelled or suspended (44). Another study revealed that pregnant women did not examined in detail during ANC which may cause missing some important aspect in their pregnancy and they provide insight to use social media or written documents to get information from health care providers

during COVID-19 pandemic (Babu Karavadra, Andrea Stockl, 2020). Pregnant mothers mentioned that social media is useful to provide antenatal care and support during the COVID-19 pandemic particularly to deliver pregnancy related information, managing isolation feeling, service specific issues, and routine care (John Cahtwin, Danielle Butler, 2020). The use of social media is an interesting way to communicate and deliver health promotion to pregnant women which mentioned as the participant's need in this study.

For health promotion behavior while attending ANC, participants in this study mentioned that they made some lifestyle changing. Good preventive behavior among pregnant women was found to be were significantly associated with fear of becoming infected and having good knowledge about the COVID-19 preventive behavior (40). Participants in this study understand that pregnant women are a vulnerable group due to immune response, so they must rigorously implement prevention from the COVID-19 infection behavior such as wearing masks, handwashing using water and soap, and make physical distancing everywhere, including during attending ANC in the PHC. The adherence to the COVID-19 preventive behavior may be due to Indonesia Government massive publicity using several mass media.

Strengths and limitations

A strength of this study is using open-ended questions providing a rich data for qualitative analysis. This study is still relevance with current situation to improve maternal health service in the COVID-19pandemic era. The principal limitations of this study were limited generalizability of the study findings, as all of our participants were Javanese ethnicity, married women, and attending ANC during the pandemic. These biases may reflect the level of pregnant women awareness to perform ANC during the pandemic. Further research would be required to examine the effect of social media to improve communication between health care providers and pregnant women.

Conclusions

This study highlights a substantial impact of COVID-19 pandemic on antenatal care services in rural area of Indonesia. It provides additional evidence that contributes to the growing body of research outlining the challenging antenatal care in the rural area during the COVID-19 pandemic. Our findings indicate providing update information about impact of COVID-19 on pregnant women to attend ANC. Continuous health care providers support should be taken into consideration in the maternity services in response to the pandemic. Limited interactions with healthcare care providers should be recognized as in the next perinatal program using a social media platform to meet both pregnant women need and prevent the COVID-19 transmission.

Declaration

-Ethical approval and consent: All methods were carried out in accordance with relevant guidelines and regulations. All procedures were approved by the Institutional Review Board Faculty of Medicine, Universitas Jenderal Soedirman. Informed consent was obtained from all subjects and/or their legal guardian(s)

-Consent to publish: Not applicable

-Availability of data and material: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

-Conflict of interest: There is no conflict of interest to declare

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-Author's contribution: MDA conceptualized and designed the study, wrote, and revised the final manuscript. RS analyzed the data and critically reviewed and revised the manuscript. ET designed the study, analyzed the data, and critically reviewed and revised the manuscript. AI contributed to collected data and assisted with data analysis, critically reviewed, and revised the manuscript. DN analyzed the data, and critically reviewed and revised the manuscript. AF contributed to collected data, critically reviewed, and revised the manuscript.

-Author's information: MDA is a female, Doctor in Nursing Science with research interest of maternal care and women health, experiencing some qualitative studies and following some qualitative study trainings. RS is a female, a Master in Nursing Science with research interest of Primary Health Care service, community and family health, experiencing some qualitative studies and following some qualitative study trainings. ET is a male, Doctor in Nursing Science with research interest of community and family health, experiencing some qualitative studies and following some qualitative study trainings. AI is a male, Master in Nursing Science with research interest of community health nursing care. DN is a female, Doctor in Nursing Science with research interest of maternal and childcare. AF is a male, Doctor in Chemistry with research interest of bioanalysis for medical applications.

Table 3 Participants demographic data

Participant	Age	Parity	Education level	Occupation
P1	36	Multiparous	Senior High School	Housewife
P2	29	Multiparous	Bachelor Degree	Private employee

P3	36	Primiparous	Senior High School	Housewife
P4	31	Multiparous	Bachelor Degree	Government employee
P5	41	Multiparous	Elementary School	Housewife
P6	28	Primiparous	Senior High School	Housewife
P7	27	Primiparous	Bachelor Degree	Government employee
P8	39	Multiparous	Senior High School	Private employee
P9	24	Primiparous	Senior High School	Housewife
P10	32	Multiparous	Elementary School	Housewife
P11	22	Primiparous	Bachelor Degree	Private employee
P12	40	Multiparous	Junior High School	Seller
P13	19	Primiparous	Senior High School	Housewife
P14	30	Multiparous	Junior High School	Housewife
P15	36	Multiparous	Bachelor Degree	Private employee
P16	23	Primiparous	Senior High School	Private employee
P17	39	Multiparous	Junior High School	Housewife
P18	34	Multiparous	Junior High School	Housewife
P19	37	Multiparous	Junior High School	Housewife
P20	40	Multiparous	Senior High School	Private employee
P21	27	Primiparous	Senior High School	Housewife
P22	38	Multiparous	Bachelor Degree	Teacher
P23	29	Multiparous	Junior High School	Housewife
P24	31	Multiparous	Senior High School	Housewife
P25	43	Multiparous	Elementary School	Housewife
Participant	**Age**	**Gender**	**Education**	**Occupation**
P26	34	Female	Bachelor of Nursing	Nurse

P27	52	Male	Bachelor of Public Health Science	Head of PHC
P28	45	Female	Medical Doctor	Doctor
P29	38	Female	Diploma of Midwifery	Midwive
P30	39	Female	Diploma of Midwifery	Midwive
P31	43	Female	Diploma of Midwifery	Midwive

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Salam,
MDA

---------- Forwarded message ---------
From: **BMC Pregnancy and Childbirth** <bmcpregnancyandchildbirth@biomedcentral.com>
Date: Fri, Dec 9, 2022 at 6:42 PM
Subject: BMC Pregnancy and Childbirth: Decision on your manuscript
To: <mekar.anggraeni@unsoed.ac.id>

[Quoted text hidden]

4 attachments

BMC_ANC during Covid-19 Pandemic_Revised.docx
91K

Response to editor and reviewer .docx
150K

COREQ_checklist_Mekar.pdf
473K

BMC_ANC during Covid-19 Pandemic-original artikel.docx
81K

Endang Triyanto <endangtriyanto@yahoo.com> Wed, Dec 21, 2022 at 5:22 AM
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>

Maaf baru balas Bu...
Pada halaman 4 di sub bab Setting, masih ada kalimat berbahasa indonesia (bukan kutipan).
Kalo baca daftar revisi, sepertinya sudah lengkap Bu

[Quoted text hidden]

Rahmi Setiyani <rahmi.setiyani@gmail.com> Wed, Dec 21, 2022 at 8:18 AM
To: Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id>
Cc: endangtriyanto@yahoo.com

Dear all,

1. Sepertinya all covered siy. Mudah2an link antara objectives dan findings bisa diterima.
2. Untuk COREQ_checklist sepertinya harus diindikasikan di section mana item tersebut dituliskan (tidak hanya sekedar tanda centang), merujuk ke kalimat ini Please indicate in which section each item has been reported in your manuscript.
3. Personal characteristics-relationship established dan participant knowledge of the interview: sepertinya belum ada informasinya di text. Tapi mungkin saya terlewat membaca.
4. Data collection-Repeat interviews: sepertinya belum ada informasinya di text. Tapi mungkin saya terlewat membaca.

Trims
RS
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Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Fri, Dec 23, 2022 at 8:12 PM
To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Tanay Rao,
Editor of BMC Pregnancy and Childbirth,

I would like to ask for revision time extension to January 5, 2023 due to Christmast and New Year Holiday.
The manuscript is under proofread by a British proofreader.

Thanks for your attention.

Best regards,
Mekar Dwi Anggraeni

[Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Mon, Dec 26, 2022 at 7:29 AM
To: BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Dr. David Mukunya,
Editor of BMC Pregnancy and Childbirth,

I would like to ask for revision time extension to January 5, 2023 due to Christmast and New Year Holiday.
The manuscript is under proofread by a British proofreader.
I have sent this request to Dr. Tanay Rao three days ago.

Thanks for your attention.

On Fri, Dec 9, 2022 at 6:42 PM BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com> wrote:
[Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Mon, Dec 26, 2022 at 10:13 AM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Dear Dr Anggraeni,

Thank you for your email. This will not be a problem – we do appreciate that some revisions do take longer than others and we would be more than happy to accommodate an extension for you. Please submit your revised manuscript by 5-Jan-2023

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Fri, 23 Dec at 1:13 PM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> Dear Tanay Rao,
> Editor of BMC Pregnancy and Childbirth,
>
> I would like to ask for revision time extension to January 5, 2023 due to Christmast and New Year Holiday.
> The manuscript is under proofread by a British proofreader.
>
> Thanks for your attention.

Best regards,
Mekar Dwi Anggraeni

On Tue, 13 Dec 2022 at 10.37 Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> wrote:

> Dear Dr Anggraeni,
>
> Thank you for your response.
>
> Sincerely,
> Tanay Rao
> Editorial Support at BMC
>
> > On Mon, 12 Dec at 7:48 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> > **[External - Use Caution]**
> >
> > Dear David Mukunya,
> > [Quoted text hidden]
> > [Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Mon, Dec 26, 2022 at 3:34 PM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Thank you for your email. This will not be a problem – we do appreciate that some revisions do take longer than others and we would be more than happy to accommodate an extension for you. Please submit your revised manuscript by 5-Jan-2023.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Mon, 26 Dec at 12:30 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> [Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Fri, Jan 6, 2023 at 7:05 AM
To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Dr. Tanay Rao,
Editor of BMC Pregnancy and Childbirth,

I have submitted the revised manuscript, response to editor and reviewer's suggestions, and filled the COREQ checklist yesterday.
Please let me know if there is anything else I need to provide.
.
Thanks for your attention.

Best regards,
Mekar

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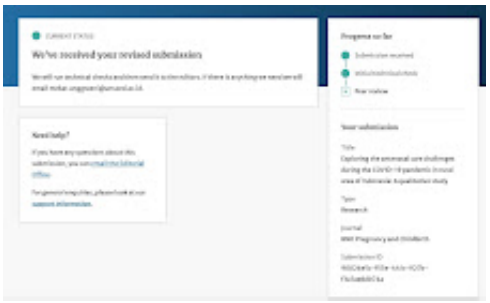

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Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Fri, Jan 6, 2023 at 11:20 AM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Dr Anggraeni,

Thank you for your response.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Fri, 6 Jan at 12:06 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> Dear Dr. Tanay Rao,
> Editor of BMC Pregnancy and Childbirth,
>
> I have submitted the revised manuscript, response to editor and reviewer's suggestions, and filled the COREQ checklist yesterday.
> Please let me know if there is anything else I need to provide.
> .
> Thanks for your attention.
>
> Best regards,
> Mekar
>
> > On Mon, Dec 26, 2022 at 3:35 PM Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> wrote:
> >
> > Dear Dr Anggraeni,
> >
> > Thank you for your email. This will not be a problem – we do appreciate

that some revisions do take longer than others and we would be more than happy to accommodate an extension for you. Please submit your revised manuscript by 5-Jan-2023.

Sincerely,
Tanay Rao
Editorial Support at BMC

On Mon, 26 Dec at 12:30 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:

[External - Use Caution]

[Quoted text hidden]

BMC Pregnancy and Childbirth: Decision on your manuscript

7 messages

BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com> Thu, Feb 23, 2023 at 9:08 AM
To: mekar.anggraeni@unsoed.ac.id

Ref: Submission ID 90026e5c-f55e-441c-927b-f3a7ae8d074a

Dear Dr Anggraeni,

Re: "Exploring the Antenatal Care Challenges faced during the COVID-19 Pandemic in Rural Areas of Indonesia: A Qualitative Study"

We are pleased to let you know that your manuscript has now passed through the review stage and is ready for revision. Many manuscripts require a round of revisions, so this is a normal but important stage of the editorial process.

Editor comments
Thank you so much for addressing the reviewer's comments. We request some extra minor revisions as highlighted by one of the reviewers. In addition, I kindly request them to do further English editing as a couple of spelling and grammar errors are still present in the current write-up.

To ensure the Editor and Reviewers will be able to recommend that your revised manuscript is accepted, please pay careful attention to each of the comments that have been pasted underneath this email. This way we can avoid future rounds of clarifications and revisions, moving swiftly to a decision.

Once you have addressed each comment and completed each step listed below, the revised submission and final file can be uploaded via the link below.

If you completed the initial submission, please log in using the same email address. If you did not complete the initial submission, please discuss with the submitting author, who will be able to access the link and resubmit.

https://submission.springernature.com/submit-revision/90026e5c-f55e-441c-927b-f3a7ae8d074a

You can visit https://researcher.nature.com/your-submissions to track progress of this or any other submissions you might have.

CHECKLIST FOR SUBMITTING YOUR REVISION

1. Please upload a point-by-point response to the comments, including a description of any additional experiments that were carried out and a detailed rebuttal of any criticisms or requested revisions that you disagreed with. This must be uploaded as a 'Point-by-point response to reviewers' file.

Please note that we operate a transparent peer review process, where we publish reviewers' reports with the article, together with any responses that you make to reviewers or the handling Editor.

2. Please highlight all the amends on your manuscript or indicate them by using tracked changes.

3. Check the format for revised manuscripts in our submission guidelines, making sure you pay particular attention to the figure resolution requirements:

https://bmcpregnancychildbirth.biomedcentral.com/submission-guidelines

Finally, if you have been asked to improve the language or presentation of your manuscript and would like the assistance of paid editing services, we can recommend our affiliates, Nature Research Editing Service: https://authorservices.springernature.com/language-editing/ and American Journal Experts: https://www.aje.com/go/springernature

Please note that use of an editing service is neither a requirement nor a guarantee of publication. Free assistance

is available from our resources page: https://www.springernature.com/gp/researchers/campaigns/english-language-forauthors

To support the continuity of the peer review process, we recommend returning your manuscript to us within 14 days. If you think you will need additional time, please let us know and we will aim to respond within 48 hours.

Kind regards,

David Mukunya
Editorial Board Member
BMC Pregnancy and Childbirth

Reviewer Comments:

Reviewer 1
No further comment

Reviewer 2
Dear Authors,
I take this opportunity to congratulate you on the great improvement noted in the manuscript. That was excellent work. The reviewer's comments were well addressed. From the second review, a few more areas have been noted for improvement.
A brief guide on numbering the sentences in the manuscript;
Go to layout, then line numbers (click the arrow pointing down), then click continuous, all the sentences in the text will be numbered automatically and continuously.
Having done that, you will be able to locate the few comments or edits below.
Abstract
Sentence 14, remove the comma after "pandemic"
Sentence 17, put a comma after study and therefore
Sentence 33 to 35; you could re-state as" these findings demonstrate the need to formulate and implement ANC packages to facilitate pregnant women's access to health care services
Sentence 45, let it be "pregnant women"
Sentence 49, write the abbreviation ANC in full since it is starting the sentence
Sentence 57, is that "assure" or "ensure", kindly use the right word
Sentence 74, delete repeated "in"
Sentence 78, delete "an"
Sentence 83, delete "having"
Sentence 87, "fear of transmission from health care providers to the list" what does this mean?
Sentence 149, "were and were" this phrase has an error, please correct it
Sentence 150, please delete "using"
Sentence 161, delete "first in" and replace "took part" with "participated"
Sentence 179 to 181, let the sentence be "The in-depth interviews were conducted by a researcher holding a master's degree in community health and has experience in carrying out qualitative research"
Sentence 192, delete "were"
Sentence 225, replace "to have" with "that"
In sentences 261 to 263, it looks like this statement is a repetition "Either a written or electronic informed consent form was obtained by each participant before involvement in the study". Please look at it and retain if it's different from the one before it.
Results
The findings of the study appear well-written.
Discussion
My thoughts on the discussion,
In the second and third paragraphs, you may need to revise the use of the term contracting. For instance, you may use "virus infection" instead of virus contraction. This is because "virus contraction" in sentence 440 doesn't seem to make sense.
In the acknowledgement section, you may also want to appreciate your participants and the data collection team.

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Thu, Feb 23, 2023 at 9:18 AM
To: Rahmi Setiyani <rahmi.setiyani@gmail.com>, Amin Fatoni <aminfatoni@gmail.com>, endangtriyanto@yahoo.com

Dear all,

Minta saran terkait komentar editor yang ini:

Exploring the Antenatal Care Challenges faced during the COVID-19 Pandemic in Rural Areas of Indonesia: A Qualitative Study

Mekar Dwi Anggraeni[1*], Rahmi Setiyani[1], Endang Triyanto[1], Asep Iskandar[1], Desiyani Nani[1], Amin Fatoni[2]

[1]Nursing Department, Faculty of Health Sciences, Universitas Jenderal Soedirman
[2]Chemistry Department, Faculty of Sciences, Universitas Jenderal Soedirman
*Corresponding author: mekar.anggraeni@unsoed.ac.id

Abstract

Introduction: The COVID-19 pandemic affected almost all healthcare services in Indonesia, including antenatal care (ANC). Pregnant women were a vulnerable group during the pandemic since the Indonesian government's policies at the time influenced the delivery of ANC services, particularly in rural areas. Investigating the ANC challenges faced during the pandemic from the perspectives of pregnant women and healthcare providers is important for our understanding of ANC provision. This study, therefore explores barriers to ANC appointments faced during the COVID-19 pandemic in rural areas of Indonesia from the perspectives of pregnant women and health care providers.

Methods: This was a qualitative exploratory descriptive study involving 31 participants, consisting of 25 pregnant women and six healthcare providers who were selected via a purposive sampling method. Thadeus and Maine's Three Delays Model was used as the theoretical framework. Data were collected between March and August 2021, through two focus group discussions (FGDs), ten in-depth interviews, and field notes. Data were analyzed using a thematic analysis method.

Results: Three themes describing barriers to ANC during the COVID-19 pandemic in rural areas of Indonesia emerged from this study. Those themes were: 1) The fear of being infected with COVID-19, related to anxiety, perceived vulnerability, and the desire to protect oneself and loved ones; 2) The stay-at-home policy, related to transport barriers and restricted social activity; and 3) Re-designed ANC services, related to ANC adjustments, high-risk pregnancies, insufficient information, and adherence to COVID-19 preventive behaviors.

Conclusion: Based on the Three Delays Model, several challenges to carrying out ANC during the COVID-19 pandemic in rural areas of Indonesia were identified. These findings demonstrate the need to formulate and implement ANC packages to facilitate pregnant women's access to health care services.

Keywords: Antenatal care, COVID-19, Indonesia, Pregnancy, Rural areas

Introduction

In 2020, the COVID-19 pandemic was declared an international public health problem (1). The virus spread massively to all regions of Southeast Asia, with the total number of confirmed cases and deaths in Indonesia up to September 3rd 2021 reaching 4,116,890 and 134,930 respectively (2). These figures meant that Indonesia ranked 13 globally in terms of total COVID-19 confirmed cases (3). The pandemic affected all aspects of life in Indonesia, including routine health services such as antenatal care (ANC). Pregnant women were one of the most vulnerable groups during the pandemic (4), and, despite the disruption, they were still encouraged to engage in ANC during the period because of the massive health benefits associated with ANC. Despite this, ANC coverage in Indonesia has decreased over the past two years. Antenatal care coverage among pregnant Indonesian women was 88%, 88.5%, and 84.6% in 2018, 2019, and 2020 respectively (5-7). The noticeable decline in ANC coverage in 2020 might be due to the pandemic. The Indonesian government reported the first case in Indonesia on March 2nd, 2019. Following that, the Indonesian Obstetrics and Gynecologists Association announced that 20% of MMR cases in the country between the beginning of 2020 and August 2021 were related to COVID-19 (8). A similar study in Brazil found that 13.19% of maternal deaths in 2020 were linked to COVID-19 (9).

ANC is essential care that should be provided to all pregnant women. The main aim of ANC is to ensure that every pregnancy ends in the delivery of a healthy infant without any undesirable effects on the health of women, and this is achieved through health promotion, disease prevention, early detection, and management of complications and existing diseases (10). There is less ANC coverage for pregnant women living in developing countries than those in developed countries, particularly in rural areas that lack healthcare providers and facilities (11) Irregular ANC is associated with complications during pregnancy, delivery, and puerperium for both mother and infant, including preeclampsia, eclampsia, anemia, preterm birth, low birth weight, and stillbirth (12). Occasionally, pregnancy triggers diseases such as pregnancy-induced hypertension, gestational diabetes, pre-eclampsia, and eclampsia (13).

Although most maternal deaths linked to COVID-19 have occurred in pregnant women with comorbidities, previous studies have confirmed that COVID-19 in pregnant women may cause severe outcomes such as abortion (14) and increased maternal morbidity and mortality, pre-eclampsia, and preterm birth (15). One study carried out in India found that during the pandemic, the number of deliveries taking place in institutional hospitals reduced by 45.1%, while high-risk pregnancies increased by 7.2%, admission to intensive care units saw a 2.5-fold increase, and one-third of pregnant women experienced inadequate ANC. The authors

stated that the principal reasons for delayed health-seeking behaviors were lockdown and fear of transmission, and this resulted in 44.7% of pregnancies developing complications during that period (16). Another study found that access to and continuity of ANC, particularly with regard to the early detection of COVID-19 symptoms, is highly recommended (17). This could be because pregnant women tend to be relatively immunodeficient which could worsen an infection and lead to bad outcomes for mothers and fetuses (18). It is clear to see that ANC is hugely important among pregnant women.

Attending ANC appointments was more challenging during the COVID-19 pandemic worldwide. One study carried out in India found that of 144 pregnant women, two thirds reported at least one barrier to ANC during the pandemic, with one third reporting fear, and more than three quarters refused ultrasound assessments and blood tests (19). Another study identified the main barriers to ANC during the pandemic as being health facility-related barriers, poor quality of care, government regulations, anxiety, and fear of infection (20). Another study added closing hospital/healthcare centers, the involvement of private health sectors, lack of transport, and fear of transmission from health care providers to be the major barriers to ANC during the pandemic (21). The authors of one study cited lack of social support from husband, restricted face-to face interaction with health professionals, lack of information on COVID-19, and high uncertainty about pregnancy and birth during the pandemic as being the main ANC barriers (22). Psychosocial challenges such as social isolation, lack of information about neonatal care, lack of public transport, and lack of up-to-date information related to COVID-19, particularly among women in low-and middle income countries were cited as the main factors in another study (23). Pregnant women from low socio-economic classes with pre-existing pregnancy complications were more likely to experience barriers to ANC (19). To date, little is known about the ANC challenges faced by Indonesian women during the pandemic, particularly those in rural areas who already faced a lot of barriers to ANC. Since ANC challenges during the COVID-19 pandemic in rural areas of Indonesia have not yet been sufficiently explored from the perspective of pregnant women and their healthcare providers, the knowledge provided in this study could be used to develop an appropriate and safe ANC program for pregnant women living in rural areas.

Methods

Aim

The aim of this study was to explore the ANC challenges during the COVID-19 pandemic in rural areas of Indonesia.

Study design

A qualitative exploratory descriptive design was applied since it was deemed the best way of answering the who, what, and where of experiences and of obtaining insights from participants about an inadequately understood phenomenon (24, 25). The qualitative method emphasizes deep understanding, complexity, and details of the phenomena under study, and the researcher was actively involved in the research process. The Three Delays Model developed by Thaddeus and Maine was used as the framework for this study (26).

Setting

Indonesia is the most populous nation in Southeast Asia. It also has one of the highest MMR rates in the region (27), with around 305 MMR incidents occurring per 100,000 live births (28). Indonesia is divided into 38 provinces and is home to over 300 ethnic groups. The biggest ethnicity in Indonesia is Javanese which accounts for around 41.71% of the total population, the majority of whom live in rural areas (29). The third highest number of MMR cases in the country are found in Central Java Province. Data were collected in Banyumas District, the area with the sixth highest rate of MMR cases in the province. There are 17 hospitals and 30 primary health centers (PHCs) in Banyumas District, however, ANC coverage there remains lower than the national average. The district is one of the lowest 10 districts for ANC coverage in Central Java Province (30). The study was conducted between April and August 2021. Most pregnant women attend ANC in a primary health center according to Ministry of Health policies, but high-risk pregnancies may be referred to secondary or tertiary hospitals, depending on the severity of their pregnancy-related problems.

Participants

Included in this study were pregnant women and healthcare providers living or working in rural areas. A purposive sampling technique was used to select the study participants. The inclusion criteria for pregnant women were those in their second or third trimester who had attended ANC at least three times in a PHC. Participants were recruited through the PHC list of pregnant women and all those meeting the inclusion criteria who agreed to participate in the study were invited for data collection. Women whose pregnancy was deemed high-risk were excluded from the study. The inclusion criteria for healthcare providers were those who worked in a

PHC providing ANC that had had at least three years' experience. Healthcare providers were selected purposively and sent a formal invitation to participate in the study by post. A total of 31 participants including 25 pregnant women and six healthcare providers agreed to participate in the study and were invited to attend focus group discussions (FGDs) and in-depth interviews.

Data collection

Data collection only began after the researchers received approval from the Institutional Review Board (IRB) of the Faculty of Medicine, Universitas Jenderal Soedirman. Data were collected by the researchers, all of whom are faculty members of the nursing department in the Faculty of Health Sciences, Universitas Jenderal Soedirman. Most researchers were of Javanese ethnicity, familiar with the principles of qualitative research and interview guidelines. Prospective participants were selected with consideration given to their social, economic, and demographic characteristic, including age, level of education, employment status, and parity for pregnant women, and length of work experience for healthcare providers, since a greater diversity of study participants allows for a more in-depth exploration and analysis of a phenomena. To adhere the Declaration of Helsinki for studies involving human subjects and ethical issues, each participant was informed of the study's purpose, procedure, and risks, and told that participation was voluntary and that they could quit at any time without facing any consequences. Pregnant women choosing to withdraw from the study knew that they would continue to receive ANC in their PHCs as usual. The researchers also guaranteed confidentiality and anonymity of participants' information.

Two FGDs were conducted for the purpose of this study. Twelve pregnant women participated in first FGD and nine pregnant women took part in the second. The study was conducted between March and August 2021. Because the COVID-19 situation worsened in Indonesia in July 2021, it was not possible to conduct another FGD and so the data collection method switched to in-depth interviews conducted through online interviews. At this point, the researchers conducted ten in-depth interviews to four pregnant women and six healthcare providers using video calls. The researchers initially met each participant in the PHC. There they introduced themselves, informed the participants of the study's aims, and shared contact information. The researchers then contacted each proposed participant via WhatsApp to gain their permission to participate in the study. Each participant was provided with an electronic informed consent form before starting the interviews, and any participant struggling to fill out the electronic version was provided with a hard copy. Researchers verbally told all participants that the interviews would be recorded and transcribed.

Information related to demographic characteristics was collected before the FGDs began. The FGDs were conducted in the Bahasa Indonesia language using interview guidelines by a researcher who was an expert in community health nursing and familiar with the FGD process. The researcher leading the FGDs holds a doctoral degree in community health and has experience in carrying out qualitative research. The first FGD was conducted in the meeting room at the PHC and the second FGD was conducted in the meeting room of the Sub-District Government Office. The in-depth interviews were conducted by a researcher holding a magister degree in community health and has experience in carrying out qualitative research. The researchers introduced themselves as faculty members in Universitas Jenderal Soedirman and let participants know they were free to talk with them.

All discussions and interviews were audio recorded for verbatim transcription. During the FGDs, researchers encouraged participants to share their knowledge, feelings, and experiences regarding ANC coverage during the COVID-19 pandemic, and another researcher observed and took notes to supplement the audio recorded FGDs. The observations were used to confirm the results from the FGDs and in-depth interviews to enrich the data. Only researchers and participants attended the FGD sessions to ensure confidentiality and privacy.

In a qualitative study, data saturation is reached when extending the interviews delivers no new data and all founded codes are recurrent (24). In this study, saturation was achieved with the 31st participant. At this point, the researchers ended the data collection, meaning there were 31 participants were involved in this study, ten of whom met on an individual basis and the others of whom attended the two focus groups. Each interview and FGD lasted around 60 and 90 minutes respectively. No repeat interviews were carried out and two prospective participants declined to participate, citing busy schedules.

Research instrument

Data were collected using a semi-structured interview guideline that was developed based on the literature review on ANC in the COVID-19 pandemic situation. A panel of experts consisting of a maternity nurse and two lecturers from the maternity department reviewed the interview guidelines for their relevance to the study's purpose. The interview guidelines were also verified and pilot tested on five pregnant women not involved as study participants. The FGDs and in-depth interviews used semi-structured questions, and probes were used to elicit further descriptions of challenges and experiences.

Data analysis

Data were analyzed using a thematic analysis method included six phase framework for doing a thematic analysis included familiarized themselves with the data, produced initial codes,

searched for themes, evaluated the themes, defined and named the themes, and made the study report (31). Three researchers analyzed the data independently. These researchers analyzed the data manually. First, the data were transcribed the day after collection and were analyzed by the researchers to be familiar with the data. Data collection and data analysis were conducted simultaneously. The transcribed verbatim was carefully read and re-read by the researchers, and the researchers provided the participants with the opportunity to check the verbatim. Second, all the transcribed verbatim were carefully and precisely examined line by line to find initial codes, and then were categorized based on the meaning similarity. Data was cleaned by eliminating all distinguishable information, and the researchers created initial codes before interviewing the next participant. Third, the researchers developed sub-themes and themes based on the categorized data. They categorized the codes with associated meanings into one group called sub-themes and considered their significance. They then categorized all codes and categories into central categories called themes. Fourth, researchers worked together to evaluate the draft of themes in biweekly meetings. The entire research team then discussed the coding, categories, sub-themes, and themes and organized them into charts. Fifth, each member of the research team agreed upon the names of the themes and sub-themes, and some participants were asked to read the study results and give feedback about whether the themes accurately portrayed their views. Finally, the research team discussed and agreed upon the names of the final themes that emerged from this study before making the final report. The last phase is write-up study report following the consolidated criteria for reporting qualitative research (COREQ) (32). The demographic characteristics of the participants were presented in frequency, percentage, median, minimum, and maximum.

Trustworthiness

To assess the quality of the study data, the researchers used Lincoln and Guba's trustworthiness criteria (24). Most researchers in this study were Javanese and native residents of the region under investigation, and this helped gain participants' confidence and familiarity. The study included pregnant women and healthcare providers varying in age, parity, level of education, working status, and working experience to help identify different views and concepts and heighten credibility. During the study's execution, a qualitative research specialist observed the data collection and processing, and two qualitative researchers analyzed the data independently. The data collection, data analysis, and theory generation process can be audited, which heightens the study's dependability. The researchers attempted to avoid subjective prejudices by recording all FGDs and interviews, keeping accurate field notes, and avoiding interfering with the data analysis results, leading to better confirmability within the study. The

results were shared with participants who were asked to confirm whether they accurately reflected their experiences, leading to better transferability within the study.

Rigor

The interview guidelines were based on a literature review focusing on ANC coverage during the COVID-19 pandemic. The draft of interview guidelines was checked for clearness and modified based on suggestions made by a panel of experts and pregnant women independent of the study. It was then tested on five pregnant women and two healthcare providers. The data were translated into English at each stage of the data analysis process. Participants were given the opportunity to carry out member checking to validate the data and were asked for their opinions regarding the themes. The entire research team read and discussed the data to confirm the right information was reported. Three researchers involved in this study had previous experience in conducting and publishing qualitative studies, which further helped to ensure the rigor of the qualitative data.

Ethical consideration

Ethical approval for this study was granted by the IRB of the Medical Faculty, Universitas Jenderal Soedirman No 1204/KEPK/III/2017. Permissions were also granted by district assemblies and the District Ministry of Health. Researchers explained the research purposes, procedures, risks, participants' expected role, and the voluntary nature of participation in the study to each participant. Participants were also informed that they were free to leave the study any time and that this would not affect any healthcare services received by them. Either a written or electronic informed consent form was obtained by each participant before involvement in the study and agreement to audio record the discussion or in-depth conversation was also obtained. All participants' data were documented with codes to guarantee anonymity and only the research team had access to the research data to ensure confidentiality.

Results

The majority of pregnant women included in the study were between 20 and 35 years old (52%), multiparous (68%), housewives (68%), and had graduated from senior high school (40%). The healthcare providers included in the study consisted of three midwives (50%), a nurse (16.7%), a head of the PHC (16.7%), and a doctor (16.7%). The mean age of the healthcare providers was 41.83 years, with a range of 34-52 years. The majority of healthcare providers had more than 11 years' work experience (66.7%). Half of healthcare providers had completed either a bachelor's degree or diploma of midwifery (Table 1). The details of participant's demographic data were provided in Table 3.

Table 1. The participant's demographic data

Variables	Frequency (%)	Median (Min-Max)
Pregnant women		
Age (years)		31.5 (19-43)
<20	1 (4%)	
20-35	13 (52%)	
> 35	11 (44%)	
Parity		
Primiparous	8 (32%)	
Multiparous	17 (68%)	
Occupation		
Seller	1 (4%)	
Teacher	1 (4%)	
Housewife	15 (60%)	
Private employee	6 (24%)	
Government employee	2 (8%)	
Education		
Elementary School	3 (12%)	
Junior High School	6 (24%)	
Senior High School	10 (40%)	
University	6 (24%)	
Healthcare providers		
Gender		
Male	1 (16.7%)	
Female	5 (83.3%)	
Age (years)		41 (34-52)
20-35	1 (16.7%)	
> 35	5 (83.3%)	
Working experience		
5-10 years	2 (33.3%)	
>11 years	4 (66.7%)	
Education		
Bachelor of Public Health	1 (16.7%)	
Medical Doctor	1 (16.7%)	
Diploma of Midwifery	3 (50%)	
Bachelor of Nursing	1 (16.7%)	
Occupation		
Head of PHC	1 (16.7%)	
Medical Doctor	1 (16.7%)	
Midwives	3 (50%)	
Nurse	1 (16.7%)	

Themes

The themes emerged out of findings from in-depth interviews, focus group discussions, and field notes which were acquired from observations at the Primary Health Centers. Using the Three Delays Model by Thaddeus and Maine as the study framework, the researchers identified

three themes: 1) Fear of being infected with COVID-19, 2) The stay-at-home policy, and 3) Re-designed ANC services. Each theme was broken into sub-themes and the descriptive quotes for each sub-theme are illustrated in Table 2.

Table 2. Summary of themes and sub-themes from the transcribed data

Themes	Sub-themes
1. Fear of being infected with COVID-19	Anxiety
	Perceived vulnerability
	The desire to protect self and loved ones
2. The stay-at-home policy	Transport barriers to healthcare
	Social activity restriction
3. Re-designed ANC services	ANC adjustments
	Focus on high-risk pregnancy
	Insufficient information
	COVID-19 preventive behaviors adherence

1. Fear of being infected with COVID-19

According to Three Delays Models, the first delay is related to the decision to seek care. During the pandemic time, pregnant women often prefer to delay their ANC visit because they are afraid of being infected with COVID-19. This theme is comprised of three sub-themes: anxiety, perceived vulnerability, and the desire to protect self and loved ones.

Anxiety

Almost all of participants stated that the pandemic had made them feel anxious. Interacting with people outside the home induced anxiety of being infected with COVID-19.

> …I am very worried since I am pregnant … my office colleague was confirmed as having COVID-19 so I feel very anxious to have contact with other people including healthcare providers ... (P8, multiparous, 39 years old)

Many participants worried about their health condition because of their weak immunity status and knew that their risk of contracting the virus increased when they visited healthcare facilities for ANC.

> … I am scared because the immunity status of pregnant women is decreased and the COVID-19 virus spread very quickly, I really feel fear when I go to the PHC to attend ANC so, I prefer to delay my next ANC schedule … (P23, multiparous, 29 years old)

Perceived vulnerability

Another participant expressed having mixed feelings about getting pregnant at this time. She felt grateful because she had been trying to get pregnant for a long time. However, she knew that the fact she was pregnant during the COVID-19 pandemic made her more vulnerable and this hindered her ANC attendance.

> … I'm grateful and happy for my first pregnancy after having waited for a long time … however I'm a vulnerable person because I am pregnant during the COVID-19 pandemic, so I do not attend ANC regularly … I hope to contact healthcare providers using social media … (P3, primiparous, 36 years old)

The desire to protect self and loved ones

Some participants lived with members of other vulnerable groups such as the elderly, children, and people with co-morbidities. Some participants feared that engaging in activities outside the home increased their chances of being infected and they tried to minimize visiting places they deemed high-risk, such as clinics where ANC was carried out. Some participants preferred to delay ANC to prevent themselves or their children and parents from getting ill.

> ... I have to minimize visiting high-risk transmission places because I have children and my parents have co-morbidities. We have to take care of each other … I will delay my ANC until the COVID-19 situation improves … (P8, multiparous, 39 years old)

2. The stay-at-home policy

According to Three Delays Models, the second delay is related to identify and reach the health facility. During the COVID-19 pandemic, pregnant women prefer to delay their ANC visit due to Large Social Scale Restriction policy by Indonesia Government. This theme is comprised of two sub-themes: transport barriers to health care and restriction of social activities.

Transport barriers to health care

Participants disclosed that the COVID-19 pandemic had created several barriers to their daily activities. The Indonesian government's policy encouraged people to stay at home during the pandemic. Participants therefore faced public transport barriers to attending their ANC.

> … I faced difficulties attending ANC during the COVID-19 pandemic because of a lack of public transport due to the government's stay at home policy … it would be really helpful if I could have my healthcare consultations over social media ... (P14, multiparous, 30 years old)

Social activity restriction

Almost all participants described experiencing social activity restrictions during the pandemic due to government policies. Participants were encouraged to stay at home and not to attend activities involving a lot of people to prevent transmission.

> … My husband did not allow me to join social gatherings, recitations, or religious meetings during the pandemic … I had to follow the government's regulations and stay at home, and so I decided not to attend ANC this month … (P6, multiparous, 28 years old)

3. Re-designing ANC services

According to Three Delays Models, the third delay is related to receive appropriate treatment at the health facility. Health care providers re-design ANC services during the COVID-19 pandemic. This theme is comprised of four sub-themes: ANC adjustments; focus on high-risk pregnancy; insufficient information; and adherence to COVID-19 preventive behaviors.

ANC adjustments

All participants experienced some ANC services being modified during the pandemic. Many services were re-designed to reduce COVID-19 transmission. This meant ANC sessions were shortened and pregnancy classes were cancelled.

> … They asked me some questions such as whether I had flu-like symptoms or fever, then they measured my blood pressure and weight and assessed the fetus in my womb very quickly … the midwife did a quick physical examination … (P9, primiparous, 24 years old)

Healthcare providers confirmed that ANC procedures were adjusted to prevent transmission. The Indonesia Ministry of Health ANC adaptation guidance called for early screening, the separation of healthy women suspected of being pregnant, and modified seating and room arrangement.

> ... We provide ANC using a new adaptation era guidance from the Ministry of Health. We take pregnant women's' temperatures, assess symptoms such as coughs and colds, and ask their history before carrying out the physical examination … we adjusted the ANC procedures and duration to prevent COVID-19 transmission … we also canceled prenatal classes during the pandemic … (P30, midwife, 39 years old)

Focus on high-risk pregnancy

Healthcare providers said that the ANC examinations during the pandemic focused on patients' health problems and complaints, meaning that pregnant women with no problems were more likely to delay ANC to minimize risk. Healthcare providers made home visits to women with high-risk pregnancies to keep them safe.

> … We re-arranged ANC schedules for low-risk pregnancies to prevent infection and we made home visits to high-risk pregnant women to keep them at home ... (P31, midwife, 43 years old)

> … The midwife came to my house and did a physical examination. She explained that I should stay at home during this time and told me she would visit again in the following months to keep me safe … (P20, multiparous, 40 years old)

Insufficient information

All pregnant participants said they had received insufficient information during their ANC appointments. They maintained that ANC assessments were short in duration and that there was no discussion or health promotion given by healthcare providers. They were given no chance to express their feeling or ask questions related to their pregnancies, and they said they used social media to facilitate discussions with their healthcare providers and get pregnancy-related advice.

> … when I had my ultrasound examination, the doctor did it quickly and did not explain the results in detail … he just said it was good and normal. The doctor didn't give me the opportunity to express my feelings or ask questions about my pregnancy … (P10, multiparous, 32 years old)

> … I met the midwife in the ANC room for a very short time … she did a quick physical examination, did not give much information about the examination results, and did not explain about my fetus in detail … maybe I can use social media to communicate with healthcare providers and get some pregnancy-related advice … (P11, primiparous, 22 years old)

Adherence to COVID-19 preventive behaviors

All participants said that they adhered to COVID-19 preventive behaviors when going outside the home. They wore masks, washed their hands, and observed physical distancing when attending ANC. There is a big banner containing information about COVID-19 preventive measures in front of the PHC office.

> … I always wear a mask, wash my hands in the wash basin which placed in front of the PHC, and sit down not too close to other patients in the PHC … there is a person in charge who always reminds us to wear a mask, wash our hands, and keep a safe distance from other people … (P14, multiparous, 30 years old)

Healthcare providers confirmed that there is a banner in front of the PHC that informs patients about COVID-19 preventive behaviors. They maintained that they frequently reminded patients to follow the preventative measures, provided a hand washing basin outside the PHC, and wore additional personal protective equipment.

> …. We provide healthcare services in the PHC using a high standard of COVID-19 preventive measures … There is a big banner in front of the PCH informing patients of the COVID-19 preventive behaviors … we always remind patients to wear a mask, keep at least two meters distance from others, and wash their hands using water and soap before and after entering the PHC ... healthcare providers should wear additional personal protective equipment … (P2, head of PHC, 52 years old)

Discussion

To our knowledge, this is the first Indonesian study to investigate the barriers to ANC from the perspectives of pregnant mothers and healthcare providers during the COVID-19 pandemic. Despite facing many challenges and restrictions throughout the pandemic, healthcare providers have had to continue providing a full range of ANC services to the pregnant population. Some services were modified in order to prevent COVID-19 transmission (33). The number of ANC visits decreased during the pandemic, particularly among pregnant women in rural areas (33). This might have been due to fear of infection, transport problems, the fact that women lived far away from health facilities, the government's COVID-19 policies, changing healthcare services, or lack of awareness about the benefits of ANC.

Our findings show that many pregnant women were afraid of COVID-19 infection. Pregnant woman are particularly vulnerable to viruses due to changes to maternal immune responses and increased sensitivity to respiratory pathogens (18). Most pregnant women in this study attended ANC in PHCs however, this made them feel anxious. Our results are similar to those of a previous study that found that pregnant women during the pandemic missed ANC

visits and were afraid of giving birth in health facilities due to a fear of contracting COVID-19 (34). Our results also correlate to those of another study that discovered that while women desired to self-monitor their pregnancies, they did not have sufficient knowledge, and that they felt the need to strictly isolate at home and expected pregnancy tele-consultations (35). In our study, fear was the most important factor in reduced ANC during the pandemic, and this correlates to the findings of a study carried out in Israel, whereby women refused to visit healthcare centers for ANC out of fear of viral infection (36). A large survey found that pregnant women were particularly fearful of restrictions to family visits post-delivery, the possibility of their babies being infected COVID-19, the lack of support offered during delivery, and delivery plans changing (37). Anxiety related to COVID-19 transmission was also experienced by healthcare workers in Finland, particularly among women and young people (38). Unsurprisingly, our results show that the combination of pregnancy and working status increased the fear of viral transmission among Indonesian working women who conceived during the pandemic.

Our study shows that Indonesian pregnant women were not only scared of COVID-19 infecting themselves but also worried that they would transmit the virus to family members with comorbidities since most participants lived with their extended families. Pregnant women in Iran also experienced fear, obsession, boredom, nervousness, and despair during the pandemic due to the highly contagious nature of the virus (39). Living with the extended family is common for people living in rural areas of Indonesia. The majority of participants in this study lived with their parents, parents-in-law, or grandparents, many of whom had comorbidities. Fear of COVID-19 transmission among people living in rural areas may have been caused by low adherence to healthcare protocols. Participants in this study said they felt uncomfortable wearing masks and wanted to join their neighbors for social interactions. Urban dwellers in other studies found it easier to share knowledge about COVID-19 (40), advised others to carry out preventive behaviors (40), and were found to have less negative attitudes regarding preventive behaviors (41). The low adherence of COVID-19 preventive behaviors among people in rural areas might be due to low health literacy and lack of information. One study found that people with adequate knowledge of the virus were more likely to engage in appropriate preventive behaviors and that urban dwellers were more likely to practice good preventive behaviors than rural dwellers (42).

The qualitative findings of this study further illustrate that the pandemic affected public transport and restricted social activities. The Indonesian government restricted non-essential travel and group activities to prevent the spread of COVID-19 (43). Participants in this study

reported that public transport was limited due to government policies and so they found it difficult to attend their ANC appointments. These findings are similar to those reported in a previous study that also found that pregnant women faced difficulty accessing public transport pandemic, resulting in missed ANC appointments (44). Social support from family members, friends, and significant others contributes to developing resilience among pregnant women, positively affecting perinatal mental health and obstetric outcomes (45). Social activities are part of daily life for people living in Indonesia's rural areas. People are accustomed to visiting neighbors, praying together in the mosque, and attending funerals, recitations, wedding ceremonies, and social gatherings.

The Ministry of Health launched perinatal and newborn health service guidelines to guide healthcare providers in the delivery of healthcare services during the pandemic. The guidelines included information regarding general precautions, health facility readiness, perinatal care recommendations, and health services for maternal and newborns (33). Healthcare providers in this study described having to redesign ANC programs, limit prenatal examinations, carry out more home visits, and limit the number of prenatal class participants. These ANC program adjustments were made to protect both healthcare providers and pregnant women from COVID-19 transmission, particularly during July 2021 when daily cases in Indonesia reached the highest level (3). Unsurprisingly, the situation of maternal health services during a pandemic is more precarious in developing countries due to insufficient infrastructure and resources, the collapse of healthcare systems, decreased workforce, access decline, and fewer ANC visits (46). Consistent with a study in Kenya that reported ANC program modifications including limiting ANC hospital appointments and increasing networking between community health workers and communities (47). Participants in this study reported that they feel unsatisfied because they did not have sufficient time to discuss their pregnancies with healthcare providers during their ANC appointments. Participants in another study reported that if they stated dissatisfaction with ANC services due to changes caused by the pandemic, they had their ANC appointments and pregnancy classes cancelled or suspended (48). One study found that pregnant women were not examined in detail during ANC appointments, and that this may have led to health professionals missing important aspects in their pregnancy (44). Participants in the same study also used social media or written documents to obtain information from their healthcare providers during the pandemic. Pregnant women in another study declared social media a useful tool in providing antenatal care and support during the pandemic, particularly with regard to obtaining pregnancy-related information, managing feelings of isolation, service specific issues, and routine care (49). The

use of social media is an interesting way to communicate and deliver health promotion to pregnant women, as identified in this study.

In another study, good preventive behavior among pregnant women was found to be significantly associated with fear of transmission and good knowledge of COVID-19 preventive behaviors (50). Participants in this study understand that pregnant women are a vulnerable group due to their lowered immune response, and they rigorously implemented preventive measures such as wearing masks, washing hands with water and soap, and observing physical distancing, even while attending ANC appointments in the PHC. Such careful adherence to COVID-19 preventive behaviors may be due to the government's massive publicity campaign.

Strengths and limitations

A strength of this study is that it used open-ended questions which provided rich data for qualitative analysis. Its findings are still relevant to improving maternal health services. Despite its strengths, this study also has limitations. Its principal limitation is that the findings are of limited generalizability since all participants were married women of Javanese ethnicity who attended ANC appointments during the pandemic. Further research is required to examine the utility of social media as way of communicating between healthcare providers and pregnant women.

Conclusions

This study highlights the substantial impact COVID-19 had on ANC in rural areas of Indonesia. Its findings contribute to the growing body of evidence outlining the challenges faced in providing ANC in rural areas during pandemics. Pregnant women faced several difficulties in seeking antenatal care, reaching antenatal care facilities, and receiving satisfactory services at the health care facilities during the COVID-19 pandemic.

Declaration

-Ethical approval and consent: All methods were carried out in accordance with relevant guidelines and regulations. All procedures were approved by the Institutional Review Board, Faculty of Medicine, Universitas Jenderal Soedirman. Informed consent was obtained from all subjects and/or their legal guardian(s).

-Consent to publish: Not applicable.

-Availability of data and material: The datasets generated during and/or analyzed during the study are available from the corresponding author on reasonable request.

-Conflict of interest: There is no conflict of interest to declare.

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-Authors' contributions: MDA conceptualized and designed the study and wrote and revised the final manuscript. RS analyzed the data and critically reviewed and revised the manuscript. ET designed the study, analyzed the data, and critically reviewed and revised the manuscript. AI contributed to data collection, assisted with data analysis, and critically reviewed and revised the manuscript. DN analyzed the data and critically reviewed and revised the manuscript. AF contributed to data collection, critically reviewed, and revised the manuscript.

-Author's information: MDA is a female Doctor of Nursing Science with research interests in maternal care and women health. She has experience of carrying out qualitative studies and has taken some qualitative study trainings. RS is a female Master of Nursing Science with research interests in primary healthcare services, community, and family health. She has experience of carrying out qualitative studies and has taken some qualitative study trainings. ET is a male Doctor of Nursing Science with research interests in community and family health. He has experience of carrying out qualitative studies and has taken some qualitative study trainings. AI is a male Master of Nursing Science with research interests in community health nursing care. DN is a female Doctor of Nursing Science with research interests in maternal and childcare. AF is a male Doctor of Chemistry with research interests in bioanalysis for medical applications.

Table 3 Participants demographic data

Participant	Age	Parity	Education level	Occupation
P1	36	Multiparous	Senior High School	Housewife
P2	29	Multiparous	Bachelor's degree	Private employee
P3	36	Primiparous	Senior High School	Housewife
P4	31	Multiparous	Bachelor's degree	Government employee
P5	41	Multiparous	Elementary School	Housewife
P6	28	Primiparous	Senior High School	Housewife
P7	27	Primiparous	Bachelor's degree	Government employee
P8	39	Multiparous	Senior High School	Private employee
P9	24	Primiparous	Senior High School	Housewife
P10	32	Multiparous	Elementary School	Housewife

P11	22	Primiparous	Bachelor's degree	Private employee
P12	40	Multiparous	Junior High School	Seller
P13	19	Primiparous	Senior High School	Housewife
P14	30	Multiparous	Junior High School	Housewife
P15	36	Multiparous	Bachelor's degree	Private employee
P16	23	Primiparous	Senior High School	Private employee
P17	39	Multiparous	Junior High School	Housewife
P18	34	Multiparous	Junior High School	Housewife
P19	37	Multiparous	Junior High School	Housewife
P20	40	Multiparous	Senior High School	Private employee
P21	27	Primiparous	Senior High School	Housewife
P22	38	Multiparous	Bachelor's degree	Teacher
P23	29	Multiparous	Junior High School	Housewife
P24	31	Multiparous	Senior High School	Housewife
P25	43	Multiparous	Elementary School	Housewife
Participant	**Age**	**Gender**	**Education**	**Occupation**
P26	34	Female	Bachelor of Nursing	Nurse
P27	52	Male	Bachelor of Public Health Science	Head of PHC
P28	45	Female	Medical Doctor	Doctor
P29	38	Female	Diploma of Midwifery	Midwife
P30	39	Female	Diploma of Midwifery	Midwife
P31	43	Female	Diploma of Midwifery	Midwife

552

553

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RS
[Quoted text hidden]

Mekar Dwi Anggraeni <mekar.anggraeni@unsoed.ac.id> Mon, Feb 27, 2023 at 6:55 PM
To: BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com>

Dear Dr. David Mukunya
Editor of BMC Pregnancy and Childbirth,

We have revise the manuscript based on the reviewer's suggestions.
We have sumbit the revised manuscript to the journal's website.
Thank you for your attention.

Best regards,
Mekar Dwi Anggraeni
[Quoted text hidden]

Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com> Tue, Feb 28, 2023 at 5:42 PM
Reply-To: Tanay Rao <bmcpregnancyandchildbirth@biomedcentral.com>
To: mekar.anggraeni@unsoed.ac.id

Dear Prof. Anggraeni,

Thank you for your response.

Sincerely,
Tanay Rao
Editorial Support at BMC

> On Mon, 27 Feb at 11:56 AM , Mekar.anggraeni <mekar.anggraeni@unsoed.ac.id> wrote:
> **[External - Use Caution]**
> [Quoted text hidden]

BMC Pregnancy and Childbirth: Decision on your manuscript

1 message

BMC Pregnancy and Childbirth <bmcpregnancyandchildbirth@biomedcentral.com> Fri, Mar 3, 2023 at 1:44 PM
To: mekar.anggraeni@unsoed.ac.id

Ref: Submission ID 90026e5c-f55e-441c-927b-f3a7ae8d074a

Dear Dr Anggraeni,

Re: "Exploring the Antenatal Care Challenges faced during the COVID-19 Pandemic in Rural Areas of Indonesia: A Qualitative Study"

We're delighted to let you know that your manuscript has been accepted for publication in BMC Pregnancy and Childbirth.

Editor comments
The authors have addressed the comments given to them.

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