Original Article

Mothers' and Midwives' Experiences of Maternal and Child Health Services during the COVID-19 Pandemic in Banggai, Indonesia: A Qualitative Study

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Abstract

Background: Maternal and child health (MCH) services have been affected by the Coronavirus disease (COVID-19) pandemic in all countries, including Indonesia. Information regarding the impact of COVID-19 on MCH service access and provision is limited, particularly in the context of rural Indonesian communities. This study aimed to explore the experiences of Indonesian mothers and midwives from a rural regency regarding MCH services delivery during the pandemic.

Methods: This study was a sub-study of a pre-existing cohort study conducted in four sub-districts in Banggai, Indonesia, as the qualitative research. This study was conducted from November 2020 to April 2021, involving 21 mothers and six midwives. We selected the participants using snowball sampling. In-depth interviews were conducted in Bahasa. The study used both deductive and inductive approaches for analysis. Data analysis was performed using NVivo v.12.

Results: The study identified three themes and eight sub-themes from the analysis incorporating the midwives' and mothers' data. The themes included health service change, perceived barriers to service delivery, and family impact. This study highlights health service changes due to the pandemic, such as relocating the MCH services. Mothers perceived barriers to accessing health services, including distance reasons and fear of COVID-19. Only the shortages of staff affected the midwives in providing optimal services.

Conclusion: The pandemic triggered health service changes and caused some barriers to service delivery. This study recommends that the local government and stakeholders should pay more attention to the health service changes according to the mothers' experiences and address barriers to optimize access to MCH services during the pandemic.

Keywords: Prenatal care, Postnatal care, Midwifery, COVID-19, Community health services

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Introduction

The Coronavirus disease (COVID-19) pandemic has affected more than 600 million people and has caused more than six million deaths worldwide.[1] The rapid spread of COVID-19 has created logistic challenges and caused the healthcare system to become overloaded, especially in low-middle-income countries (LMICs). The most affected aspect in healthcare was the resources, such as medical experts, field officers, financial resources, and infrastructure, which reached their operational limit.[2, 3] However, every country has a different capacity and priority in responding to COVID-19, causing adequate healthcare provisions to be challenging.

Pregnant women are at particular risk of COVID-19. The global data show that COVID-19 has increased the risk of adverse pregnancy complications and outcomes, including pre-eclampsia, preterm births, and stillbirths.[4-9] Regular antenatal care is critical to prevent adverse pregnancy outcomes.[10-12] Before the pandemic, some existing factors, such as affordability,[13] geographical distance,[14] issues about service quality,[15] and other socioeconomic aspects[16] might affect access to health services. With the presence of the COVID-19 pandemic, the readiness of health services and facilities in LMICs to provide appropriate antenatal and postnatal care has been affected.[2, 8, 17, 18] One study described that the pandemic had jeopardised the government's capacity to provide essential health services for maternal and child health (MCH), which was a pre-existing problem before the pandemic.[19]

In Indonesia, the Ministry of Health reported that maternal mortality significantly increased during the pandemic, from 4,221 in 2019 and 4,627 in 2020 to 7,389 in 2021.[20] Several governmental and privately-owned health facilities are involved in the provision of MCH services, ranging from hospitals to integrated health posts (Posyandu). The latter is at the frontline, providing a monthly MCH service routine at the neighbourhood level.[21, 22] More specifically, Posyandu is designed to perform growth monitoring and immunisation for children and hold nutrition counselling and pregnancy classes for pregnant women. Maternity and newborn cares are often provided in Community Health Centre (Puskesmas).[23] Midwives are the key player in running these health facilities.[21] Understanding the challenges with which midwives are faced when delivering MCH services during the pandemic might be necessary to help the government design strategy to cope with and mitigate the impact of the COVID-19 pandemic on MCH services implementation.

It has been reported that Indonesian midwives have experienced challenges in providing MCH services during the pandemic, and such substantial changes are needed.[24, 25] However, there is a lack of data regarding whether these changes result in better outcomes for mothers and children. Exploring the experience of the mothers as the users to match the health care changes and needs in the community is needed to understand the positive changes that should be reinforced and the negatives to be addressed.

In our existing cohort study in Banggai Regency, Indonesia, we found that one in three participants had fewer than four antenatal care visits as recommended, and fewer mothers admitted that their children had missed anthropometric measurements. There are not sufficient data whether these problems were associated with the presence of the COVID-19 pandemic. To answer these gaps, a qualitative study is needed because the method can help to understand more profound personal experiences and perspectives. The aim of this study, therefore, was to explore the mothers' experiences and perceptions of accessing and utilising MCH services during the pandemic, incorporating the midwives' experiences in providing these health services.

Materials and Methods

In February 2020, we commenced a

population-based cohort study in the Banggai Regency in Central Sulawesi Province of Indonesia, with the aim of evaluating the impact of nutrition and microbiome on infant growth at six months in this population. This is a sub-study of our pre-existing cohort.

The design of the present study was a qualitative descriptive one using an in-depth interview. The study was designed to describe the participants' experiences and perceptions about the topic under investigation.[26] This study was conducted in four sub-districts, representing the regency city centre (Luwuk), two sub-districts closer to the regency city (North Luwuk and South Luwuk), and one sub-district some distance from the regency city (Nambo). The data were collected from November 2020 to April 2021. The report of this study is based on the Standards for Reporting Qualitative Research Checklist.[27]

Twenty one mothers participated in this study, recruited from our pre-existing cohort study. The inclusion criteria for the cohort study were: 1) 28-36 weeks of gestation, 2) 18-49 years of age, and 3) willingness to stay in Banggai for the next six months postpartum. We also interviewed six midwives who: 1) had been working in selected settings during the pandemic and 2) had experience in providing services for mothers and children in the cohort. The exclusion criteria were unwillingness to participate in the study after the study objectives were explained. In order to ensure geographic representation for the sub-study, we divided our cohort participants into sub-districts. Then, we used a random number generator to identify the first participant to be approached for an interview. We used snowball sampling to help identify other potential participants. This sampling method can be a useful way to recruit people who might otherwise be difficult to identify. Our study was conducted during the COVID-19 crisis when meeting people face to face was constrained. Using the snowball sampling method, we identified the first participant for an interview from the cohort study who expressed willingness to participate in further studies. After the first interview, we asked the interviewed mothers to advise another participant within their neighborhood whom she knew participated in our pre-existing cohort study and would be happy to be visited by study researchers at their house. Midwives were selected in each sub-district based on the inclusion criteria. We aimed to interview 24 participants from 4 sub-districts (5 mothers and one midwife in each subdistrict) and eventually ended up interviewing 27 participants. After the interviews, we transcribed and performed interactive coding for initial data analysis. We stopped the recruitment and interview when the answers eventually reached saturation or no new information was revealed during this process.

A semi-structured interview guide was developed by the research team. A multidisciplinary team reviewed the draft guide. After receiving feedback from the expert team, we revised the draft guide, and the final version was then translated into Bahasa Indonesia. It was also piloted with a pregnant woman and a midwife who was not enrolled in the cohort to evaluate the understandability of the guide. We commenced the interview by asking the condition of the participants and their family to establish comfortable interactions before the interview process. We also provided and used probe questions to allow collection of in-depth information from the participant's responses. If the participant was not sure about the questions, we repeated the question in a different way, so that she would understand. Because we already had good communication through our cohort study, we did not have incentive questions. The final interview guide with the probes questions included two topic areas: 1) experiences of accessing and providing MCH services during the pandemic which included exploration of the impact of the pandemic on families and accessing care and 2) perceptions about COVID-19, including the impact of COVID-19 on their lives.

In our pre-existing cohort study, we

explained the potential of collecting additional information for the mothers, and they agreed to be visited anytime. Therefore, the first contact with participants in the present study was made by visiting the mother's homes or the Community Health Centre (Puskesmas) where the midwives work. In the beginning, we explained the study objectives. After obtaining their consent to participate in this sub-study, we arranged the time of the interview at the participant's convenience. We also got permission to record the interviews. We conducted interviews as much as possible at a time when the participants were not with others. This was to maintain the confidentiality of the participants' information and ensure there was no response contamination from other people. The trained interviewers conducted the interviews for about 30-45 minutes in Bahasa Indonesia (the Indonesian national language) combined with the local language/dialect, as some participants preferred using the local language.

The interviewers (AT and research assistants) were from a health science background. They had experienced being involved in qualitative study interviews. In addition, we also held a one-day workshop to help the interviewers become familiar with the interview guides. All interviews were recorded using a digital voice recorder. The data processing was performed using formal Bahasa, Indonesia, to avoid misconceptions when being translated into English for data analysis. Each participant was given AU$ 3 mobile credits to compensate for their time after completion of interviews.

We employed deductive and inductive approaches in analysing the data,[28] adopting Braun and Clarke's thematic analysis method.[29] First, we performed transcribed verbatim of all interview recordings. All local dialect texts were translated into Bahasa Indonesia. This process was performed by one researcher (AT) and double-checked by research assistants who understood the local dialect to ensure the accuracy of the translation. All transcripts were then translated into English. After several readings of transcripts, we sorted the data into relevant topical categories using research aims and interview guide as the lenses. Next, we generated the codes and reviewed the correlation between the codes to identify sub-themes and themes. These emerged sub-themes, and the themes were then defined, considered, and retitled through in-depth discussion with three researchers, AT, ML, and AG met regularly until final themes and sub-themes were reached as the study findings. We reached 313 codes sorted into 30 sub-sub-themes and 8 subthemes to form three themes. All data analysis steps were performed using NVivo® v.12.

The trustworthiness of the study was conducted using credibility, dependability, confirmability, and transferability.[30, 31] Credibility was achieved by piloting the interview guide and protocol. The interviewers also had a good engagement in the study site. We prepared detailed drafts of the study protocol to assure dependability. To ensure confirmability, we used the investigator's field notes as a form of triangulation and discussion with the head of the health office to validate the data collected.

Ethical approval was obtained from the Ethics Committee for Medical Research of the Public Health Faculty, Universitas Hasanuddin, Makassar, Indonesia (approval number: 7199/UN4.14.1/TP.02.02/2020). All the participants were free to withdraw from the study at any time they wished without any change in their health care process. We assured the participants' confidentiality, including omitting their identity from the transcript and audio records.

Results

A total of 27 participants were included in this study. Table 1 shows the demographic characteristics of the mothers and midwives. Twenty-one mothers with an age range of 21-43 years were interviewed. Only 23.8% had graduated from college/university. Meanwhile, the midwives' range of age and clinical

Table 1: The study participants' demographic data

Participant	Roles	Age (years)	Gestational ages (weeks)	Education	ANC[a] visits less than WHO[b] recommendation (4 visits)	Number of children	Ethnicity	Subdistricts
P.1	Mother	21	40.1	High school	Yes	1	Saluan-Balantak-Banggai	South Luwuk
P.2	Mother	21	39.7	High school	No	2	Bajo	Luwuk
P.3	Mother	35	41.4	Middle school	Yes	4	Java	North Luwuk
P.4	Mother	39	38.9	Bachelor's degree	Yes	1	Saluan-Balantak-Banggai	South Luwuk
P.5	Mother	30	40.2	Primary school	Yes	1	Gorontalo	North Luwuk
P.6	Mother	29	40.0	Primary school	Yes	3	Bugis-Makassar	North Luwuk
P.7	Mother	27	40.8	Bachelor's degree	No	3	Java	Luwuk
P.8	Mother	30	40.1	High school	No	2	Saluan-Balantak-Banggai	South Luwuk
P.9	Mother	37	39.8	Primary school	No	3	Gorontalo	Luwuk
P.10	Mother	29	38.7	Primary school	No	1	Gorontalo	South Luwuk
P.11	Mother	26	40.7	High school	Yes	1	Saluan-Balantak-Banggai	Luwuk
P.12	Mother	32	40.1	Primary school	Yes	1	Saluan-Balantak-Banggai	Luwuk
P.13	Mother	28	41.4	Primary school	Yes	3	Saluan-Balantak-Banggai	North Luwuk
P.14	Mother	30	39.8	Bachelor's degree	Yes	1	Bali	North Luwuk
P.15	Mother	41	37.1	High school	No	2	Saluan-Balantak-Banggai	South Luwuk
P.16	Mother	27	36.1	Diploma certificate	No	2	Saluan-Balantak-Banggai	South Luwuk
P.17	Mother	39	40.5	Primary school	Yes	2	Bugis-Makassar	Nambo
P.18	Mother	25	40.2	High school	No	1	Bugis-Makassar	Luwuk
P.19	Mother	43	38.6	Diploma certificate	Yes	1	Java	Nambo
P.20	Mother	24	41.2	High school	No	1	Bugis-Makassar	Nambo
P.21	Mother	39	41	Middle school	No	2	Gorontalo	Luwuk

Participant	Roles	Age (years)	Working experience as a midwife (years)	Education	Number of children	Ethnicity	Subdistricts
P.22	Midwife	32	4	Diploma certificate	2	Gorontalo	Luwuk
P.23	Midwife	40	12	Diploma certificate	1	Bugis-Makassar	Luwuk
P.24	Midwife	42	15	Diploma certificate	1	Saluan-Balantak-Banggai	South Luwuk
P.25	Midwife	38	8	Diploma certificate	1	Bugis-Makassar	Nambo
P.26	Midwife	40	14	Diploma certificate	3	Kendari	South Luwuk
P.27	Midwife	45	18	Diploma certificate	4	Gorontalo	North Luwuk

[a]Antenatal care; [b]The World Health Organization

Table 2: Sub sub-themes, sub-themes, and themes which emerged from integrated mother-midwife experiences

Sub sub-themes	Sub-themes	Themes
Move to Puskesmas	Service relocation	Health service change
Antenatal and postnatal check was at home		
Services were given in the midwife's place		
Online pregnancy counselling		
Posyandu stopped	Reduced services	
Service hours shortened		
Uncertainty with the services provision		
Puskesmas staff did not come at home		
Wash hands and wear masks	Health service changes specific to COVID-19	
COVID-19 rapid tests before labour		
Additional cost for COVID-19 related services		
Health workers attitude		
Provide adequate information about the pandemic	Support within the health service for mothers affected by the pandemic	
Reduce misinformation about vaccine		
Monitor mothers who are contracted COVID-19		
Encourage mothers to access health service at health facilities		
Support the mothers who feel worried		
Health facilities were far away	Mother's perceived barriers for accessing service	Perceived Barriers to Service Delivery
Puskesmas operational hours were restricted		
Midwives were not able to meet them		
Prefer buying medicine rather than visiting health facilities		
Staff shortage in Puskesmas to run home visit programme	Midwives' perceived barriers for providing services	
Health facilities are overloaded		
Additional COVID-19 responsibilities		
Lack of clear communications with mothers about ANC[a] service changes during the pandemic		
No income affecting family life	Financial impact	Family impact
No insurance coverage		
Feel worried about getting COVID-19	Emotional impact	
Feel sad because not be able to meet family members		
Feel depressed		
Coping strategies with negative feelings		

[a]Antenatal care

experience was 32-45 years and 4-18 years, respectively. Five out of the six midwives were not from the area; some were living outside the village where they worked.

Three main themes were identified from the mothers' and midwives' data, including 1) health service change, 2) perceived barriers to service delivery, and 3) family impact. These themes consist of eight sub-themes (Table 2).

1. Health Service Change

It is found that the COVID-19 pandemic has altered general health service in Banggai, including care for pregnant women and children under five although the extent of the impact is not known yet. In this theme, 4 sub-themes emerged as follows.

1.a. Service Relocation

The analysis of mothers' experiences revealed that the sites for the routine MCH service delivery had been relocated from the Posyandu at the hamlet level to the Puskesmas at the sub-district level. In addition, a home visit programme to extend the service coverage in the community was also initiated in some areas, especially in regency city (Luwuk). Two participants said:

"I checked my pregnancy at kilo 8 Posyandu several times. But now, the Posyandu was not there, the midwife asked us to the Puskesmas. So, I went to the Puskesmas. I met the midwife I usually meet in the Posyandu." (P.1)

"Yes, now we focus on reaching out the mother at their home." (P.26)

The mothers, who lived in a sub-district far from the regency city, had to take their children to the cadres' houses or the village health post (Poskesdes) to obtain health services. One participant stated:

"[During the pandemic] I took my child to the cadre's house every month to have him weighed. Pak Mantri [vaccination staff] came to that place, too. But we could not come late because the midwife had made a specific time for everyone. [...] If late, we needed to be rescheduled." (P.20)

Providing maternity care during the pandemic was challenging for midwives. However, they were also aware that the services should remain to delivery to the community. Therefore, some midwives anticipated this pandemic situation by changing the delivery methods. For example, one midwife utilised mobile apps (e.g., WhatsApp and Facebook) to provide nutrition counselling for the mothers. This midwife claimed that using social media was effective and safe to keep providing service for the mothers. A midwife said:

"[...] I told them that we all had WhatsApp. So, I gave the counselling through the group [WhatsApp group]. I have a group for pregnant women and women with babies. One mother can ask questions, and all mothers can read [the answers]. It is safe and effective, and we don't have to meet in person. Visiting their home would be time-consuming." (P.24)

1.b. Reduced Services

During the Posyandu, services such as reproductive health and nutrition counselling, anthropometric measurements and growth monitoring, immunisation, and nutrition supplementation were provided. However, since the pandemic, some services were apparently affected and inaccessible. A few mothers reported that they did not get multi-micronutrient supplements although they came to the Puskesmas. The midwives claimed it was because the supply of multi-micronutrient supplements in the pharmacy warehouse was limited. Two participants mentioned:

"In the last few months of my pregnancy, I did not get the Angel [multi-micronutrient supplement] anymore. The Posyandu was cancelled at that time. I came to the Puskesmas, but the midwife said there was no more stock." (P.14)

"It is difficult now to ask the pharmacy warehouse for a new supply. I have heard that the supply is very limited, and most of the supplements will expire soon." (P.22)

The mothers also experienced that home visit programme was suboptimal in terms of the service coverage. They thought more effort

is needed to get a "complete" service that they usually get from Posyandu. Regardless of the services they received during the home visit, they still need to come to the Puskesmas to get vaccination for their children. It was because the vaccination staff did not come. Similarly, another participant also reported uncertainty about the services provision; she did not get nutrition counselling from the midwife at the time of visit. Two mothers implied:

"The midwife said that the vaccination officer would come, but he never came. So, I need to take him to Puskesmas." (P.6)

"In the past [during the Posyandu], I got used to talking to the midwife about my child's health. I thought maybe because she had to visit from houses to houses, so she had no time." (P.15)

The health service change was also represented by the shortened service hours of the Puskesmas, which then affected the mothers' accessibility to the services. As two participants said:

"We shortened the service duration in this Puskesmas. Previously we closed at 2 pm. It is 12 pm now." (P.22)

"I went there [the auxiliary Puskesmas] twice in the afternoon, but the Puskesmas was always closed. The registration counter was closed. It's not like what I thought. It seems they closed [the service] earlier because of this Corona. Next visit, I tried to go to another Puskesmas, but the service was only until midday." (P.10)

1.c. Health Service Changes Specific to COVID-19

One of the service changes specific to COVID-19 was shown in the maternity service to ensure the mothers gave birth in health facilities safely during the pandemic. Most mothers (n=9) shared that they had to undergo a rapid COVID-19 test a week before giving birth although the implementation did not always go according to the guidelines. Some mothers had the test a day before giving birth, which could cause stress for the mother if the result was positive. A mother said:

"So, I gave birth at Poskesdes, and the midwife helped me. At that time, I was asked to undergo a rapid test before the labour. Thanks God! The result was not reactive [negative]. The midwife then assisted in my delivery. She said if my result was reactive, I could have been referred to the hospital for my birth process, being isolated." (P.8)

1.d. Support Within the Health Service for Mothers Affected by the Pandemic

This study also obtained information about supports within the health service for mothers affected by COVID-19, especially those feeling worried and anxious during their pregnancy. The midwives' support was varied, but phone consultation was the most common. They said they were always ready to be contacted whenever people needed help. One midwife said:

"There was a pregnant woman who got infected, despite no symptoms. This mother tested positive for Corona before delivery. So, she had to be quarantined in the hospital. After going home, she had to stay at home for 14 days for quarantine. That's the policy. She got depressed at that time, so I gave her counselling and always checked her condition so that she felt calm and comfortable. That's all I could do" (P.22)

2. Perceived Barriers to Service Delivery

This theme identified the issues that were more related to perception than operational or infrastructure aspects. We identified two sub-themes as follows:

2.a. Mothers' Perceived Barriers for Accessing Service

Some factors hindered the mothers from getting the services in health facilities, such as the distance of health services facilities, absence of other family members who can take the mother to Puskesmas, the service hours being cut short, or the absence of midwives in the Poskesdes. A mother implied:

"Because during this Corona the immunisation and [weight] measurement

service was not there [Posyandu] anymore. [...], I had to take my child to the Puskesmas for immunisation. But I did not go there, so I don't know his weight. The place is far away." (P.14)

2.b. Midwives' Perceived Barriers for Providing Service

The health service change caused difficulty in accessing services. Additionally, the absence of health workers through the home visit programme also affected the adequacy of health services received.

Midwives also perceived barriers to providing health services during the pandemic, including staffing shortage in Puskesmas, overloaded health facilities, and additional COVID-19-related tasks. The midwives reported that the health facilities were understaffed, which also caused difficulties in running and sustaining a home visit programme.

"I think a home visit [service] is very good, but it requires more people to cover our targets [mothers and children] because we must visit them. Sometimes I could not do that because I also have another responsibility in Puskesmas. I also was involved in the COVID-19 teamworking." (P.26)

Another factor that could prevent the midwives from delivering adequate care for the mothers was the preparedness of health facilities, especially for exceptional circumstances, such as delivering the babies of infected pregnant women. The COVID-19 disaster worsened, and the health facilities seemed to be overloaded. One midwife stated:

"I often find it difficult to handle pregnant women with emergency [infected patient]. I don't know where to go. I decided to refer her to other regencies' hospitals." (P.23)

3. Family Impact

This theme presents information regarding the impact of the pandemic on the participants' lives, mothers and midwives. This theme has two sub-themes as follows:

3.a. Financial Impact

The COVID-19 pandemic has exacerbated socioeconomic condition of the participants although none of the midwives reported so. More than half of the mothers (n=13) said how they or their family heads quit work or were forcibly laid off from their job due to the pandemic. This situation affected the ability and affordability of their basic needs and the ability of participants and their families to meet them, including the need for access to health services. Two mothers said:

"Now, we are struggling because there is no income at all. [...] I once went there [Puskesmas] when I was pregnant. Maybe about 1-2 km on walking. In there, I checked my pregnancy and paid around Rp25,000. So, I only came once because it was better to buy food than to pay for the Puskesmas. [...] I was not strong enough to walk for 2 km away." (P.19)

"I couldn't take my son to the Puskesmas every month because I was afraid of paying something while I had no money. My husband does not have it [job], right? I only went there [Puskesmas] to bring my son for immunisation." (P.13)

3.b. Emotional Impact

We also found that the participants' feeling of both mothers and midwives was affected due to COVID-19 pandemic. The feelings expressed were varied, including feeling anxious about the lockdowns and travel restrictions, being worried about giving birth in the hospital or being worried about their family as implied by the mother and the midwife:

"When I was about to give birth, I felt so worried to go to the hospital. I was afraid that I might get COVID because we can get COVID in the hospital." (P.12)

"I'm just worried about my baby and family. I am still giving the services for the mothers, but I cut the duration. I mean I don't accept any patients after hours." (P.24)

Discussion

The purpose of this study was to explore

the mothers' experiences and perceptions of accessing MCH services during the pandemic, incorporating the midwives' experiences in providing these health services. The result identified three themes of health service change, perceived barriers to service delivery, and family impact.

The theme health service change is related to the modifications made in MCH services due to the pandemic. The present study revealed that mothers experienced the relocation of the Posyandu services to Puskesmas and home visits, as mentioned by the midwives. This relocation might be necessary to relax the crowd gatherings. However, the mothers perceived that the changes affected the services because several service components, such as immunisation, supplementation program, and counselling, were often undelivered. Additionally, mothers indicated reduced services during the pandemic. For example, the service hours in Puskesmas were cut short. This finding is similar to a study in Kenya that found that the COVID-19 pandemic further exacerbated access to and quality of health services.[17] Similarly, changes in MCH due to COVID-19 were also experienced by developed countries such as Australia.[32] However, despite the negative effects of COVID-19 on changes in the health system, the Australian government had the capacity to provide support and then result in a greater impact on the community, including an increase in the use of telehealth consultation, providing access to affordable treatments and vaccines for people living in the regional, and maintaining continuity of care.[32, 33] Meanwhile, in this rural community of the present study, infrastructure for telemedicine and health resources was limited, generating some barriers to accessing health services.

The provision of a home visit is to accelerate service delivery coverage. However, the present study reported that the home visit program was not well implemented as some services, especially immunisation, were not provided. A few midwives even confirmed that they needed to terminate the home visit program as the number of COVID-19 cases rose. This situation could exacerbate health service delivery for mothers and their children. A study showed the benefits of home care services in increasing maternal care coverage and health outcomes, despite the existing challenges.[34] Similar to this finding, a study in Indonesia reported that home visits, often conducted to screen women with high-risk pregnancies or complications, were cancelled due to the pandemic.[35] In contrast, a study in Ireland reported the continuity of home visit service for maternity care during the pandemic. This different result is probably influenced by the government policies regarding the COVID-19 situation. For example, in Banggai, the preparedness of the health system to conduct home visits was insufficient due to staff shortage and inadequate personal protection. The study in Ireland combined home visits with telemedicine; therefore, the time to visit home could be reduced. The government of Banggai should rethink the continuity of service delivery and make it a priority. For example, using an online platform (e.g., WhatsApp if not telemedicine) to spread health and nutrition information or to monitor the condition of pregnant women and infants might be beneficial, as one midwife did.

The theme perceived barriers to service delivery identified that most barriers hindered the participants' access to particular MCH services during the pandemic was related to the health service changes. For example, some mothers felt that the Puskesmas were further away than the village service (Posyandu), and it required travel costs. The others feared higher infection exposure and unfamiliarity with the COVID-19 situation in Puskesmas. These compounding factors lead to a perception that the Puskesmas is far away. Hence, they did not want to go there. Similarly, some studies found that pregnant mothers were reluctant to seek health care due to the fear of contracting infections;[36, 37] this study added that the fear of COVID-19 also affected the health services utilisation by

family members of the mothers.

Furthermore, the midwives also perceived fears about family safety and well-being. These feelings affected their routines in providing services, such that they no longer provided services at their place of residence (e.g., their own house or the Poskesdes) after working hours. Before the pandemic, midwives provided services whenever the mothers and the community needed them. Some studies reported similar findings that worry about family safety was the key issue in maintaining appropriate health services for mothers and their infants.[25, 38-40] Different from the present study, a previous study in Indonesia reported that some midwives still supported the mothers after hours, indicating their commitment to and responsibility for their jobs.[25] It might be related to the working experiences of the midwives in this study location, which is more than 11 years. The midwives might already have good relationships with the people; therefore, they still want to provide service for them.

We also revealed the indirect barriers that probably disrupted access of the mothers and their children to appropriate health services, such as the cost of transportation, lack of family support, insufficient insurance coverage, and absence of health workers at service locations. The latter was cross-confirmed by the midwives who reported that during COVID-19 health facilities experienced staffing shortages. These results are consistent with those of a study that maternal and newborn health facilities were overshadowed by staffing shortages issues.[40] However, the previous study did not report why the health facilities were understaffed. This study added the information that the health workers, including midwives and vaccination staff, had COVID task responsibilities, thus increasing their workload.

Under the theme family impact, we include factors that potentially disturb access to health care. Some mothers mentioned that they experienced financial difficulties because they and/or their husbands were laid off or forced to quit their jobs. Economic insecurity can lead to broader effects, such as limited purchasing power for food and access to adequate health services, especially for those living in developing areas, where access to those necessities was difficult to address even before the pandemic. A mother reported that she once had to choose between using the money for transportation to Puskesmas or food. This finding was different from a study in Kenya which found that mothers were still able to look for help, despite experiencing financial difficulties.[41] These different findings were affected by the fact that more affordable services (e.g., traditional midwives or birth attendants) still exist in Kenya, while such support was no longer available in this study population. Thus, the government should be present to provide an incentive and ensure that people can still access their basic needs so that further effects of COVID-19 on mothers, children, and families can be avoided.

A key strength of the present study includes the in-depth analysis of participants representing the perspectives of both healthcare providers and users. Participants were from diverse locations, Regency's capital subdistrict (Luwuk), sub-districts near the Regency's capital (South and North Luwuk), and the sub-district far from the Regency's capital (Nambo). During the cohort study data collection, we established a good existing engagement with the local people, midwives, and the local government leaders (Bupati). In addition, we had trained local research assistants who helped communicate with people using the local language and were also involved in ensuring the translation accuracy of the interview data.

Some limitations of this study should be considered. We selected the participants using snowball sampling, but through this method the participants' experiences may not represent the whole population in this area. However, we selected the participants from different sub-districts location (within, near, and far from the Regency's capital) to increase the generalizability of the study.

Conclusion

The COVID-19 pandemic in Indonesia triggered health service changes and caused some barriers to service delivery according to the mothers' and midwives' viewpoints. Service relocation (distance reasons) and fear of COVID-19 are the main barriers the mothers perceived, which could negatively affect their access to health services. Both midwives and mothers perceived staff shortages as a barrier to MCH service delivery. Additionally, the COVID-19 pandemic triggered financial difficulties, which can potentially affect health-seeking decisions.

We recommend that the local government and stakeholders should pay more attention to the health services changes according to the mothers' needs and address structural and perceived barriers to service delivery, for example resuming the Posyandu as soon as the pandemic restriction is relaxed and providing adequate PPE to mothers to deal with the main barriers to accessing health service. Furthermore, the attitude of the midwives, who strived continuously to provide MCH services to pregnant women, including those who contracted COVID-19, is a positive value that must be encouraged.

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