

# Individual Motivation for Completion of Antenatal Care Consultations In The Community Health Center: A Mixed Methods Study

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## Research article

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# Abstract

**Background:** Antenatal care is an intensive program for mother and child, predominantly received from healthcare professionals during pregnancy. Recent studies have shown a high rate of incomplete consultations, while several qualitative and quantitative assessments highlighted the influencing risks and motivational factors. These were performed in an attempt to gain a more comprehensive understanding hence data were collected and consequently evaluated on the basis of competition, using a convergent mixed-methods design.

**Methods:** The data were collected in Makassar, Indonesia, using a sequential explanatory designed that was initially conducted as a quantitative study in the form of a questionnaire for pregnant/reproductive women (n=326), followed by a focus group discussion (FGD), as a qualitative study targeted at people, which includes pregnant/reproductive women and health workers (n=60). To quantitatively evaluate the relationship between each factor and the completion of antenatal care consultations, odds ratios (ORs) were calculated using the logistic regression model. Similarly, in order to validate the results from the quantitative study and explore the real background in each motivation factor, qualitative analysis was conducted by FGD.

**Results:** In the qualitative analysis, the level of education of the husband and the time allocated to examination were linked with the completion status of antenatal care consultations. Particularly, the women that received accurate and prompt services were more likely to complete the antenatal care consultations [Adjusted OR for additional physical examination: 1.90 (95% CI: 1.03–3.48); and OR for additional obstetric physical examination: 9.10 (95% CI: 3.42–24.23)] compared to the women that did not receive. According to the FGD, the quality of health care centers was an important factor for the completion of antenatal care performance, and pregnant women frequently visited *Posyandu* which is a health post in the community instead of going to the community health center.

**Conclusions:** The main challenges for individual motivation to complete their consultations remain the socio-economic status, lack of knowledge on pregnancy experiences, and the quality of health care centers. These factors need to be considered in order to improve the health policy for adequate services for pregnant women.

## Background

Since the 1990's, several interventions by the Indonesian government have sought to reduce maternal and child mortality. The recommended efforts by all pregnant women to access health care consultations during pregnancy provide a high quality of community services [1]. As the intensity of the effort increases, the extent of the implementation of antenatal care shifted even further to the number of consultations that attain its goal [2], [3]. However, in reality, mother's mortality trends remain high till date, with about 359 deaths per 100,000 live births [4] and a large number occurs in the health care facilities [5].

Previous qualitative studies identified a number of factors that play a role in determining the sustainable support for women during pregnancy and postpartum care, such as technical and administrative challenges, experiences, socio-economic status, and the characteristics of the community [6], [7]. Furthermore, the time allocated before examinations, or poor accessibility by poor people to medical services [8], as well as access to health facilities and services [9] are key factors. Also, there are a number of similarities on qualitative research that examine the obstacles in accessing health services by pregnant women, which is influenced by the lack of available ultrasound machines, the allocated time, the presence of health staff, the availability of essential medical examinations equipment, and nurses behavior. Similarly, barrier's of access to maternal health services were also identified regarding different perspectives on the importance of screening tests and the limited antenatal care services [10]–[12].

These important factors for accessing antenatal care have been reported in previous qualitative and quantitative studies. However, in order to gain a more comprehensive and complete understanding, it is necessary to qualitatively and quantitatively assess these factors along with an evaluation of medical services guaranteed in the same program. These assessments may explore the real needs or demands of women during pregnancy and postpartum periods [8], [9] and may be adaptable for real local conditions.

Therefore, a convergent parallel mixed-methods design was adopted, in which qualitative and quantitative data were collected in parallel, analyzed separately, and then merged [13]. Also, the individuals' motivates model, in order to avoid negative consequences, which impacts motivations for healthy living [14]. Then, the description of a more complete understanding of motivation and obstruction for the completion of antenatal care consultations was carried out. The results help in the improvement of health policies for adequate services for pregnant women.

## Methods

### Study Design

In this study, a convergent parallel mixed-methods design was used, and it is a type in which qualitative and quantitative data are collected in parallel, analyzed separately, and then merged. Furthermore, the data collection was carried out from March 26th to June 2nd, 2018, using a sequential explanatory designed, which is initially aimed at conducting a quantitative study to obtain statistical results, and then examining the qualitative data to explain the quantitative results [13]. First, a questionnaire survey was first conducted in order to obtain the qualitative data. The full item questionnaire was presented in Supplementation File (Additional file 1). Second a focus group discussion (FGD) was conducted. COREQ: a 32-item Checklist was presented in Supplementation File (Additional file 2) and The Focus Group Discussion Guidelines was presented in Supplementation File (Additional file 3). The data are used to examine the factors that influence the motivation for the completion of antenatal care for pregnant women in the environment. The data from the focus group discussion validated the results from the quantitative study and explore the real problem and individual background for each factor which is

positively or negatively related to the motivation for the completion of antenatal care with an open question.

Initially, pregnant women were observed at 4 (four) community health centers in Makassar in order to access their characteristics, health-care needs, and the available services. Secondly, the resources identified already understand the local conditions and the needs of the community. The necessary aspects and functions of health-care that were identified and raised during these stages were then developed into a model using the method of the focus group discussion (FGD). Furthermore, the approaches were used to strengthen and to understand the problem of the research better by converging both quantitative and qualitative to advocate for change in the target group.

## Study area

The study area, Makassar is the largest city on the island of Sulawesi in the archipelago Indonesian and has 15 (fifteen) sub-districts. According to official central government statistics, it has a total population of 1,469,601 people. Furthermore, the economic structure comes mainly from the industrial sector; the growth rate of the gross domestic regional product is more than 7.99 higher than the national level, and more than 98.86% of the population between the age of > 15 are literate[15].

An overview of the health profiles is provided according to mortality includes neonatal, infant, and maternal, morbidity includes malaria, dengue fever, acute flaccid paralysis, and HIV AIDS, and low birth weight for nutrition status. All of these health indicators are better than the indicators at the national level. For example, in Makassar, the neonatal mortality rate was 1.44 per 1000 live birth, the infant mortality rate was 3.40 per 1000 live births, the maternal mortality rate was 2.58 per 100,000 live births, and mobility (malaria, dengue fever, acute flaccid paralysis, HIV AIDS and low birth weight) was 23.42 per 100,000 live birth [15].

## Study subjects

For the questionnaire survey, pregnant women and the reproductive age women with at least 2 (two) years of birth with targeted random samples were given as the schedule for the qualitative data collection. A woman that is pregnant for the first time (*primigravida*) and the women identified with pregnancy complications with other diseases were excluded. Finally, a total of 326 respondents were successfully recruited into the target group from 4 (four) community health centers. The samples represent more than 10% of pregnant women in each community health center, with about 800–1000 pregnant women that were registered during the period.

For the focus group discussion, the resource group consists of people that work as a source of information for the target group. 15 (fifteen) participants were assigned at each community health center, which includes 4 (four) pregnant women, 2 (two) maternity and pediatric staffs that provide health-care services (midwives), 1 (one) head of community health center, 2 (two) public health officers (e.g., community health development) from the Makassar municipality, 2 (two) cross-sector health officers, 4

(four) community working groups or cadres. Pregnant women were also assigned to focus groups on the questionnaire.

## **Measurement of motivation factors and completion of antenatal care visits**

A questionnaire for a quantitative study was developed based on the pregnant women and child health book (Indonesian cohort book) [16]. Demographic characteristics of pregnant women (age, parity, highest educational level of respondent and husband), accurate and prompt treatment actions (provided and received all kinds of treatments or not), and scope of antenatal care and postnatal care consultations were collected as motivation factors.

The number of antenatal care consultations was also obtained from the questionnaire. The completion of consultations was defined as 4 (four) or more, and the recommendations were adopted from a collaborative study between the Indonesia Ministry of Health and the World Health Organization.

## **Statistical Analyses**

In the first stage, in order to examine the factors that influence the motivation to carry out antenatal care, we quantitatively described demographic characteristics of study participants and the status of accessing health services by a questionnaire survey. Then, the odds ratio (OR) was calculated and its 95% confidence interval (CI) according to the logistic regression model. Furthermore, we adjusted for the potential confounders such as the age of the respondent, parity, and educational level of the respondent and their husband in multivariate analyzes. In this analysis, the demographic characteristics were classified into two groups: high and low-risk groups for delivery. For example, pregnant women whose age is  $< 20$  years of age or  $\geq 35$  years or in which the parity is more than or equal to 4 times parity, were classified as a high-risk group for delivery. The higher potential risks of characteristics for incomplete antenatal care visits were set as a reference group. The statistical analysis was performed using SPSS software (v.21; IBM SPSS, Armonk, NY, USA). A P-value  $< 0.05$  (two-sided test) was considered statistically significant.

In the second stage, qualitative analysis with a sequential statement was performed to formulate the explanatory results, to validate the results of the quantitative study and to examine the real context of each motivational factor. In this step, based on results from the quantitative study, the participants were interviewed in four focus groups, which consists of 15 participants in each focus group discussion at the health center with an open-ended question. Furthermore, after the discussion, some notes were organized, and then transformed into a well-organized set of notes.

## **Results**

### **Questioner survey**

The mean age of pregnant women that participated in the questionnaire survey was 27 years. The characteristics of the study participants for the questionnaire survey are shown in Table 1. A total of 151 participants completed their antenatal care consultations more than or equal to 4 times (46.3%) and 175 participants did not complete (53.7%). The percentage of participants that graduated from primary school was 60%, and the women that their husband graduated from primary school was 63 %. The higher percentage of participants that received an additional physical examination and vital signs at each consultation (82.2%) and received obstetric physician examination and vital signs at the first consultations (89.6%) were observed. In contrast, the percentage of participants that received an additional obstetric physical examination and vital signs at each consultation was low (11%). Regarding the postpartum consultations, most of the participants had received examination services 6–8 hours after delivery (before returning home) (96.9%), but 40.2 % and 27.6% of participants had not visited the primary care/health service after six days and after two weeks of delivery, respectively. More than a quarter of participants (27.6%) had not visited the primary care/health service after six weeks of delivery.

Table 1

The characteristics of study participants and association between each characteristic of pregnant women and completion of antenatal care visit for the questioner survey (n = 326)

Characteristics and type of examination	Total N (%)	Antenatal care visit N (%)		Crude OR (95% CI)	Adjusted OR* (95% CI)
		Complete (4 visits or more) N = 151	Incomplete (< 4 visits) N = 175		
<b>Demographic Characteristics</b>					
<b>Age groups</b>					
<20 or ≥ 35 yrs.	76 (23.3)	40 (52.6)	36 (47.4)	1.39 (0.83–2.33)	1.14 (0.65–1.98)
20–34 yrs.)	250 (76.7)	111 (44.4)	139 (55.6)	ref	ref
<b>Parity</b>					
≥ 4	50 (15.3)	30 (60)	20 (40)	1.92 (1.04–3.55)	1.73 (0.90–3.34)
≤ 3	276 (84.7)	121 (43.8)	155 (56.2)	ref	ref
<b>The highest educational level</b>					
Secondary	127 (39)	66 (52)	61 (48)	1.45 (0.93–2.27)	1.36 (0.86–2.15)
Primary	199 (61)	85 (42.7)	114 (57.3)	ref	ref
<b>The highest educational level of Husband</b>					
Secondary	118 (36.2)	73 (61.9)	45 (38.1)	2.70 (1.70–4.31)	3.02 (1.69–5.41)
Primary	208 (63.8)	78 (37.5)	130 (62.5)	ref	ref
<b>Accurate Actions</b>					
Did you get a physical examination and vital signs at the first consultation?					

OR, odd ratio; CI, confidence intervals

\* Adjusted for age, parity, and educational level of respondent.

Characteristics and type of examination	Total N (%)	Antenatal care visit N (%)		Crude OR (95% CI)	Adjusted OR* (95% CI)
		Complete (4 visits or more) N = 151	Incomplete (< 4 visits) N = 175		
Yes	145 (44.5)	44 (30.3)	101 (69.7)	0.30 (0.19–0.48)	0.31 (0.20–0.50)
No	181 (55.5)	107 (59.1)	74 (40.9)	ref	ref
Did you get an additional physical examination and vital signs at each consultation?					
Yes	268 (82.2)	132 (49.3)	136 (50.7)	1.99 (1.10–3.62)	1.90 (1.03–3.48)
No	58 (17.8)	19 (32.8)	39 (67.2)	ref	ref
Did you get an obstetric physical examination at the first consultation?					
Yes	292 (89.6)	138 (47.3)	154 (52.7)	1.45 (0.70–3.00)	1.28 (0.61–2.67)
No	34 (10.4)	13 (38.2)	21 (61.8)	ref	ref
Did you get an additional obstetric physical examination at each consultation?					
Yes	36 (11)	31 (86.1)	5 (13.9)	8.78 (3.32–23.24)	9.10 (3.42–24.23)
No	290 (89)	120 (41.4)	170 (58.6)	ref	ref
<b>Prompt Action</b>					
Did you go through the registration counter for consultation?					
Yes	249 (76.4)	122 (49)	127 (51)	1.59 (0.94–2.68)	1.64 (0.96–2.79)
No	77 (23.6)	29 (37.7)	48 (62.3)	ref	ref

OR, odd ratio; CI, confidence intervals

\* Adjusted for age, parity, and educational level of respondent.

Characteristics and type of examination	Total N (%)	Antenatal care visit N (%)		Crude OR (95% CI)	Adjusted OR* (95% CI)
		Complete (4 visits or more) N = 151	Incomplete (< 4 visits) N = 175		
Did you wait for examinations was quite a long time?					
No	162 (49.7)	85 (52.5)	77 (47.5)	1.64 (1.06–2.54)	1.54 (0.99–2.41)
Yes	164 (50.3)	66 (40.2)	98 (59.8)	ref	ref
<b>Postpartum visitation</b>					
Did you receive examination services 6–8 hours after delivery?					
Yes	316 (96.9)	146 (46.2)	170 (53.8)	0.86 (0.24–3.03)	0.88 (0.25–3.17)
No	10 (3.1)	5 (50)	5 (50)	ref	ref
Did you receive the primary care/health service after six (6) days of delivery?					
Yes	195 (59.8)	80 (41)	115 (59)	0.59 (0.38–0.92)	0.60 (0.38–0.95)
No	131 (40.2)	71 (54.2)	60 (45.8)	ref	ref
Did you receive the primary care/health service after two (2) weeks of delivery?					
Yes	203 (62.3)	74 (36.5)	129 (63.5)	0.34 (0.22–0.54)	0.34 (0.21–0.55)
No	123 (37.7)	77 (62.6)	46 (37.4)	ref	ref
Did you receive the primary care/health service after six (6) weeks of delivery?					
Yes	236 (72.4)	111 (47)	125 (53)	1.11 (0.68–1.81)	1.15 (0.70–1.89)

OR, odd ratio; CI, confidence intervals

\* Adjusted for age, parity, and educational level of respondent.

Characteristics and type of examination	Total N (%)	Antenatal care visit N (%)		Crude OR (95% CI)	Adjusted OR* (95% CI)
		Complete (4 visits or more) N = 151	Incomplete (< 4 visits) N = 175		
No	90 (27.6)	40 (44.4)	50 (55.6)	ref	ref
OR, odd ratio; CI, confidence intervals					
* Adjusted for age, parity, and educational level of respondent.					

The estimated relationship between each factor and the completion of antenatal care are also shown in Table 1. It was discovered that women that their characteristics were classified into higher risks for delivery are more likely to complete antenatal care consultations than women with lower risks of delivery. Particularly, women with high parity ( $\geq 4$  times) were more likely to complete antenatal care consultations [OR:1.92 (95% CI: 1.04–3.55)] compared to women with lower parity ( $\leq 3$  times). After adjusting for potential confounders, the relationship between parity and antenatal consultation completion was weakened, but the positive relationship was observed [adjusted OR: 1.73 (95% CI: 0.90–3.34)]. Regarding the educational level, women with higher educational levels (graduated secondary school or more) tend to have more extensive antenatal care consultations [OR: 1.45 (95% CI: 0.93–2.27)] compared to women with a lower educational level (graduated primary school or less). In addition, women that their husbands had higher educational levels were more likely to complete antenatal care consultations [OR: 2.70 (95% CI: 1.70–4.31)]. This relationship was observed even after adjusting to potential confounders [adjusted OR: 3.02 (95% CI: 1.69–5.41)].

This quantitative analysis also shows the positive relationship between accessing accurate and prompt services and the completion of antenatal care consultations (Table 1). Indeed, women that receive an additional physical examination and vital sign or additional obstetric physical examination at each consultation, were more likely to complete antenatal care consultations than the women that did not receive the services [OR for additional physical examination:1.99 (95% CI: 1.10–3.62); and OR for additional obstetric physical examination: 8.78 (95% CI: 3.32–23.24)]. These significant relationships were observed even after adjusting for potential confounders [Adjusted OR for additional physical examination:1.90 (95% CI: 1.03–3.48); and adjusted OR for additional obstetric physical examination: 9.10 (95% CI: 3.42–24.23)]. These significant relationships did not observe in the analysis with access to the normal physical examination or normal obstetric physical examination at the first consultations. In addition, women that have access to the examination without waiting for a long time, were more likely to complete their antenatal care consultations than the women waiting for a long time [OR: 1.64 (95% CI: 1.06–2.54)] and this positive relationship remained after adjusting for potential confounders [Adjusted OR: 1.64 (95% CI: 0.99–2.41)].

In contrast, the positive relationship between accessing postpartum examinations and the completion of antenatal care consultations was not observed, but some inverse relationships were observed (Table 1). For example, women that received the primary care/health service after six days or two weeks of delivery were less likely to complete antenatal care consultations compared to women that did not receive the services [adjusted OR for visiting after six days of delivery: 0.60 (95% CI: 0.38–0.95); and adjusted OR for visiting after two weeks: 0.34 (95% CI: 0.21–0.55)]. On the other hand, this inverse relationship was not observed in women that visited the primary health care center after 6 weeks of delivery, and the women tend to complete their antenatal care consultations than the women that did not visit the centers [adjusted OR: 1.15 (95% CI: 0.70–1.89)].

## Focus group discussion

Focus group discussions were conducted with 26 sub-sample of pregnant women, 6 maternity and pediatric staff, 4 head of community health center, 7 public health officer, 7 cross-sector health officer, and 9 community working groups (cadres) to explore about their background and feeling about individual motivation on examination of pregnant women and completion of antenatal care consultations.

## Completion of antenatal care visits

The questionnaire survey discovered that more than half of the respondents did not complete their antenatal care consultations. According to the focus group discussion, it revealed that women preferred to check their pregnancy at a *Posyandu* than community health center. *Posyandu* is an integrated health post and support the delivery of health programs to the residents of the community by village health workers. The routine activity is twice a month. Visiting *Posyandu* might be related to low consultations during the first period by pregnant women as described by two respondents:

*I only had a checkup at the community health center once, because every month there was a Posyandu near the house. (Responder #1, age 30, 7 months gestational age).*

*I often went for a checkup in the private clinic and Posyandu for about 8 visits, except once when I went for a checkup at the community health center for the pregnancy class program. (Responder #2, age 23, 9 months gestational age, second pregnancy).*

## Accurate actions

According to the questionnaire survey, it was revealed that 82.2% of respondents received additional physical examinations and vital sign checkups during each consultation, but only 11% of respondents received an additional obstetric physical examination during the consultation and 89% of respondents did not receive those services. These queries are important to obtain a detailed understanding about the type and timing of the proper examinations needed by pregnant women, and being explored in the focus discussion:

*I went to this community health center last month, and on each consultation, the nurse said I had symptoms of hypertension, but I was not given any medication. (Responder #3, age 20, 5 months*

*gestational age, third child).*

*My gestational age is 7 months, but I have never had any ultrasonography (USG) examinations. According to the other moms, the doctor is fierce. (Responder #4, age 19, 7 months gestational age).*

*My gestational age is 9 months. I only had one USG and the examination took a very long time. When we asked about the condition of the fetus, the doctor did not want to tell us the results, and the doctor just said “you do not need to know the results, the important thing is to know the gender and that the fetus is in good condition,” but we as the mother want to know the condition of our fetus. Finally, I decided to give birth at the Maternity Hospital. (Responder #5, age 22).*

## **Prompt actions**

In the questionnaire survey, half of the participants answered that they had waited quite a long time for an examination. The promptness of actions was based on the service path; generally, pregnant women that attended the registration counter for their consultations received the opportunity to attend an examination based on their number on the queue. However, respondents stated that there was a very long waiting time for examinations. Prompt actions were still constrained by the limited availability of health-care workers and inadequate facilities; therefore, the registration counter queue becomes backed up with the waiting patients. The examination and counseling ideally need to take fifteen (15) minutes, but the check-up schedule coincides with holidays, the number of patients automatically accumulate in the schedule for the next day. Participants in the focus group discussion described the current situation and their feeling:

*I do not understand why the waiting time feels quite long every time I visit the health-care center, although the number of health-care personnel and the available facilities seem sufficient. (Responder #6, age 19, 7 months gestational age).*

*I hesitate to go to the community health center because every time I get a checkup, I only had practicing medical students that examined me as part of their working experience. When these students could not handle my case, a midwife will take over. I think that a midwife should accompany these practicing students or doctors and do not engage in other routine practices when we enter the examination room. We hope that we can have a USG examination at each consultation and that the queuing time is not too long. (Responder #7, age 35, 6 months gestational age).*

## **Postpartum visitation**

Over 96.9% of respondents were examined 6–8 hours after delivery (before returning home). This proportion is decreasing after six days of delivery and increased again with the number of weeks after delivery. The background of these trends was related to the cultural background of some community and is explained by the health officer and other staffs:

*The very low number of postpartum consultations in this community health center is influenced by strong traditions; e.g., mothers that have given birth are forbidden to leave their house before 40 days.*

*Community health center (midwives) anticipates this tradition by visiting them directly in their home. (Responder #8 Midwife Coordinator at Puskesmas Area A).*

*The most important function is to always socialize with midwives and mothers to take directly in order to take over birth control after delivery. The birth control device is strongly recommended to be inserted before leaving the health-care center or returning home (e.g., intrauterine or implanted devices), especially for mothers following their second labor. (Responder #9 Cross Sector Health Officer at Puskesmas Area C).*

## Discussion

This study adopted a mixed-method design and described the positive effects of individual factors and accessible health services on completion of antenatal care during pregnancy. Particularly, the level of education of the husband, frequently undergoing physical or obstetric examinations, and the time allocated for the examination are related to the status of completing antenatal consultations. Then, the qualitative survey described the background and the real problem of each factor. The findings from the quantitative and qualitative explanatory analysis are consistent and supported with each other. Furthermore, these revealed factors related to health services need to be improved and also the factors related to household characteristics need to be considered to improve the intervention or supporting program for maternal and child health.

The questionnaire survey showed that more than half of the respondents did not complete their antenatal care consultations ( $\geq$  four visits). According to the focus group discussion, it was discovered that respondents prefer to visit a *Posyandu* instead of their community health center. This determination might be caused by the lack of detailed information about examinations that pregnant mothers need to undergo at the health center which provides antenatal care. Some examinations packet need to be available in the early gestational age and be followed during pregnancy, *Posyandu does not provide these services*. At the community health center, pregnant women received antenatal care services at low cost and are able to use blood pressure monitoring equipment for free, and also take USG services at low cost, and medical prescriptions are available with an adequate cost [17]. Also, the previous studies reported that pregnant women that normally go for checkups more than 4 (four) consultations experienced a lower risk of neonatal mortality [18], [19]. When a pregnant woman visits *Posyandu*, it's important to inform pregnant women about the types of the examination required and financial support for receiving them and to encourage them to visit community health centers..

The educational level of respondents and husbands was slightly or significantly associated with the completion of antenatal care consultations. In the previous study, it was reported that the educational background of pregnant women contributes to their decisions to postpone their obstetric examination [6] [19]–[21]. Furthermore, this study reveals that women, which husband's educational level are low, is significantly associated with the completion of antenatal care consultations. Pregnant women do not prioritize their pregnancies because of their commitments to their work as housewives and caretakers of

their children and families [22]. In these circumstances, supports from their closest family such as their husband and relative may influence their pregnancy condition. Therefore, the possibility of interventions should be emphasized at every medical encounter with pregnant women [23], which may change their perceptions and attitudes towards the importance of attending both examinations and postnatal consultations, especially for themselves, their family members, and communities [24], [25]. Moreover, the health promotion program may increase the public's awareness about the necessity of antenatal care and postnatal care consultations [21]. These programs need to include men that are or will be a husband in order to increase the number of women that received adequate antenatal care.

Both quantitative and qualitative analyses indicated that the prompt access to examination was associated with the status of completion of antenatal care consultations. According to the focus group discussion, the difficulty for providing prompt examination was due to the limited number of health-care personnel. Indeed, examination rooms at a health center have only two beds, this situation was unable to provide comfort for the patients that are waiting in line to obtain information and direct examinations from competent health-care personnel. The numbers of pregnant women are much higher than the capacity of health care personnel. While on the examination day, not all pregnant women have adequate services due to time constraints and the length of the list in the queue.

In addition, the numbers of a woman going for postnatal care remains low, and the status is not related with the completion of antenatal care consultations in the quantitative analysis. This might be that the factors which influenced the completion of antenatal care consultations and visiting postpartum care might be different, and the focus group discussion depicted the factor such as the cultural background of the community. Some women that have had a postpartum period have restrictions that they cannot leave their homes for 40 (forty) days. These might be related to the low numbers of women that received postnatal examination after less than two weeks of delivery. Women that have had a postpartum need to visit community health centers after 3–7 days of delivery for reducing death due to the puerperium period. Also, this information should be made available at *Posyandu*, where staffs are closely working with members of the community and are familiar with the cultural background of each community.

An important strength of this study is that, through using the mixed-methods design, what kind of treatments and the services needed during pregnancy were identified, and what kind of services that needs to be improved were determined. The results from the quantitative explanatory analyses are supported by the qualitative survey. Nevertheless, the most critical limitation of the present study is that all the data were self-reported by mothers that completed the questionnaire while collecting information, therefore, there is a potential recall bias.

## Conclusions

Individual motivations for performing antenatal care  $\geq 4$  times are related to the social background and the pregnancy conditions of pregnant women. Furthermore, the qualities of examination at the health care center were associated with their motivations for completion, and the qualities are complicated by

the imbalance proportion of pregnant women and health workers. Also, it was revealed that the triggers for visiting the antenatal and postnatal care services tend to be at the time when they sensed problems in their pregnancies or had bad conditions. These circumstances are related to the low number of completion of antenatal care consultations. These factors needs to be considered in order to improve the health policies for the adequate services of pregnant women.

## List Of Abbreviations

CI: Confidence Interval; Cadre: Community Working Group; FGD: Focus group discussion; HIV AIDS: Human Immunodeficiency Virus – Acquired Immune Deficiency Syndrome; OR: Odds Ratio; Posyandu: Pos Pelayanan Terpadu (Integrated Health Post); USG: Ultrasonography; Puskesmas: Pusat Kesehatan Masyarakat: Community Health Center.

## Declarations

## Ethics approval and consent to participate

Ethics approval letter was secured from Institutional Review Board of Muhammadiyah Makassar University (Reference No: 092/Izn-05/C.4-VIII/39/2018). Additional support letter was obtained from Local Ministry of Health as required from each Community Health Center office. Written and oral informed consents were obtained from all participants.

### Consent for publication

Not applicable

## Availability of data and materials

The datasets used and analyzed in this study are available from the corresponding author on reasonable request.

## Competing interests

The authors declare that they have no competing interest

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## Authors' contributions

<sup>1</sup>Juliani Ibrahim, Public Health Department, Faculty of Medicine, Muhammadiyah University of Makassar South Sulawesi, Indonesia initiated the research designed the research, corrected the data.

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