



## Original Research

# Maternal health literacy and adherence to recommended ANC contact among pregnant women in Indonesian

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### Abstract

Maternal health literacy (MHL) equips pregnant women to seek timely Antenatal care (ANC). Through ANC, health workers can provide education that contributes to reducing the maternal mortality rate. This research aims to investigate the relationship between MHL and adherence to recommended ANC contacts and explore how mothers experience accessing ANC. The study design was a mixed-method study. A total of 305 pregnant women with various characteristics participated in this study. Quantitative data analysis used simple linear regression, while qualitative used Collaizi's strategy. The research found a positive relationship between MHL and adherence to recommended ANC contact with  $R^2 = 0.18$ ;  $F(1, 303) = 6.533$ ,  $p < 0.05$ . Three themes represented the phenomenon of pregnant women in carrying out ANC: 1) perceptions about ANC, 2) challenges faced by pregnant women in accessing recommended ANC contact, and 3) supporting factors in doing routine ANC contact. Pregnant women with higher MHL have higher adherence to ANC contact. Health workers and policymakers can involve the results of this research in efforts to revise or make policies related to increasing pregnant women's ANC contacts.

## INTRODUCTION

Indonesia has one of the highest Maternal Mortality Ratios (MMR) among Southeast Asian countries.<sup>1</sup> Amid the COVID-19 pandemic situation, maternal mortality rates have soared. The maternal mortality rate increased by 300 cases from 2019 to around 4,400 deaths in 2020.<sup>2</sup> Maternal mortality continues to be a problem for this country because the country did not meet the United Nations' 2015 Millennial Development Goals Target 5, which aimed

to reduce the maternal mortality rate by 75%. Thus, efforts to reduce maternal mortality have been extended to achieve the 2030 Sustainable Development Goals' target MMR of less than 70 for every 100,000 live births.<sup>1</sup>

Managing health and adopting a healthy lifestyle during pregnancy are keys to reducing maternal mortality.<sup>3</sup> Pregnant women receive myriads of information daily from multiple sources about their own and their fetus' health. Data from various

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sources may confuse their health decisions.<sup>4</sup> As one component in the highest level of maternal health literacy (MHL) dimension, an appraisal is needed to choose valid and evidence-based information.<sup>5</sup>

MHL is a concept that refers to a set of skills that enable women to gain access to, comprehend, evaluate, and apply knowledge about pregnancy to enhance health quality and outcomes throughout pregnancy. Pregnant women are a population that needs adequate MHL to sort out the amount of health information they encounter during their pregnancy, some of which are unreliable. MHL empowers pregnant women to manage their health and fetus and create a healthier lifestyle and prevention strategies for pregnancy complications.<sup>6,7</sup> MHL is a strong predictor of the use of maternal health care services, one of which is ANC. MHL equips pregnant women to seek timely Antenatal care (ANC) as an element of maternal healthcare services for early detection and prevention of pregnancy complications.<sup>8-10</sup>

ANC enables pregnant women to receive a broad range of medical services.<sup>11</sup> ANC should begin early in pregnancy, as it is critical to the continuum of care to ensure continuity of care for mothers, newborns, and children. Experts can teach women about the advantages and processes of facility delivery and the benefits of exclusive breastfeeding along this continuum of care. Additionally, they can schedule appointments for postpartum and postnatal care and educate and provide family planning strategies to women.<sup>12</sup>

Previous studies focused on reducing MMR to improve access to maternal health services; however, there is limited information on the MHL status among pregnant Indonesian.<sup>13-15</sup> Moreover, some references explained the role of ANC in improving MHL.<sup>16-18</sup> Increasing MHL is essential to improve maternal healthcare services utilization, maternal health, and pregnancy outcomes.<sup>7,10,19</sup> Therefore, this

study assessed MHL and adherence to recommended ANC contact. In addition, this study explored pregnant women's experiences in Indonesia accessing ANC during their pregnancy period.

## METHODS

We set the inclusion criteria for this study as follows: pregnant women at least 18 years old (legal age to do self-consent) and able to speak and write Indonesian. We excluded the pregnant women who had a complication during their pregnancy. This study employed a mixed-method research design. For the quantitative method, we used a simple linear regression to assess the relationship between a single continuous explanatory variable and a single continuous response variable that varies linearly over a range of values.<sup>20</sup> Simple linear regression predicts MHL from adherence to recommended ANC among pregnant Indonesian women.<sup>21</sup> This strategy was followed by an in-depth interview with the participants, exploring the utilization of ANC or maternal healthcare services for the qualitative phenomenology approach.

This study involved pregnant women as participants; thus, research ethics became our concern. We gave full attention to the ethical principles mentioned in the Belmont Report year of 1978, including human dignity, beneficence, and justice. The written approval was obtained from the Research Ethics Committee with serial number 093/018/XII/EC/KEP/Lemb.Candle/2021. Once we acquired the ethical clearance for our study, we started searching for potential samples. Purposive sampling was set as a sampling strategy to recruit the participants. Pregnant women who met the inclusion criteria were recruited as participants.

The study setting was rural-urban areas in Central Java and East Java, Indonesia. The choice of the location was considering the

diverse characteristics of pregnant women in those regions, so we intended to achieve generability in our sampling. Moreover, the rural-urban fringe area has unique demographic attributes due to the influence of cultural and geographic conditions from rural and urban. Pregnant women who participated in this study were given a shopping voucher at a nearby baby shop to appreciate their active participation.

The sample size in this study was determined using G\*Power with a power value of 0.80, alpha 0.05, and effect size 0.3. The number of participants in this study was 305 pregnant women, which made this sample size sufficient to meet the sampling requirement. Pregnant women in this study contained 103 for the first trimester, 102 for the second trimester, and 100 for the third trimester.

Various measurement tools have been developed to measure MHL but are limited to Indonesian versions. We translated and adapted an MHL measurement named the Maternal Health Literacy Inventory in Pregnancy (MHELIP).<sup>22</sup> We selected this tool because it is specifically designed for measuring MHL in pregnant women and has good validity and reliability. The MHELIP has 48 items grouped into four dimensions measuring MHL in pregnancy: maternal health knowledge, search for maternal health information, assessment of maternal health information, and maternal health decision-making and behaviour. Our Indonesian version of the MHELIP has good validity and reliability, with Cronbach's alpha of more than 0.90 and a person separation index (PSI) of more than 3.0.

The MHELIP scoring system uses five Likert scale subscales, with responses ranging from 1 (I do not know at all) to 5 (I know fully) for the first subscale and 1 (Not at all) to 5 (Always) for the second, third, and fourth subscales, respectively. The total score of the MHELIP is calculated linearly from the value in every dimension and then converted into 1 to 100. The score will then

be divided into four categories: 1-50 is insufficient, 50.1-66 is problematic, 66.1-84 is adequate, and 84.1-100 is excellent.<sup>6</sup>

For data analysis, we transferred the data managed by Microsoft Excel (2011), into the SPSS 22.0 version. After it, we underwent the descriptive statistic, such as frequency, percentage, mean, standard deviation, and median of the demographic and maternal health literacy. We analyzed the correlation between maternal health literacy and adherence to recommended ANC contact with Analysis of Variance (ANOVA). For the qualitative phenomenology approach, we analyzed the data using Coallizi's qualitative data analysis.

## RESULTS

### Characteristics of the Participants

Based on the descriptive characteristics depicted in Table 1, the sample in this study was reasonably representative, with ages 20 to 36 years and various gestational ages. Half of the participants were nullipara; the last were multipara with a second and third pregnancy. Most of the pregnant women who participated in this study had attained high school (53.8%) with a monthly income ranging from 1,500,000 IDR to 2,500,000 IDR. Out of 305 pregnant women screened for maternal health literacy using the MHELIP, most of them had inadequate MHL (35.1%). Pregnant women who participated in the interview section exploring ANC or maternal healthcare services utilization were chosen purposively following the inclusion criteria mentioned above. The pregnant women with different educational levels shared their experience accessing maternal healthcare services or ANC contact. With various gestational ages and parity, the information they give represents the phenomenon under study.

Table 1  
Characteristics of the participants

| Characteristic  | Min   | Max   | M (SD)         |
|-----------------|-------|-------|----------------|
| Age             | 20    | 36    | 26.72 (3.521)  |
| Education       | 3     | 5     | 4.31 (.605)    |
| Income          | 1     | 4     | 2.04 (.875)    |
| Gestational age | 4     | 33    | 19.29 (8.346)  |
| Parity          | 1     | 3     | 1.56 (.797)    |
| MHL             | 21.88 | 89.58 | 57.00 (17.225) |

**Prediction of the adherence to recommended ANC contact by assessing MHL**

Simple regression was conducted to investigate how well MHL predicted adherence to recommended ANC contact. The result was statistically significant,  $F(1, 303) = 6.533, p < 0.05$ . The adjusted  $R^2$  value was .018. This indicated that MHL explained 18% of the variance in adherence to recommended ANC.

**Pregnant women’s adherence to recommended ANC contact phenomenon**

Besides understanding that MHL has significance in the adherence to ANC, supported data about recommended ANC contact among pregnant women needs to be explored. Exploration of the experience of maternal healthcare services utilization during pregnancy is essential to build the phenomena related to it. Thus, the study's next step was to strengthen the evidence on adherence in ANC contact and MHL through qualitative exploration.

In-depth interviews were done with the participants. Data saturation reached the 11<sup>th</sup> participants and derived three themes under the experience of adherence to access the recommended ANC contact among pregnant Indonesian women. Table 2 is summarized the theme and subtheme of the phenomenon.

Table 2  
Theme and sub-themes of pregnant Indonesian women’s adherence to recommended ANC contact phenomenon

| Sub-theme   | Theme   |
|---|---|
| 1. The role of ANC contact  | Perceptions of ANC contact  |
| 2. Reasons to acquire ANC contact                                   |   |
| 3. The timing to access ANC contacts                                |   |
| 4. Places to access ANC contact                                     |   |
| 1. Low motivation   | Challenges faced by pregnant women in accessing recommended ANC contact |
| 2. Social-culture and belief  |   |
| 3. Time restriction   |   |
| 4. Financial burden   |   |
| 5. Fear and shame of the pregnancy                                  |   |
| 1. Self-motivation  | Supporting factors in doing routine ANC contact                         |
| 2. Support from spouse and family members                           |   |
| 3. Continuous support from cadres (community healthcare volunteers) |   |

Understanding the adherence to recommended ANC can be achieved by getting the pregnant women’s point of view on the meaning of ANC contact in their pregnancy period. The first theme that emerges under the phenomenon of pregnant Indonesian women’s adherence to recommended ANC contact is perceptions about ANC contact. This theme represents pregnant women's views on ANC contact, including time, places, roles, reasons, and other opinions related to ANC contact. There are three subthemes under the first theme: 1) the role of ANC contact, 2) reasons to acquire ANC contact, 3) the timing to get the ANC contacts, and 4) places to access ANC contact.

One of the participants stated that ANC contact is essential, especially during the pregnancy, as stated bellow:

*“Periksa kehamilan itu penting mbak. Kalo menurut saya dengan melakukan pemeriksaan kehamilan itu ya untuk mengetahui kesehatan ibu dan janin...”*  
~P10

*(“ANC is essential. In my humble opinion, by doing ANC contact, pregnant women can understand about mother’s health and also her fetus...” ~10)*

The other role of ANC contact, according to a pregnant woman, is screening the history of diseases and whether they can be vertically transmitted to her baby, as follows:

*“..harus periksa mbak, paling tidak dengan periksa kita bisa tau kondisi ibu, bisa juga sekalian ngecek-ngecek kalo ada penyakit ato tidak. Terutama saya mbak, yang pernah sakit kan harus cek-cek...” ~P4*

*(“...I think it is compulsory to do screening, at least by doing that we can understand mother’s health condition and another potential disease. Especially for me, I have a history of diseases, so it is a must for me...”) ~P4*

Besides pregnant women understanding the roles of ANC contact, they fully understood the reasons for assessing maternal healthcare service or to do ANC contact. The nulliparous stated their curiosity to make sure the baby’s condition and position as the reason for doing ANC contact:

*“Aku hamil pertama kan mba, aku takut kalo ada apa-apa dengan kehamilan pertamaku. Makanya aku periksa hamil, ya buat mastiin mbak bayiku sehat. Itu kan temenku bilang, kalo hamil dan akunya masih muda kadang posisi bayinya engga pas. Aku juga pengen mastiin posisi bayiku itu pas...” ~P2*

*(“It is my first pregnancy, so I made sure about my pregnancy. Thus, I made ANC contact to ensure my baby’s condition was in my womb. Moreover, my friend said that I am too young to face pregnancy, so there is an opportunity for my baby’s disposition. By doing ANC*

*contact, I wanna make sure about my baby’s position...”) ~P2*

A multiparous pregnant woman narrated the reason for doing routine ANC contact due to her miscarriage in her previous pregnancy, as stated by one of the participants:

*“Alasannya...karena anakku sebelumnya tidak mau dimong mbak, jadi aku hati-hati sekali. Aku takut kalo perkembangan bayiku yang sekarang tidak baik, terlalu besar gitu...aku kan punya penyakit DM. Ya, takut kalo bayinya terlalu besar...” ~P1*

*(“The reason is... because my baby, previously, was dead, so I learned how to take care of my pregnancy. I’m afraid that my second baby will grow abnormally or become a huge baby...because I have a history of diabetes mellitus. Yes, I have petrified my baby is macrosomia...”)~P1*

Other perceptions related to accessing ANC contact are about time and place. A good behaviour shown by one pregnant woman that she understood that the best time to visit the doctor or midwife is when she experiences signs of pregnancy, as follows:

*“Saya sudah pengalaman sama kehamilan sebelumnya, jadi saya periksa saat saya merasa ada tanda-tanda mengarah ke kehamilan mbak... ya pas bulan-bulan pertama kehamilan...” ~P9*

*(“I have a pregnancy experience, so I did the ANC when I found pregnancy signs...I think it was at the first month of pregnancy...”) ~P9*

On the other hand, a pregnant woman went to a primary healthcare centre to do ANC contact when the cadres of healthcare volunteers forced them to do it:

*“Sebenarnya saya agak gimana gitu kalo periksa hamil. Saya periksa kalo bu*

kader itu kaya *nggaga-gage (mendesak-red)* saya buat ke Puskesmas, katanya udah didaftarkan untuk periksa hamil. Jadi saya berangkat ke Puskesmas mbak, periksa..." ~P8

*("Actually, I have no specific reasons for my pregnancy examination. I made the ANC contact when the cadres forced me to go to Puskesmas (primary health centre -red), and she said that I needed to check my pregnancy. Yeah, for that reason... finally I went to Puskesmas")* ~P8

Pregnant women have their own recommended places to contact ANC or get their maternal healthcare services, including Puskesmas or primary health center, obstetric gynaecology doctors, and midwives. Most participants did their ANC at Puskesmas because it is free and as recommended by the cadres in their community. But, some pregnant women decided to do ANC contact in an independent midwifery clinic because they already knew the midwives and were closer to their homes. A reason to do ANC contacts in an obstetric gynaecology doctor clinic is due to the limited time they have because the ob-gyn doctor clinics are open in the evening. Moreover, the pregnant women who decided to do ANC contact there have better financial conditions.

### **Theme 2: Challenges faced by pregnant women in accessing recommended ANC contacts**

There are five subthemes built under this theme: 1) low motivation, 2) social culture and belief, 3) time restriction, 4) financial burden, and 5) fear and shame of pregnancy.

Participants stated that laziness and low motivation were burdens to assessing ANC contact. These feelings emerged due to the routine procedures when doing ANC contact:

"Apa ya mbak... kalo untuk periksa hamil nanti dulu lah... saya sudah tau kalo periksa ya gitu-gitu aja, malas jadinya..." ~P8

*("What is it... if it's for a pregnancy check-up, I think it better to pending... I already know the procedure and routine, so I feel lazy about it...")* ~P8

Another reason for low motivation to access routine ANC contact is the family's belief. One of the participants said that her mother protected her pregnancy by avoiding her to go outside:

"Ibu saya bilang kalo hamil itu diminimalkan untuk keluar-keluar. Mendingan di rumah saja mbak, karena orang hamil itu banyak *sawan-nya (godaan dari makhluk halus -red)*...periksa hamil ya di dulu itu aja cukup..." ~P11

*("My mother said that getting pregnant minimized going out. It's better to stay at home because pregnant people have a lot of seizures (temptations from spirits -ed)...check for pregnancy first, that's enough...")* ~P11

Time and financial issue became the limitation to do continue ANC contact among the pregnant women. One of the participants stated that having 24 hours for her is not enough as a mother and pregnant woman. Moreover, she needs to wait her husband coming home, so she can go for ANC contact:

"Saya tinggal di rumah sendiri, maksudnya kalo suami saya kerja kan saya cuma sama anak saya, dia masih kecil. Tidak ada waktu mbak untuk periksa, ngurus anak, ngurus rumah, kadang kurang-kurang waktunya. Suami pulang *nukang (kerja -red)* juga sore, jadi waktunya terbatas kalau untuk periksa..." ~P6

*“I live at home alone, meaning only my little son and me, when my husband goes to work. There is no time to go for ANC contact because I need to take care of my kid and do the household chores, and sometimes, there is not enough time. Husband comes home from work as a bricklayer is too late, so time is limited to go to healthcare facility...” ~P6*

The last subtheme in this theme is fear and shame of pregnancy. This subtheme emerged due to some statements from the participant about their negative idea about their pregnancy. A young pregnant woman said that she was afraid and shame if she went for ANC contact, as follows:

*“Pertama aku periksa kan mbak, aku tu masih muda banget dibanding pasien-pasien hamil lainnya yang lagi antri periksa. Itu yang buat aku takut mbak dan kadang tu malu kalo mau periksa lagi...” ~P9*

*“The first time I came for ANC contact, I was very young compared with the other pregnant women in the examination queue. This condition made me feel ashamed of accessing the next ANC contact...” ~P9*

Another feeling of shame narrated by a participant about their pregnancy was because the spacing of pregnancies was too close. This reason becomes a burden for accessing maternal healthcare services among pregnant women, as stated below:

*“Sebenarnya saya malu kalo harus datang periksa hamil. Saya malu kalo dibilang hamil lagi, karena jarak anak-anak saya dekat mbak...” ~P8*

*“To be honest, I feel shame when coming for ANC examination. This shameless come along my pregnancy due to close pregnancy spacing...” ~P8*

### **Theme 3: Supporting factors in doing routine ANC contact**

Understanding how pregnant women adhere to the recommended ANC contact was synthesized as the perceptions and burdens of accessing the services. Moreover, another theme from the in-depth interview was supporting factors in routine ANC contact. This theme has three subthemes: self-motivation, support from spouses and family members, and continuous support from cadres (community healthcare volunteers).

Self-motivation is typical to support coming from a pregnant woman. One of the participants stated that she routinely checked the maternal booklet and made reminders of the ANC contact schedules, as follows:

*“Saya nulis jadwal di kalender mbak, dan juga ngecek di buku KIA (*Kesehatan Ibu dan Anak -red*). Karena sudah anak dua dan kadang sebenarnya ada rasa kenapa harus pergi periksa gitu, padahal saya uda tahu apa yang dilakukan dokter kalo periksa, tapi saya harus disiplin periksa. Ini untuk kebaikan saya dan anak saya. Saya tahu usia saya sudah masuk usia risiko dalam kehamilan ini.” ~P33*

*“I made reminders of my ANC contact plan in my calendar and double-checked my maternal health booklet. Sometimes I thought it necessary to do ANC contact when I got my third pregnancy. I already know about the procedures and examinations, but I need to be disciplined again. Because I know my maternal age is categorized as risk pregnancy.” ~P3*

The following support comes from the spouse and family members. One of the participants stated that as she entered her pregnancy, her husband became more supportive even though they were in long-distance marriage status. Her husband always reminds her to do ANC contact, and so does her mother-in-law:

“Gimana ya mbak. Saya bersyukur banget ya punya suami yang baik. Walo dia kerja jauh-jauhan dari saya dan pulang paling empat sampai enam bulan sekali, tapi dia selalu ingetin kapan harus periksa. Kebetulan saya kan tinggal sama keluarga dia, ibu mertua juga perhatian mbak...pas awal itu karena suami tidak di rumah, bapak ibu mertua saya yang ngaterin periksa...hehe...” ~P10

*“How to say. I feel so grateful for having him as my husband. Even though we live separately due to his work and he returns home every four to six months, he always reminds me about the time to do the ANC examination. Fortunately, I live with my mother-in-law, she is so kind...at the beginning of my pregnancy, my parents-in-law were the ones who accompanied me going for ANC contact because my husband wasn't home...” ~P10*

External support also came from the neighbours and cadres. One of the participants said that her neighbour offered to lend her a car to reach the maternal healthcare facility where she does the pregnancy examination because the participant has no car. Moreover, support from cadres strengthens the pregnant women to do recommended and routine ANC contact, as mentioned below:

“Ya Allah mbak, bu kader itu semangat banget. Mendukung ibu-ibu hamil di kampung ini buat periksa mbak. Harus sehat semua katanya, ibu dan bayi. Kalo ada vitamin atau gizi (*nutrisi tambahan dari Puskesmas -red*) bu kader itu mbak...bu kader bagi-bagikan ke ibu hamil...” ~P7

*“Oh my God, the cadres gave me positive energies. They supported all the pregnant women in this community to do ANC contact. No one is left behind, and they must be healthy, both mothers and babies. The cadres gave us vitamins and*

*nutritious food as programmed by the government or Puskesmas...” ~P7*

## DISCUSSION

To the best of our knowledge, this study was the first to assess how MHL predict adherence to recommended ANC contact among pregnant women in Indonesia. The findings of this study reveal a significant positive relationship between MHL and adherence to recommended ANC. The higher the score of MHL the pregnant women had, the better adherence to recommended ANC contact in maternal healthcare services nearby.

Previous studies confirmed those results and showed that higher MHL levels received adequate prenatal care.<sup>7,23</sup> Researchers have linked MHL to the utilization of maternal healthcare services.<sup>8,10,24</sup> MHL has been associated with the timing and frequency of ANC and some positive behaviours in pregnancy.<sup>25-27</sup> Inadequate MHL results in an inability to locate and understand the appropriate timing of the first ANC contact, which may negatively impact maternal and child health.<sup>8,19</sup>

The MHL of pregnant women contributed to their understanding and knowledge used to protect and promote their health. Since they need to achieve a targeted health status during pregnancy, pregnant women need to acquire recommended ANC. ANC is one of the efforts to promote health and prevent complications that might be happened during pregnancy period.<sup>28</sup> A low level of MHL prevents pregnant women from reaching the right expertise and maternal health services. Moreover, MHL that pregnant women have helped them to use the resources appropriately and be competent in their health and community health<sup>29</sup>.

This research has the advantage of providing answers to important questions about maternal health literacy among pregnant women. General health literacy



instruments were utilized in studies measuring the health literacy of pregnant women, but a specific instrument measuring maternal health literacy was devised. This study tried to give evidence that a particular tool to measure specific concepts needs to be considered to conclude the best result of a variable measurement. Qualitative data from the interviews enriched and supported the role of MHL as a predictor of adherence to recommended ANC contact.

The exploration of experiences among pregnant women in this study explained that they received various information related to their pregnancy from various sources. This valid information led the pregnant women to build perceptions about ANC contact, including the roles, reasons, timing, dan places to acquire ANC contact. The pregnant women's perception contributed to the decision to take action, which is ANC contact.<sup>29</sup> The components that led to the decision among pregnant women to contact healthcare professionals, including nurses, midwives, and doctors, met with the dimensions of MHL. Previous studies mentioned that these dimensions could not be separated from pregnant women's actions to improve their health and achieve better pregnancy outcomes.<sup>18,19</sup>

Since the pregnant women decided to adhere to recommended ANC contact, they faced some challenges. This study analyzed that low motivation, social-culture and belief, time restriction, financial burden, and fear and shame of the pregnancy became the challenges in accessing ANC or maternal healthcare services. Some challenges may be found and affect the pregnant women's decision to do ANC contact.<sup>13</sup> Pregnant women who cannot take care of the challenges were more likely to have high-risk pregnancies than their counterparts.<sup>11</sup> Pregnant women with a higher level of MHL can turn back the challenges they faced in deciding to make an ANC contact into an opportunity they have

to maintain their health and their babies.<sup>10,27</sup>

Pregnancy is a vulnerable condition requiring attention and support from healthcare providers, people around pregnant women, and significant others.<sup>9,30</sup> The pregnant women in this study exposed some supporting factors in routine ANC contacts, such as self-motivation, support from spouses and family members, and continuous support from cadres or community health volunteers. These supports are valuable for the continuity of pregnancy among pregnant women. Pregnant women with a high level of MHL can effectively communicate it in their daily once they get support from people around them.<sup>17,19</sup> A set of skills about how to access, understand, appraise, and apply the maternal health information pregnant women got contributed to building better healthy lifestyles and pregnancy outcomes that are essential in reducing MMR in Indonesia.<sup>15,22,31</sup>

The findings of this study can help to a better knowledge of the impacts of maternal health literacy on various outcomes and maternal healthcare service utilization, particularly during pregnancy. Researchers and policymakers who seek to create and support maternal health literacy-sensitive treatments beginning during pregnancy can benefit from the findings of this study.

Limitation of the study includes the study sampling and setting. Participants in the study were gathered from the community without considering the pregnant women in clinical settings. Moreover, we limited the location of this study to the rural-urban area. MHL levels among pregnant women in clinical settings and diversities areas may vary and can give additional information related to MHL and recommended ANC among pregnant Indonesian women.

## CONCLUSION

This study reveals that MHL is a good predictor of adherence to recommended ANC contact among pregnant Indonesian women living in the rural-urban area. A pregnant woman with a higher level of MHL has better adherence to recommended ANC contact. The adherence to ANC contact shown in the phenomena of maternal healthcare services utilization under three themes, including the perception of Knowing better about the ANC contact among pregnant women, could build better insight into improving the quality of ANC as a part of the effort to reduce MMR in Indonesia.

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