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Disparities in utilization of maternal health services in the rural areas of Indonesia: an analysis among provinces with low, middle, and high poverty rates

I Ketut Swarjana[1], Natkamol Chansatitporn[2], Nawarat Suwannapong[3], Punyarat Lapvongwatana[4], Kwanjai Amnatsatsue[4]

[1]Doctoral Candidate in Doctor of Public Health Program, Faculty of Public Health, Mahidol University, Bangkok, Thailand
[2]Department of Biostatistics, Faculty of Public Health, Mahidol University, Bangkok, Thailand
[3]Department of Public Health Administration, Faculty of Public Health, Mahidol University, Bangkok, Thailand
[4]Department of Public Health Nursing, Faculty of Public Health, Mahidol University, Bangkok, Thailand

Corresponding Author: *Natkamol Chansatitporn* ***Email:*** *nutkamol.cha@mahidol.ac.th*

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ABSTRACT

High maternal mortality in Indonesia is a serious issue, as it is indicative of health disparities. Moreover, maternal mortality is closely related to the use of maternal health services (MHS). This study aimed to assess disparities in MHS utilization and to identify factors associated with MHS utilization in rural areas of Indonesian provinces with low, middle, and high poverty rates. A cross-sectional study was conducted among 768 mothers with children younger than one year old. The respondents were selected using a multistage sampling technique. The methods used in this study included interviews of respondents using a questionnaire, a proportional comparison of the disparities, and multiple logistic regression to examine the factors associated with MHS utilization. The study found disparities in MHS utilization among the three selected provinces, except for the utilization of family planning services. The factors of health insurance (Adj.OR: 9.22), knowledge (Adj.OR: 6.39), availability (Adj.OR: 6.27), and affordability (Adj.OR: 8.81) were associated with the utilization of antenatal care services, while education (Adj.OR: 4.86), health insurance (Adj.OR: 4.83), availability (Adj.OR: 3.70), and affordability (Adj.OR: 13.22) were significantly associated with the utilization of delivery services. Similarly, health insurance (Adj.OR: 5.02), knowledge (Adj.OR: 2.41), availability (Adj.OR: 3.39), affordability (Adj.OR: 5.91), and acceptability (Adj.OR: 2.21) were factors associated with postpartum follow-up services. Finally, health insurance (Adj.OR: 3.62), availability (Adj.OR: 2.26), and affordability (Adj.OR: 2.06) were associated with the use of family planning services. Strengthening policies to reduce these disparities is urgently needed to improve access to MHS in rural areas of provinces with high poverty rates in Indonesia.

Keywords: disparities, maternal health services utilization, rural area, Indonesia

INTRODUCTION

High maternal mortality ratio (MMR), particularly among low-middle income countries constitutes a major global health issue[1]; daily, 830 women die globally due to complications of pregnancy and delivery. Ninety-nine percent of maternal mortality occurs in developing countries.[2, 3] South Asia and Sub-Saharan Africa contribute to 85% of maternal mortality worldwide.[1, 4] The MMR in Indonesia is the highest among Southeast Asia[5] and has remained stagnant[6] (305 per 100,000 live births), creating a high burden.[7] The World Health Organization (WHO) and the United Nations' Sustainable Development Goals (SDGs) established a target to decrease maternal deaths worldwide to fewer than 70 per 100,000 live births by 2030.[8, 9]

Maternal death is greater among women living in rural and poorer areas.[2] The deaths are primarily caused by pregnancy complications[10] and are related to low utilization of maternal health services (MHS), including antenatal care (ANC) and delivery services.[11] According to the WHO, pregnancy complications occur due to lack of quality care before, during, and after delivery.[12] Limited access to and use of MHS contribute to inadequate detection, prevention, and treatment of complications, and accordingly contributes to maternal death.[13]

The United Nations' Universal Declaration of Human Rights and the WHO Constitution state that health is a human right, including equal access to and use of health services.[14, 15] The SDGs also emphasize the importance of universal access to and utilization of healthcare.[8] Further, the 67th World Health Assembly called to all member countries to improve universal health coverage in order to increase the access to and use of health services.[16] Andersen et al[17] divided access into "potential" access, consisting of the three factors of availability, affordability, and acceptability[15, 18], and "actual" access, meaning the use of health services. Additionally, Aday et al[19] stated that the preferred way to measure whether access to health services has been realized is to count the frequency of visits or the utilization of health services.

Economic crises around the world are a serious impediment to global health and are closely related to health disparities.[20] An economic downturn contributes to unemployment and reduced income, and the government response is often to cut social spending, which reduces access, utilization, and quality of health services.[21] Approximately one billion people globally do not have access to essential health services, and the lack of access impacts efforts to improve global health.[22]

Essential MHS in Indonesia is defined as a minimum of four ANC visits[23], an institutional delivery, at least three postpartum follow-up visits, and at least one family planning services visit after delivery.[24] However, Indonesia has challenges related to the use of health services. Firstly, the country has 17,744 islands with a population of 264 million[6, 25], more than 300 ethnicities, 730 languages[6], and myriad traditional beliefs.[26] Secondly, the majority of people have obtained below a senior high school level of education.[7] Thirdly, two-thirds of Indonesian women of reproductive age do not have health insurance.[27] Fourthly, the health services infrastructure contains inequality among provinces, resulting in discrepancies in MMR.[28] Lastly, there are large income differences that are reflected in the poverty rate among provinces.[29]

National Health Report of Indonesia has reported that the recommended ANC utilization (at least four visits) increased from 70.0% in 2013[30] to 85.2% in 2016[31], while use of delivery services improved from 66.7% to 83.7% in 2013 and 2017,

respectively.[7] However, utilization of postpartum follow-up services decreased from 86.4% to 84.4% in 2013 and 2016.[31] Similarly, utilization of family planning also declined, from 76.7% to 63.2% in 2013 and 2017.[7]

Low MHS utilization has been shown to be closely related to MMR.[11] Overall, few studies on MHS have been conducted in rural areas of Indonesia, and there is a lack of studies on disparities in MHS utilization among provinces with low, middle, and high poverty rates in Indonesia. Hence, the objectives of this study were to assess disparities in MHS utilization in rural areas of provinces with low, middle, and high poverty rates in Indonesia and to identify the factors associated with such disparities.

METHODS

Study design and setting

A cross-sectional study was conducted in the rural areas of three provinces with different poverty rates. Classification of a low, middle, or high poverty rate for each area was based on the percentage of the population below the poverty rate, or Head Count Index (HCI). Bali, East Java, and NTT Provinces were classified as low, middle, and high poverty rates with 3.91%, 10.85%, and 21.03% of the population below the poverty rate, respectively.[29, 32] Bali, East Java, and NTT Provinces have nine, 38, and 22 districts, respectively.

Sample size estimation and sampling

The sample size was estimated using a 95% confidence interval, while the proportion of previous access was 85%[31], precision was 5%, and the design effect (deff) was 2. A total of 768 mothers were selected as study respondents. Eligibility criteria required that each mother had a child younger than one year old and voluntarily agreed to participate in this study. Those individuals who could not communicate in Bahasa Indonesia were excluded. Multistage random sampling was performed. In each province, one district, two sub-districts, and four villages were randomly selected. Based on this method, approximately 64 respondents in each village were recruited using simple random sampling.

Measurement

A structured questionnaire was developed based on the literature review. The questionnaire consisted of four parts. Part 1 asked each respondent to identify general demographic characteristics consisting of the mother's age, number of children, education, occupation, and possession of health insurance.

Part 2 identified the respondent's MHS utilization with two response categories ("Yes" or "No" utilization) as to each of four types of services. Firstly, ANC service utilization was measured by visit frequency. A "Yes" response corresponded to at least four visits by the respondent during pregnancy following an appropriate schedule. A "No" response corresponded to fewer than four visits during pregnancy or at least four visits following an inappropriate schedule. Secondly, respondents were asked about their utilization of delivery services, for which a "Yes" response indicated that the child was delivered in a health facility, and a "No" response indicated that the child was delivered at home and/or by an unskilled birth attendant. Thirdly, respondents were asked about their postpartum follow-up visits; a "Yes" response indicated at least three follow-up visits within 42 days after birth, while a "No" response indicated

fewer than three follow-up visits within 42 days after birth. Fourthly, respondents were asked about their use of family planning services. For this question, a "Yes" response indicated that the respondent had visited a health facility for counseling and use of contraception, while a "No" response indicated that the respondent had not visited a health facility for counseling and use of contraception.

Part 3 of the questionnaire examined the respondent's knowledge of MHS. Part 4 inquired as to the respondent's traditional beliefs related to ANC, delivery, postpartum follow-up, and family planning services. Part 5 identified the availability of health facilities (MHS information, healthcare providers, waiting time, and distance from house to health facility). Part 6 of the questionnaire examined the affordability of MHS based on the respondent's ability to pay the cost of ANC, delivery, postpartum follow-up, and family planning services, as well as medicine, transportation, and meals. Affordability was measured on a scale of completely, somewhat, and not affordable). Part 7 of the questionnaire inquired as to the acceptability of the health care provider's manner (on a scale of very unacceptable, unacceptable, neutral, acceptable, and very acceptable) and the respondent's satisfaction with the provider's service (on a scale of very unsatisfied, unsatisfied, neutral, satisfied, and very satisfied).

Parts 4 through 7 were categorized into three groups based on Bloom's cut-off points: below 60% (poor), 60%-79% (fair), and 80%-100% (good).[33, 34] The three categories were then converted into two categories (poor or fair, and good) for analytical purposes. A pre-test for reliability was conducted on 40 rural mothers with children younger than one year old. The result of the reliability test (Cronbach's alpha coefficient) was greater than 0.7 for all seven parts of the questionnaire.

Data collection procedures

The structured questionnaire was administered through face-to-face interviews by the researcher and six trained research assistants. The study protocol was approved by the ethics committee of the Faculty of Public Health, Mahidol University (COA. No. MUPH 2018-130; August 23, 2018). Permission for data collection was provided by Bali Province (070/04382/DPMPTSP-B/2018), East Java (070/9389/209.4/2018), and NTT Province (070/4081DPMPTSP/2018) of Indonesia. All respondents were interviewed during the period from September to December 2018. All respondents provided written informed consent and were guaranteed that their responses would be kept confidential. The response rate was 100%, and there were no data omissions.

Data analysis

The Statistical Package for Social Sciences (SPSS), version 18, was used for data entry and analysis. Descriptive statistics, including number and percentage, were used to measure MHS utilization in the three selected provinces. Further, multiple logistic regression was used to examine factors associated with MHS utilization.

RESULTS

Table 1 provides a breakdown of the general characteristics of the 768 respondents, categorized by the selected rural areas of three Indonesian provinces with low, middle, and high poverty rates. The majority of the respondents in each poverty rate category were 20 to 35 years old (85.5%, 89.1%, and 92.2%, respectively) and had one or two children (80.5%, 84.8%, and 68.4%, respectively). Those respondents attaining a primary school education or below represented

70.3%, 51.6%, and 69.1%, respectively, of the respondents. Employed respondents comprised 52.3%, 46.9%, and 51.6%, respectively, of the total. Furthermore, those having health insurance represented 62.9%, 38.3%, and 53.9% of the respondents in provinces with low, middle, and high poverty rates, respectively.

Table 1 General characteristics of respondents among rural areas of provinces with low, middle, and high poverty rates (n1=256, n2=256, n3=256)

Characteristics	Total (n=768) n (%)	low poverty n1 (%)	middle poverty n2 (%)	high poverty n3 (%)
Respondent's age (years)				
< 20	27 (3.5)	11 (4.3)	6 (2.3)	10 (3.9)
20-35	683 (88.9)	219 (85.5)	228 (89.1)	236 (92.2)
>35	58 (7.6)	26 (10.2)	22 (8.6)	10 (3.9)
Number of children				
≤ 2 children	598 (77.9)	206 (80.5)	217 (84.8)	175 (68.4)
≥ 3 children	170 (22.1)	50 (19.5)	39 (15.2)	81 (31.6)
Education level				
Primary school or below	489 (63.7)	180 (70.3)	132 (51.6)	177 (69.1)
Secondary school or above	279 (36.3)	76 (29.7)	124 (48.4)	79 (30.9)
Occupation				
Unemployed	374 (48.7)	122 (47.7)	136 (53.1)	124 (48.4)
Employed	394 (51.3)	134 (52.3)	120 (46.9)	132 (51.6)
Health insurance				
Yes	371 (48.3)	161 (62.9)	98 (38.3)	138 (53.9)
No	397 (51.7)	95 (37.1)	158 (61.7)	118 (46.1)

Disparities in MHS utilization among respondents

This study found disparities in MHS utilization in the provinces with low and middle poverty rates compared to the province with a high poverty rate, which is summarized in Figure 1. Of the 768 respondents, 256 resided in rural areas of each selected province. The utilization of ANC services was much higher in rural areas of provinces with low and middle poverty rates (89.8% and 82%, respectively) compared to the province with a high poverty rate (49.2%). In comparison, the utilization of delivery services was very high in the provinces with low and middle poverty rates (99.6% and 98.8%, respectively) compared to the province with a high poverty rate (76.6%). In addition, the utilization of postpartum follow-up services was much higher in the provinces with low and middle poverty rates (78.9% and 73.8%, respectively) compared to the province with a high poverty rate (44.5%). However, no significant difference was observed in the utilization of family planning services among the three provinces; the utilization was slightly greater in the rural areas of provinces with low and middle poverty rates (77.7% and 78.1%, respectively) compared to the province with a high poverty rate (71.1%) (Figure 1).

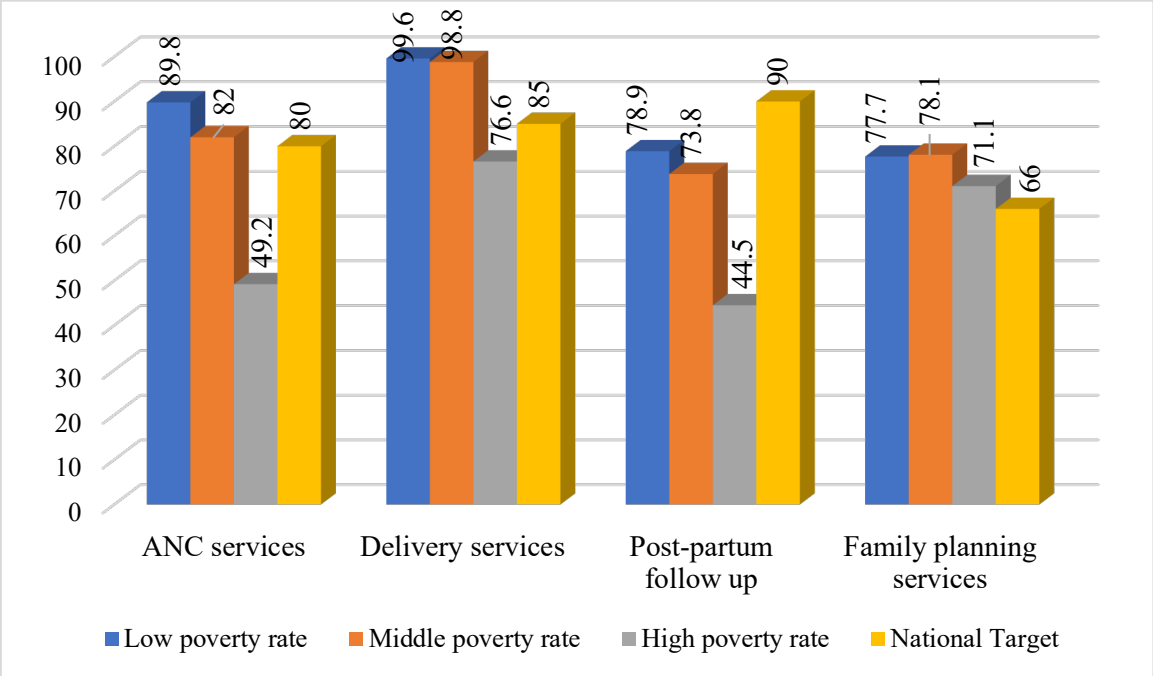

Figure 1 Disparities in utilization of MHS (%) among rural areas of provinces with low, middle, and high poverty rates of Indonesia (n=768)

Factors associated with ANC service utilization among selected provinces

The multivariate analysis of factors related to ANC service utilization is presented in Table 2. Among the three provinces, almost all of respondents (96%) who had health insurance used ANC services at least four times during their most recent pregnancy. The respondents with health insurance were 9.22 times more likely to utilize ANC services than those without health insurance (Adj.OR=9.22, 95% CI 4.95-17.19, p<0.001). Respondents with good knowledge of MHS were 6.39 times more likely to use ANC services than respondents with poor or fair knowledge (Adj.OR=6.39, 95% CI 2.59-15.78, p<0.001). Likewise, respondents having good service availability were 6.27 times more likely to utilize ANC services compared to respondents with poor or fair service availability (Adj.OR=6.27, 95% CI 3.55-11.07, p<0.001). Meanwhile, respondents with good service affordability were 8.81 times more likely to utilize ANC services than respondents with poor or fair affordability (Adj.OR=8.81, 95% CI 5.44-14.26, p<0.001).

Table 2 Multivariable analysis of factors related to ANC service utilization in three provinces

Variables	**Utilization of ANC services**		Adj. OR	95% CI	*p-value*
	Yes	**No**			
	n (%)	**n (%)**			
	566	**202**			
Health insurance					
Yes	356 (96.0)	15 (4.0)	9.22	4.95-17.19	<0.001
No *	210 (52.9)	187 (47.1)			
Knowledge					

Variables	Utilization of ANC services		Adj. OR	95% CI	*p-value*
	Yes	**No**			
	n (%)	**n (%)**			
	566	**202**			
Good	143 (95.3)	7 (4.7)	6.39	2.59-15.78	<0.001
Poor or fair *	423 (68.4)	195 (31.6)			
Availability					
Good	350 (94.3)	21 (5.7)	6.27	3.55-11.07	<0.001
Poor or fair *	216 (54.4)	181 (45.6)			
Affordability					
Good	506 (90.7)	52 (9.3)	8.81	5.44-14.26	<0.001
Poor or fair *	60 (28.6)	150 (71.4)			

**Reference group*

Factors associated with utilization of delivery services among selected provinces

Table 3 provides the analysis of the respondents' utilization of delivery services. The respondents with an education level of secondary school or above were 4.86 times more likely to utilize delivery services than respondents with a primary school education level or below (Adj.OR=4.86, 95% CI 1.09-21.55, p 0.038). Similarly, respondents who had health insurance were 4.83 times more likely to utilize delivery services than those without health insurance (Adj.OR=9.22, 95% CI 4.95-17.19, p<0.001). Respondents with good availability were 3.70 times more likely to use delivery services compared to respondents with poor or fair availability (Adj.OR=3.70, 95% CI 1.04-13.18, p 0.043). Meanwhile, respondents with good affordability were 13.22 times more likely to utilize delivery services than respondents with poor or fair affordability (Adj.OR=13.22, 95% CI 4.43-39.46, p<0.001).

Table 3: Multivariable analysis of factors related to utilization of delivery services (n=768)

Variables	Utilization of Delivery Services		Adj.OR	95% CI	*p-value*
	Yes	**No**			
	n (%)	**n (%)**			
	704	**64**			
Education					
Primary school or below*	427 (87.3)	62 (12.7)			
Secondary school or above	277 (99.3)	2 (0.7)	4.86	1.09-21.55	0.038
Health insurance					
Yes	369 (99.5)	2 (0.5)	4.83	1.05-22.17	0.043
No*	335 (84.4)	62 (15.6)			
Availability					
Good	368 (99.2)	3 (0.8)	3.70	1.04-13.18	0.043
Poor or fair *	336 (84.6)	61 (15.4)			
Affordability					
Good	554 (99.3)	4 (0.7)	13.22	4.43-39.46	<0.001
Poor or fair *	150 (71.4)	60 (28.6)			

**Reference group*

Factors associated with utilization of postpartum follow-up services

Table 4 compares the factors associated with respondents' utilization of postpartum follow-up services. Those respondents who had health insurance were 5.02 times having more likely to use postpartum follow-up services than respondents without health insurance (Adj.OR=5.02, 95% CI 3.19-7.88, p<0.001). The respondents with good MHS knowledge were 2.41 times more likely to use postpartum follow-up services than respondents with poor or fair MHS knowledge (Adj.OR=2.41, 95% CI 1.33-4.39, p0.004). The respondents with good service availability were 3.39 times more likely to utilize postpartum follow-up services compared to respondents with poor or fair service availability (Adj.OR=3.39, 95% CI 2.19-5.25, p<0.001). Additionally, respondents with good service affordability were 5.91 times more likely to use postpartum follow-up than respondents with poor or fair affordability (Adj.OR=5.91, 95% CI 3.73-9.35, p<0.001). Finally, the respondents with good service acceptability were 2.21 times more likely to utilize postpartum follow-up services than respondents with poor or fair acceptability.

Table 4 Multivariable analysis of factors related to utilization of postpartum follow-up services (n=768)

Variables	**Utilization of Postpartum Follow-up Services**		Adj. OR	95% CI	*p-value*
	Yes n (%) 505	No n (%) 263			
Health insurance					
Yes	334 (90.0)	37 (10.0)	5.02	3.19-7.88	<0.001
No*	171 (43.1)	226 (56.9)			
Knowledge					
Good	130 (86.7)	20 (13.3)	2.41	1.33-4.39	0.004
Poor or fair *	375 (60.7)	243 (39.3)			
Availability					
Good	324 (87.3)	47 (12.7)	3.39	2.19-5.25	<0.001
Poor or fair *	181 (45.6)	216 (54.4)			
Affordability					
Good	460 (82.4)	98 (17.6)	5.91	3.73-9.35	<0.001
Poor or fair *	45 (21.4)	165 (78.6)			
Acceptability					
Good	322 (84.3)	60 (15.7)	2.21	1.44-3.40	<0.001
Poor or fair *	183 (47.4)	203 (52.6)			

**Reference group*

Factors associated with utilization of family planning services

The analysis of factors related to respondents' use of family planning services is shown in Table 5. Respondents who had health insurance were 3.62 times more likely to use family planning services compared to respondents without health insurance (Adj.OR=3.62, 95% CI 2.33-5.61, p<0.001). Respondents with good service availability were 2.26 times more likely to utilize family planning services compared to respondents with poor or fair availability (Adj.OR=2.26, 95% CI 1.49-3.42, p<0.001). Furthermore, respondents with good service

affordability were 2.06 times more likely to utilize family planning services than respondents with poor or fair affordability (Adj.OR=2.06, 95% CI 1.37-3.10, p 0.001).

Table 5 Multivariable analysis of factors related to utilization of family planning services (n=768)

Variables	**Utilization of Family Planning Services**		Adj. OR	95% CI	*p-value*
	Yes n (%) 581	No n (%) 187			
Health insurance					
Yes	336 (90.6)	35 (9.4)	3.62	2.33-5.61	<0.001
No*	245 (61.7)	152 (38.3)			
Availability					
Good	326 (87.9)	45 (12.1)	2.26	1.49-3.42	<0.001
Poor or fair *	255 (64.2)	142 (35.8)			
Affordability					
Good	469 (84.1)	89 (15.9)	2.06	1.37-3.10	0.001
Poor or fair *	112 (53.3)	98 (46.7)			

**Reference group*

DISCUSSION

This study found a disparity in the utilization of MHS in rural areas of low, middle, and high poverty rates of Indonesia after analyzing respondents' utilization of ANC services, delivery services, postpartum follow-up services, and family planning services. The utilization of ANC services in the provinces with low and middle poverty rates was much higher (89.8% and 82%, respectively) compared to the province with high poverty rate, where fewer than half of respondents (49.2%) used ANC services, and the utilization was less than the national target of 80%.[35] Factors such as health insurance, knowledge, availability, and affordability were associated with ANC service utilization. Geographically, the high poverty rate province is located in the eastern part of Indonesia, which has numerous islands, mountainous areas, poor road infrastructure, and a lack of health center facilities and doctors.[36] Similarly, previous studies have reported low utilization of ANC services in rural areas of Bangladesh (49%)[37], Myanmar (60%)[38], and Nigeria (62.1%).[39] In comparison, a high level of ANC service utilization has been shown in Tanzania (77.9%)[40] and Malawi (90.5%).[41] Low ANC service utilization may lead to a delay in detecting pregnancy complications and contribute to MMR. In the high poverty rate province, the low ANC service utilization rate, which is below the national target of 80% and significantly lower than the other areas studied, can be a challenge for health care providers seeking to improve MHS utilization to reduce MMR.

This study also found that the utilization of delivery services was very high in rural areas of provinces with low and middle poverty rates (99.6% and 98.8%, respectively), but much lower in the province with a high poverty rate (76.6%), which had a utilization rate below the national target (85%).[35] Further, education, health insurance, availability, and affordability were associated with use of

delivery services. However, the utilization of delivery services in the selected provinces was significantly higher than that reported in previous studies investigating the rural areas of Bangladesh (36.3%)[42], Myanmar (35.6%)[43], Nigeria (46.6%)[39], Western of China (48.9%)[44], West Java Province, Indonesia (55.8%)[45], and in Malawi (71.8%)[41]. In comparison, higher utilization of delivery services was reported in Tanzania (77.6%)[40] and in Shaanxi Province, Western China (85.2%).[46]

This study revealed that the respondents, particularly those in the province with a high poverty rate, used unskilled birth attendants for delivery due to limited and expensive transportation and strong traditional beliefs and culture. However, strong traditional beliefs were not significantly associated with MHS utilization overall. This result may be explained by the performance of the multivariate analysis on the combined data from the three selected provinces. Unskilled birth attendant deliveries are important because of the high risk for maternal death and the resulting difficulty in achieving the goal of reducing global maternal deaths to fewer than 70 per 100,000 live births.[8, 9]

It was observed in this study that the use of postpartum follow-up services was higher in the rural areas of provinces with low and middle poverty rates (78.9% and 73.8%, respectively) and significantly lower (44.5%) in rural areas of the province with a high poverty rate. In all three provinces, the observed utilization rate was much lower than the national target of 90%.[35] Health insurance, knowledge, availability, affordability, and acceptability were associated with the utilization of postpartum follow-up services. The province with a high poverty rate is located in the eastern part of Indonesia, which has limited health center facilities, a lack of medical doctors and laboratories, and poor road infrastructure.[36] In comparison, other studies have revealed minimal utilization of postpartum care in Tanzania (22.2%)[40], Cambodia (26.4%)[47], Myanmar (25%)[43], Western of China (28.42%)[44], and higher utilization in Malawi (58.8%)[41], and India (66%).[48]

The family planning services utilization was slightly higher in rural areas of the provinces with low and middle poverty rates (77.7% and 78.1%, respectively), compared to rural areas of the province with a high poverty rate (77.1%). These results show that the use of family planning services in the selected provinces is greater than the national target of 66%.[35] Factors such as health insurance, availability, and affordability were associated with the utilization of family planning services. For comparison, low postpartum contraception use was reported in Government Hospital Hyderabad Sindh, Pakistan (24.6%)[49], Kailali District of Nepal (38.2%)[50], and in a rural district of Ghana (43%).[51] However, higher utilization of postpartum contraception was found in Adis Ababa, Ethiopia (80.3%)[52]. The use of postpartum contraception is important to ensure the health of mothers and babies[53], to provide sufficient time for subsequent pregnancies, and to limit the number of children.[54] In Indonesia, health workers and volunteers educate communities about family planning services[55]. The development of information communication technology, such as television and the Internet, has also contributed to achieving the national target.[56]

Overall, the low utilization of MHS, particularly in the province with a high poverty rate, may contribute to MMR. In comparison, higher use of MHS has been associated with decreasing MMR.[57] Therefore, increasing the number of hospitals, health centers, and village midwives, and providing additional health insurance coverage may contribute to

improved access to MHS and a decrease in MMR.[58]

STUDY LIMITATIONS

The respondents in this study were mothers with children younger than one year old, and therefore, some respondents may have had some difficulties recalling their previous utilization of MHS. This study employed a cross-sectional review of data; therefore, causal relationships could not be inferred.

CONCLUSION

Disparities in MHS utilization were found in this study. The utilization of ANC, delivery, and postpartum follow-up services was high in rural areas of Indonesian provinces with low and middle poverty rates, but low in the rural areas of the province with a high poverty rate. Similarly, utilization of family planning services was slightly lower in rural areas of the province with a high poverty rate compared to provinces with low and middle poverty rates, although utilization in all provinces was higher than the national target. The factors of health insurance, knowledge, availability, and affordability were associated with the utilization of ANC services, while education, health insurance, availability, and affordability were associated with the utilization of delivery services. Health insurance, knowledge, availability, affordability, and acceptability were associated with postpartum follow-up services. Additionally, health insurance, availability, and affordability were associated with the utilization of family planning services.

The increased utilization of MHS in rural areas of provinces with low and middle poverty rates is a positive indication of Indonesia's prospects for achieving SDGs targets. Furthermore, improving utilization of ANC, delivery, and postpartum follow-up services among rural areas of the province with a high poverty rate should be a national priority, with strong MHS strategies and policies to support programs to expand universal health care coverage and MHS availability and affordability.

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