

Socioeconomic Inequalities in Health Facility Delivery among Married Women in Indonesia

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ABSTRACT

Background: Facility-based childbirth is a key strategy for reducing maternal and neonatal mortality rates. Despite improvements in maternal health services, disparities in the utilization of health facilities for childbirth remain a significant public health issue in Indonesia. **Objective:** This study aimed to identify factors associated with the use of health facilities for childbirth in Indonesia. **Methods:** A cross-sectional study design was employed using secondary data from the 2017 Indonesia Demographic and Health Survey. A total of 14,094 married women aged 15–49 years with complete data were included in the study. Binary logistic regression analysis was used to identify factors associated with the utilization of health facilities for childbirth. **Results:** Women with higher levels of education, adequate antenatal care (ANC) visits, health insurance coverage, and higher socioeconomic status were more likely to give birth in health facilities. Conversely, women living in rural and underdeveloped areas were less likely to use health facilities for childbirth. Wealth status was the strongest predictor; women in the wealthiest quintile were six times more likely to give birth in a health facility (AOR = 6.13; 95% CI: 4.79–7.85). **Conclusion:** socioeconomic disparities, healthcare accessibility, and the utilization of maternal health services significantly influence facility-based childbirth among married women in Indonesia. Increasing the availability of health facilities in underdeveloped areas, particularly in rural regions, would encourage mothers to give birth in health facilities.

Keywords: health facility delivery, childbirth, women living in rural .

Background

Maternal mortality remains a major global public health challenge, particularly in low- and middle-income countries (LMICs) (1)(2). Although the global maternal mortality ratio declined from 342 to 223 deaths per 100,000 live births between 2000 and 2020, approximately 95% of maternal deaths still occur in developing countries (3)(4). Furthermore, Indonesia continues to experience a relatively high maternal mortality burden compared with other Southeast Asian countries, with an estimated maternal mortality ratio of 189 deaths per 100,000 live births in 2020 (1)(5). Therefore, increasing delivery assisted by skilled health personnel in healthcare facilities has become one of the key strategies to reduce maternal mortality because institutional delivery can minimize delays in obstetric management and improve maternal and neonatal outcomes (3)(4). In addition, institutional delivery and skilled birth attendance have been recognized as essential interventions for preventing maternal and neonatal deaths in LMICs (4)(6). Similarly, facility-based delivery services substantially contribute to reducing childbirth-related complications and maternal mortality through timely access to emergency obstetric care and professional maternal healthcare service (1)(7).

Despite improvements in maternal healthcare utilization, inequalities in access to healthcare facility delivery remain substantial in Indonesia (8)(9). In particular, women living in rural areas, having lower educational attainment, lacking health insurance coverage, and belonging to economically disadvantaged households are less likely to utilize institutional delivery services (10)(11). Furthermore, urban residence, higher education, adequate antenatal care visits, and better economic status have been identified as important factors associated with increased utilization of healthcare delivery services in Indonesia (9)(11). Similarly, women from middle-to-lower socioeconomic groups tend to avoid healthcare facility delivery because of limited healthcare accessibility and socioeconomic barriers (8)(10). Moreover, disparities in

maternal healthcare access remain pronounced across Indonesian regions, particularly outside the Java–Bali area (8)(9). Therefore, these findings indicate that socioeconomic and geographic inequalities continue to play a significant role in shaping maternal healthcare utilization in Indonesia (8)(11).

Several studies have examined determinants of institutional delivery in Indonesia; however, important research gaps remain (12)(13). Previous Indonesian studies primarily focused on specific subpopulations, including urban poor women, adolescents, and middle-to-lower socioeconomic groups, while many studies did not specifically analyze married women using nationally weighted IDHS data (14)(15). In addition, limited evidence has comprehensively examined demographic, reproductive, socioeconomic, media exposure, healthcare accessibility, and health insurance variables simultaneously within a nationally representative population (12)(13). Moreover, recent evidence regarding the interaction between healthcare accessibility, insurance coverage, and maternal healthcare utilization among married women in Indonesia remains insufficient (14)(15). Furthermore, vulnerable populations experiencing barriers to institutional delivery continue to require greater attention, particularly among socioeconomically disadvantaged communities (2)(14).

This study aimed to analyze factors associated with health facility delivery among married women in Indonesia using nationally representative data from the 2017 Indonesian Demographic and Health Survey (IDHS). In addition, this study offers novelty by specifically focusing on married women, applying weighted DHS analysis to generate nationally representative estimates, and comprehensively examining sociodemographic, reproductive, healthcare utilization, media exposure, health insurance ownership, and healthcare accessibility factors associated with health facility delivery. Furthermore, the findings are expected to provide comprehensive evidence for policymakers in developing targeted maternal health interventions to reduce inequalities in healthcare facility delivery utilization and improve maternal health outcomes in Indonesia.

Methods

This study employed a cross-sectional design using secondary data obtained from the 2017 Indonesian Demographic and Health Survey (IDHS) dataset (IDIR71FL). The IDHS is part of the global Demographic and Health Survey (DHS) Program, which provides nationally representative data related to population, reproductive health, maternal health, and healthcare utilization. The study aimed to analyze socioeconomic inequalities associated with health facility delivery among married women in Indonesia.

The study utilized nationally representative data collected across all provinces in Indonesia during the 2017 Indonesian Demographic and Health Survey. The population in this study consisted of married women aged 15–49 years who participated in the 2017 IDHS. Respondents who had complete information regarding place of delivery and all study variables were included in the analysis, while respondents with incomplete or missing data were excluded. The IDHS applied a stratified two-stage cluster sampling technique. In the first stage, census blocks were selected systematically from urban and rural strata based on the national population census framework. In the second stage, households were selected systematically from each selected census block. Prior to analysis, sample weighting procedures were applied to account for unequal probability sampling and the complex survey design, thereby ensuring nationally representative estimates. After weighting and data cleaning, the final sample consisted of 14,094 married women.

The dependent variable in this study was place of delivery, categorized into health facility delivery and non-health facility delivery. The independent variables included maternal age, education level, occupation, type of residence, province, wealth index, number of children, age at first birth, number of antenatal care (ANC) visits, frequency of reading newspapers or magazines, frequency of listening to the radio, frequency of watching television, health insurance ownership, and distance to health facilities.

Data were collected by the DHS Program using standardized structured questionnaires administered through face-to-face interviews conducted by trained interviewers. Information regarding sociodemographic characteristics, reproductive history, maternal healthcare utilization, media exposure, health insurance ownership, and healthcare accessibility was obtained from respondents' self-reports during the interview process. The wealth index variable was constructed by the DHS Program using principal component analysis based on household assets and housing characteristics.

Before analysis, sampling weights provided by the DHS dataset were applied to ensure nationally

representative estimates. Descriptive statistics were used to present respondents' characteristics in the form of frequencies and percentages. Bivariate analysis using the chi-square test was conducted to examine associations between independent variables and place of delivery. Furthermore, binary logistic regression analysis was performed to identify factors associated with health facility delivery. The results were presented as crude odds ratios (COR), adjusted odds ratios (AOR), and 95% confidence intervals (CI). Statistical significance was determined at $p < 0.05$.

Results

Table 1 Sociodemographic, Reproductive, and Healthcare Characteristics of Married Women

Variable	Frequency (n)	Percent (%)
Maternal age (years)		
15–24 years	2,583	18.3
25–34 years	7,225	51.3
> 34 years	4,287	30.4
Education Level		
Elementary school or lower	3,788	26.9
Secondary school	8,192	58.1
College and higher	2,114	15.0
Respondent's Current Occupation		
Not Working	7,729	54.8
Working	6,363	45.2
Type of Place Residence		
Urban	6,869	48.7
Rural	7,225	51.3
Province		
Java–Bali	8,067	57.2
Sumatera	3,162	22.4
Kalimantan	870	6.2
Sulawesi	955	6.8
Eastern Indonesia	1,040	7.4
Wealth Index		
Poorest	2,724	19.3
Poor	2,823	20.0
Middle	2,900	20.6
Richer	2,911	20.7
Richest	2,736	19.4
Number of children		
Less than 2	4,611	32.7
2 or more	9,483	67.3
Age at first birth		
< 20 years	3,929	27.9
20–29 years	9,329	66.2
≥ 30 years	837	5.9
Number of antenatal care (ANC) visits		
Less than 4	1,194	8.5
4 or more	12,900	91.5

Variable	Frequency (n)	Percent (%)
Frequency reading newspaper and magazine		
Not at all	8,734	62.0
Less than once a week	4,153	29.5
At least once a week	1,207	8.6
Frequency listening to radio		
Not at all	8,806	62.5
Less than once a week	3,672	26.1
At least once a week	1,616	11.5
Frequency of watching television		
Not at all	507	3.6
Less than once a week	1,566	11.1
At least once a week	12,021	85.3
Health insurance		
No	5,769	40.9
Yes	8,325	59.1
Distance from health facility		
Big problem	1,563	11.1
Not a big problem	12,531	88.9
Place of delivery		
Not health facility	2,710	11.1
Health facility	12,531	88.9

Table 1 presents the characteristics of the 14,094 respondents included in this study. More than half of the mothers were aged 25–34 years (51.3%), while respondents aged 15–24 years accounted for the smallest proportion (18.3%). Most respondents had attained secondary education (58.1%), whereas only 15.0% had completed college or higher education. In terms of employment status, over half of the respondents were not working (54.8%). The distribution of residence was relatively balanced between rural (51.3%) and urban areas (48.7%). Geographically, the majority of respondents were from the Java–Bali region (57.2%), followed by Sumatera (22.4%), while Kalimantan represented the smallest proportion (6.2%). Regarding socioeconomic status, the wealth index was distributed relatively evenly across all quintiles, ranging from 19.3% to 20.7%.

Most respondents had two or more children (67.3%) and reported their first childbirth between the ages of 20–29 years (66.2%). A high proportion of mothers attended at least four antenatal care (ANC) visits during pregnancy (91.5%), indicating substantial utilization of maternal healthcare services. Exposure to mass media showed that the majority of respondents never read newspapers or magazines (62.0%) and never listened to the radio (62.5%). In contrast, television was the most frequently accessed media source, with 85.3% of respondents watching television at least once a week. In terms of healthcare access, more than half of the respondents had health insurance coverage (59.1%). In addition, most mothers reported that distance to health facilities was not a major problem (88.9%). This finding is consistent with the high proportion of deliveries occurring in healthcare facilities (88.9%), compared with deliveries outside healthcare facilities (11.1%).

Table 2. Bivariate Analysis of Factors Associated with Place of Delivery among Married Women

Variable	Relationship between Demographic Characteristics and Place of Delivery		p-value
	No	Yes	
	N (%)		
Maternal age (years)			<0.014
15–24 years	549(3.9)	2,033(14.4)	
25–34 years	1,365(9.7)	5,860(41.6)	
> 34 years	796(5.6)	3,491(24.8)	
Education Level			<0.000
Elementary school or lower	1,289(9.1)	2,499(17.7)	
Secondary school	1,233(8.7)	6,959(49.4)	
College and higher	189(1.3)	1,926(13.7)	
Respondent's Current Occupation			0.059
Not Working	1,530(10.9)	6,199(44.0)	
Working	1,180(8.4)	5,186(36.8)	
Type of Place Residence			<0.000
Urban	573(4.1)	6,297(44.7)	
Rural	2,137(15.2)	5,087(36.1)	
Province			<0.000
Java–Bali	857(6.1)	7,210(51.2)	
Sumatera	895(6.4)	2,267(16.1)	
Kalimantan	309(2.2)	560(4.0)	
Sulawesi	283(2.0)	673(4.8)	
Eastern Indonesia	366(2.6)	674(4.8)	
Wealth Index			<0.000
Poorest	1,222(8.7)	1,502(10.7)	
Poor	652(4.6)	2,171(15.4)	
Middle	452(3.2)	2,448(17.4)	
Richer	286(2.0)	2,626(18.6)	
Richest	98(0.7)	2,638(18.7)	
Number of children			<0.000
Less than 2	722(5.1)	3,889(27.6)	
2 or more	1,988(14.1)	7,495(53.2)	
Age at first birth			<0.000
< 20 years	1,134(8.0)	2,795(19.8)	
20–29 years	1,496(10.6)	7,833(55.6)	
>= 30 years	81(0.6)	756(5.4)	
Number of antenatal care (ANC) visits			<0.000
Less than 4	612(4.3)	582(4.1)	
4 or more	2,097(14.9)	10,803(76.6)	
Frequency reading newspaper and magazine			<0.000
Not at all	1,894(13.4)	6,840(48.5)	

Variable	Relationship between Demographic Characteristics and Place of Delivery		p-value
	No	Yes	
	N (%)		
Less than once a week	729(5.2)	3,425(24.3)	<0.000
At least once a week	87(0.6)	1,119(7.9)	
Frequency listening to radio			
Not at all	1,852(13.1)	6,954(49.3)	<0.000
Less than once a week	644(4.6)	3,029(21.5)	
At least once a week	215(1.5)	1,402(9.9)	
Frequency of watching television			<0.000
Not at all	233(1.7)	274(1.9)	
Less than once a week	361(2.6)	1,205(8.5)	
At least once a week	2,116(15.0)	9,905(70.3)	<0.000
Health insurance			
No	1342(9.5)	4,428(31.4)	<0.000
Yes	1,368(9.7)	6,957(49.4)	
Distance from health facility			<0.000
Big problem	484(3.4)	1,079 (7.7)	
Not a big problem	2,226(15.8)	10,305(73.1)	

Note: p-values were obtained using the chi-square test. Statistical significance was set at $p < 0.05$.

Table 2 demonstrates the association between respondents' demographic characteristics and place of delivery. The bivariate analysis revealed that almost all independent variables were significantly associated with place of delivery ($p < 0.05$), except for respondents' current occupation ($p = 0.059$). Maternal age showed a significant relationship with delivery location ($p = 0.014$). Mothers aged 25–34 years constituted the largest proportion of deliveries occurring in health facilities (41.6%), followed by those aged > 34 years (24.8%). Educational attainment was also significantly associated with place of delivery ($p < 0.001$). Women with secondary education accounted for nearly half of all facility-based deliveries (49.4%), while mothers with college or higher education had the lowest proportion of non-facility deliveries (1.3%).

A significant difference was observed between urban and rural residents ($p < 0.001$). Women living in urban areas were more likely to deliver in health facilities (44.7%) than those residing in rural areas (36.1%). Similarly, regional variation was identified across provinces ($p < 0.001$), with respondents from Java–Bali representing the highest proportion of health facility deliveries (51.2%). Socioeconomic status was strongly associated with place of delivery ($p < 0.001$). The proportion of deliveries in health facilities increased progressively across wealth categories, from 10.7% among the poorest respondents to 18.7% among the richest respondents. In contrast, non-facility deliveries were more frequently reported among women in the lowest wealth quintile (8.7%).

Parity and age at first birth were also significantly related to delivery location ($p < 0.001$). Mothers with two or more children accounted for a greater proportion of facility-based deliveries (53.2%) compared with mothers who had fewer than two children (27.6%). In addition, women whose first childbirth occurred at 20–29 years contributed the largest proportion of health facility deliveries (55.6%).

Utilization of antenatal care services demonstrated a particularly strong association with place of delivery ($p < 0.001$). Women who attended at least four ANC visits were substantially more likely to deliver in health facilities (76.6%) than those with fewer than four visits (4.1%).

Exposure to mass media, including reading newspapers or magazines, listening to the radio, and watching

television, was significantly associated with delivery location (all $p < 0.001$). Respondents with more frequent exposure to media generally showed higher utilization of health facility delivery services. Notably, women who watched television at least once a week accounted for 70.3% of deliveries occurring in health facilities.

Health insurance ownership and perceived access to healthcare services were likewise significantly associated with place of delivery ($p < 0.001$). Mothers with health insurance were more likely to deliver in health facilities (49.4%) than uninsured mothers (31.4%). Furthermore, women who reported that distance to a health facility was not a major problem had a substantially higher proportion of facility-based deliveries (73.1%) compared with those who perceived distance as a major barrier.

Table 3. Multivariable Logistic Regression Analysis of Factors Associated with Health Facility Delivery among Married Women

Variables	Model 1	Model 2
	COR (95% CI)	AOR(95% CI)
Maternal age (years)		
15–24 years	Reference	Reference
25–34 years	0.84(0.74-0.95)**	0.92(0.79-1.08)
> 34 years	0.97(0.88-1.07)	1.02(0.84-1.23)
Education Level		
Elementary school or lower	Reference	Reference
Secondary school	2.91(2.65-3.18)***	1.76(1.57-1.96)***
College and higher	5.26(4.46-6.20)***	1.61(1.30-1.98)***
Respondent's Current Occupation		
Not Working	Reference	Reference
Working	1.08(0.99-1.18)	0.99(0.90-1.10)
Type of Place Residence		
Urban	Reference	Reference
Rural	0.21(0.1960.23)***	0.47(0.42-0.52)***
Province		
Java–Bali	Reference	Reference
Sumatera	0.30(0.27-0.33)***	0.41(0.36-0.46)***
Kalimantan	0.21(0.18-0.25)***	0.29(0.24-0.34)***
Sulawesi	0.28(0.24-0.33)***	0.45(0.38-0.54)***
Eastern Indonesia	0.21(0.18-0.25)***	0.48(0.40-0.57)***
Wealth Index		
Poorest	Reference	Reference
Poor	2.71(2.41-3.04)***	1.85(1.62-2.10)***
Middle	4.41(3.89-5.00)***	2.29(1.98-2.65)***
Richer	7.48(6.48-8.63)***	2.87(2.43-3.41)***
Richest	21.83(17.61-27.07)***	6.13(4.79-7.85)***
Number of children		
Less than 2	Reference	Reference
2 or more	0.70(0.63-0.76)***	0.93(0.81-1.06)
Age at first birth		
< 20 years	Reference	Reference
20–29 years	2.12(1.94-2.32)***	1.40(1.25-1.56)***
>= 30 years	3.80(2.99-4.82)***	2.43(1.82-3.24)***
Number of antenatal care (ANC) visits		
Less than 4	Reference	Reference

4 or more	5.42(479-6.13)***	2.88(2.50-3.31)***
Frequency reading newspaper and magazine		
Not at all	Reference	Reference
Less than once a week	1.30(1.18-1.43)***	0.93(0.82-1.05)
At least once a week	3.54(2.83-4.43)***	1.40(1.08-1.80)**
Frequency listening to radio		
Not at all	Reference	Reference
Less than once a week	2.01(1.13-1.38)***	1.09(0.96-1.23)
At least once a week	3.18(1.49-2.02)***	1.17(0.93-1.40)
Frequency of watching television		
Not at all	Reference	Reference
Less than once a week	2.84(2.30-3.51)***	1.20(0.93-1.54)
At least once a week	3.98(3.32-4.77)***	1.17(0.94-1.47)
Health insurance		
No	Reference	Reference
Yes	1.54(1.41-1.67)***	1.32(1.20-1.46)***
Distance from health facility		
Big problem	Reference	Reference
Not a big problem	2.07(1.85-2.33)***	1.19(1.04-1.37)*

Note: COR = Crude Odds Ratio; AOR = Adjusted Odds Ratio; CI = Confidence Interval. Reference categories are indicated as “Reference”. Statistical significance was defined as * $p < 0.05$, ** $p < 0.01$, and *** $p < 0.001$. Model 1 presents unadjusted associations, whereas Model 2 presents adjusted associations after controlling for covariates.

Table 3 presents the results of binary logistic regression analysis examining factors associated with delivery in health facilities. Both crude odds ratios (COR) and adjusted odds ratios (AOR) were estimated to identify independent predictors after controlling for potential confounding variables. Educational attainment remained a significant determinant of health facility delivery in the adjusted model. Mothers with secondary education were 1.76 times more likely to deliver in health facilities compared with those who had elementary education or lower (AOR=1.76; 95% CI: 1.57–1.96). Similarly, women with college or higher education demonstrated a 1.61-fold higher likelihood of utilizing health facility delivery services (AOR=1.61; 95% CI: 1.30–1.98). In contrast, maternal age and respondents’ occupation were not significantly associated with place of delivery after adjustment. Place of residence and regional disparities showed strong associations with delivery location. Women living in rural areas had significantly lower odds of delivering in health facilities than those residing in urban areas (AOR=0.47; 95% CI: 0.42–0.52). Likewise, respondents from regions outside Java–Bali consistently demonstrated lower utilization of health facility delivery services. The lowest likelihood was observed among women living in Kalimantan (AOR=0.29; 95% CI: 0.24–0.34), followed by Sumatera (AOR=0.41; 95% CI: 0.36–0.46), Sulawesi (AOR=0.45; 95% CI: 0.38–0.54), and Eastern Indonesia (AOR=0.48; 95% CI: 0.40–0.57).

Socioeconomic status emerged as one of the strongest predictors of facility-based delivery. Compared with women in the poorest wealth quintile, the likelihood of delivering in health facilities increased progressively across higher wealth categories. Mothers in the richest group were more than six times more likely to utilize health facility delivery services (AOR=6.13; 95% CI: 4.79–7.85), indicating a substantial socioeconomic inequality in access to maternal healthcare services.

Age at first birth was also independently associated with place of delivery. Women who had their first childbirth at the age of 20–29 years were 1.40 times more likely to deliver in health facilities (AOR=1.40; 95% CI: 1.25–1.56), while those whose first childbirth occurred at age ≥ 30 years had an even greater likelihood (AOR=2.43; 95% CI: 1.82–3.24), compared with mothers who gave birth before the age of 20 years.

Utilization of antenatal care services demonstrated a robust association with health facility delivery. Mothers who attended four or more ANC visits were nearly three times more likely to deliver in health facilities than those with fewer than four visits (AOR=2.88; 95% CI: 2.50–3.31).

Regarding media exposure, only frequent reading of newspapers or magazines remained statistically significant in the adjusted model. Women who read newspapers or magazines at least once a week had higher odds of delivering in health facilities (AOR=1.40; 95% CI: 1.08–1.80). Meanwhile, exposure to radio and television was no longer significant after controlling for other covariates. Health insurance ownership was positively associated with utilization of health facility delivery services. Mothers covered by health insurance were 1.32 times more likely to deliver in health facilities compared with uninsured women (AOR=1.32; 95% CI: 1.20–1.46). Additionally, respondents who perceived distance to health facilities as not being a major problem had significantly higher odds of facility-based delivery (AOR=1.19; 95% CI: 1.04–1.37).

Discussion

This study identified several important determinants associated with health facility delivery among married women in Indonesia. Specifically, educational attainment, residential location, socioeconomic status, antenatal care utilization, media exposure, health insurance ownership, and healthcare accessibility were found to significantly influence women's decisions to deliver in healthcare facilities. Furthermore, these findings suggest that both socioeconomic and healthcare-related factors play important roles in shaping maternal healthcare utilization among married women in Indonesia (10)(19).

Educational level was identified as a significant determinant of health facility delivery, with women who had secondary and higher education being more likely to utilize healthcare facilities for childbirth compared with those with lower educational attainment. Higher education may improve women's knowledge, health literacy, awareness of pregnancy complications, and autonomy in making maternal healthcare decisions. Conversely, low educational status remains an important barrier to institutional delivery utilization among women in low- and middle-income countries (18)(20).

The present study revealed significant urban–rural disparities in health facility delivery, with women living in rural areas being less likely to utilize healthcare facilities for childbirth compared with urban women. Women residing in rural areas had lower odds of delivering in healthcare facilities compared with those living in urban settings (9)(21). This disparity may be related to unequal healthcare distribution, transportation barriers, shortages of skilled health workers, and limited access to emergency obstetric care in rural communities (19)(21). Therefore, improving equitable access to maternal healthcare services in remote and underserved areas remains essential to increasing institutional delivery utilization in Indonesia (19)(21).

Regional inequality was another important issue identified in this study. Women living outside the Java–Bali region were less likely to utilize health facility delivery services compared with those residing in Java–Bali (8)(22). This condition may be influenced by differences in infrastructure development, availability of healthcare workers, and healthcare financing across provinces (7)(22). In addition, maternal healthcare services in Indonesia remain largely concentrated in the Java–Bali region, whereas eastern regions continue to experience shortages of healthcare resources and limited healthcare accessibility (8). Similarly, women living in disadvantaged and rural regions in low- and middle-income countries consistently demonstrate lower utilization of institutional delivery services because of structural inequalities in healthcare access (7). Therefore, these findings indicate that regional disparities remain a major challenge in achieving equitable maternal healthcare utilization in Indonesia (8).

Socioeconomic status emerged as one of the strongest determinants of healthcare facility delivery. Women in the richest wealth quintile were substantially more likely to deliver in healthcare facilities compared with those in the poorest group (14)(20). This finding may be explained by the fact that economic status influences women's ability to afford transportation costs, accommodation, and other indirect healthcare-related expenses (20). In addition, poverty has been recognized as a major risk factor for home delivery because economically disadvantaged women frequently encounter financial barriers when accessing healthcare services (14)(20). Similarly, poor women in Indonesia are more likely to experience non-institutional delivery due to limited healthcare affordability and inadequate healthcare accessibility (12)(14). Therefore, these findings indicate that financial protection policies remain essential

for improving maternal healthcare utilization among vulnerable populations (20).

Age at first birth was significantly associated with healthcare facility delivery. Women who experienced their first childbirth at older ages were more likely to utilize healthcare facilities during delivery compared with younger mothers. This finding may indicate that older maternal age is associated with greater psychological readiness, maturity, and autonomy in making healthcare decisions (19)(22). In addition, younger mothers often have more limited reproductive health knowledge and lower healthcare-seeking behavior compared with older women (15)(23). Furthermore, younger mothers may rely more heavily on family members when making decisions regarding childbirth practices and maternal healthcare utilization (19)(22). Therefore, maternal age at first birth appears to play an important role in influencing women's decisions to utilize healthcare facilities for delivery (23).

Antenatal care utilization showed a strong association with health facility delivery. Women who attended at least four ANC visits were significantly more likely to deliver in healthcare facilities compared with those with fewer ANC visits (9)(18). This association may occur because ANC visits provide important opportunities for healthcare workers to educate mothers regarding pregnancy danger signs, birth preparedness, and the importance of skilled birth attendance (20)(24). In addition, inadequate ANC attendance has been associated with a higher likelihood of non-institutional delivery among women in low- and middle-income countries (18). Similarly, adequate ANC visits can improve maternal awareness and encourage women to seek institutional delivery services (20).

Media exposure was also associated with healthcare facility delivery, particularly among women who frequently read newspapers or magazines (23). This finding may indicate that access to health information through mass media can increase women's awareness regarding maternal health risks and the availability of healthcare services (19)(23). In addition, women exposed to mass media were more likely to utilize maternal healthcare services, including skilled birth attendance and institutional delivery (23)(24). Furthermore, limited media exposure has been identified as an important factor associated with lower utilization of institutional delivery services among women in developing countries (18)(19). Therefore, strengthening maternal health promotion through mass media may help improve maternal healthcare-seeking behavior and increase the utilization of healthcare facilities for childbirth (24).

Health insurance ownership significantly increased the likelihood of health facility delivery (3)(8). This finding may be explained by the fact that insurance coverage can reduce financial burdens and improve women's access to maternal healthcare services (12). In addition, Indonesia's national health insurance program has contributed to increasing the utilization of maternal health services, including facility-based delivery, particularly among poor and disadvantaged women (8)(12). Similarly, women with health insurance coverage were more likely to utilize skilled birth attendance and institutional delivery services compared with uninsured women. Therefore, these findings emphasize the importance of expanding universal health coverage to improve maternal healthcare utilization and maternal health outcomes in Indonesia (3).

Accessibility to healthcare facilities also played an important role in determining place of delivery (10). Women who perceived distance to healthcare facilities as not being a major problem were more likely to utilize institutional delivery services compared with those experiencing greater accessibility barriers. This condition may be associated with geographic barriers, transportation limitations, and long travel distances that can delay access to emergency obstetric care, particularly in rural and remote areas (19). In addition, women who perceived healthcare access as manageable tended to be more likely to deliver in healthcare facilities because easier access can improve timely utilization of maternal healthcare services. Similarly, distance-related barriers have been recognized as important factors contributing to lower utilization of institutional delivery services among women in low- and middle-income countries (18). Therefore, improving transportation systems and expanding healthcare coverage in remote areas may help reduce inequalities in maternal healthcare access and increase the utilization of healthcare facility delivery services (10).

This study has several limitations. First, the cross-sectional design limited the ability to establish causal relationships between the study variables. Second, the use of secondary DHS data restricted the analysis to variables available within the dataset. In addition, the possibility of recall bias could not be completely excluded because several variables were based on respondents' self-reported information. Nevertheless, this study utilized nationally representative data with a large sample size and standardized DHS methodology, thereby strengthening the validity and generalizability of the findings among married

women in Indonesia.

Conclusions and Recommendations

This study demonstrated that educational attainment, place of residence, regional disparities, wealth index, age at first birth, antenatal care (ANC) visits, media exposure, health insurance ownership, and accessibility to healthcare facilities were significantly associated with health facility delivery among married women in Indonesia. Women with higher education, better socioeconomic status, adequate ANC visits, health insurance coverage, and easier access to healthcare services were more likely to deliver in healthcare facilities. In contrast, women living in rural and disadvantaged regions showed lower utilization of institutional delivery services. These findings indicate that socioeconomic inequality and healthcare accessibility remain important challenges in improving maternal healthcare utilization in Indonesia.

The government should strengthen equitable access to maternal healthcare services, particularly in rural and underserved areas, by improving healthcare infrastructure, transportation access, and availability of skilled birth attendants. Efforts to expand health insurance coverage and improve the quality and coverage of antenatal care services are also essential to increase health facility delivery utilization. In addition, maternal health education through community-based programs and mass media campaigns should be enhanced to improve women's awareness regarding the importance of safe delivery in healthcare facilities. Future studies are recommended to explore cultural, behavioral, and healthcare system factors influencing institutional delivery utilization in Indonesia.

Ethical Consideration and Competing Interest

This study used secondary data obtained from the Demographic and Health Survey (DHS) Program after receiving official permission to access and use the dataset. The Institutional Review Board (IRB) approved the initial IDHS survey through the ICF IRB Review Board (FWA00000845). All respondents provided informed consent before participating in the original survey, and the dataset used in this study was anonymized to maintain respondents' confidentiality and privacy.

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