Since 2002

Delivery Services Utilization Based on Urban Rural Status in Indonesia

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Abstract

BACKGROUND: Maternal mortality has been listed in the Sustainable Development Goals' priority. Hence, use of delivery services from health facilities is essential to improve maternal and child health.

AIM: This study aimed to analyze the trends and determinants of skilled delivery service utilization between urban and rural areas in Indonesia.

METHODS: This quantitative study uses a cross-sectional design. The secondary data source came from the Indonesian Health Demographic Survey in 2007–2017. As many as, 29,985 married women of childbearing age (15–49 years old) were selected as samples. The data analysis was done using the Chi-square test then binary logistic regression test.

RESULTS: Trends in the utilization of health facility delivery services increased in Indonesia. Age, residential area, education level, occupational status, antenatal visits and knowledge of danger signs during pregnancy, and economic status were associated with the utilization of health facility delivery services both in the rural and urban areas. Women who finished college had 4.55 times chances of using health facility delivery services.

CONCLUSION: Demographic characteristics, antenatal visits, and knowledge of danger signs during pregnancy are associated with use of health facility delivery service sin rural and urban areas. The government needs to consider these factors in reducing in equal use of health facility delivery services between urban and rural areas.

Introduction

Maternal mortality, a priority in the Sustainable Development Goals agenda, was progressively reduced in 2000–2017 from 342 deaths to 211 deaths per 100,000 live births worldwide. However, this number does not align with the global target of 70 maternal mortality per 100,000 live births by 2030 [1]. Most maternal deaths occur due to preventable factors [2]. Sub-Saharan Africa and South Asia accounted for about 86% of maternal deaths globally in 2017 [3], indicating the high number of maternal deaths in developing countries [4].

The utilization of health facility delivery services may essentially prevent unwanted events during labor. Data show that the proportion of health facility delivery in women aged 10–54 reached 79.3% in Indonesia which met the 2018 target plan. Thirteen provinces were identified to have met the target with uneven distribution of success and a great discrepancy from the remaining provinces [5].

The previous studies have explored about the utilization of health facility delivery services to improve maternal and child health research in six African countries found maternal and infant mortality and pain rates were lower due to using health facility delivery services. Health facility has sterile medical equipment for safe and ready use in addition to providing a special maternal room [6]. Assistance from skilled health workers may improve maternal health and safety [7].

Factors associated with the utilization of health services for delivery include educational and socioeconomic factors such as distance to health facilities, high costs, family decision-making, and quality of care [8]. The previous studies have explored factors associated with the utilization of health facility delivery services. However, few studies explore the discrepancies in trends and determinants of utilization of health facility delivery services between rural and urban areas. Therefore, this current study analyzed the topic to fill the gap between the existing researches. This study aimed to analyze the trends and determinants of skilled delivery service utilization between urban and rural areas in Indonesia.

Methods

This quantitative study used a cross-sectional design with a non-experimental method. Secondary

data from the Indonesian Health Demographic Survey (IDHS) in 2007, 2012, and 2017 were used. The international Demographic and Health Survey (DHS) program conducted with the Indonesian Statistics, the National Population and Family Planning Agency, and the Ministry of Health. The DHS provides an overview of the current conditions regarding, family planning, reproductive health, and maternal and child health in Indonesia thoroughly and gathers information on socio-economic background, fertility, contraception, pregnancy and postnatal examination, childhood immunization, child health and nutrition, marriage, and other health issues. The IDHS provides the latest estimates of demographic and health indicators among women aged 15–49 years, married men aged 15–54 years, and adolescent men aged 15–24 years [9].

Data were collected through interviews and questionnaires containing questions addressed to married women of childbearing age. The women in reproductive age and household questionnaire address use of contraception, respondents' background, and the fertility preferences section. All data used were accessed on http://sdki.bkkbn.go.id/files/buku/IDHS.pdf. The target population in the study was all married women of childbearing age (15–49 years old) in 34 provinces. Only 29,985 women met the inclusion criteria: Age of 15–49 years, being married, and undergoing delivery.

The analysis was conducted based on Andersen's behavioral model of the utilization of health services between rural and urban areas [10]. Delivery service utilization as a dependent variable is divided into two categories: Skilled delivery assistance by health workers (doctors, nurses, midwives, and obstetricians) and without assistance from health workers (shamans and other witch doctors). Seven independent variables in this study include age, region, level of education, occupation status, economic status, antenatal care (ANC) visits, and knowledge about pregnancy danger signs. Age is divided into three categories: 35–49, 25–34, and 15–24 years, and ANC visits are divided into completeness and incompleteness of pregnancy check-ups. Region is categorized into three groups: Sumatra, Java/Bali, and the eastern region (Sulawesi, NNT, Papua, and Kalimantan). Education level consists of low level (no formal education, elementary school dropout, and elementary school graduate), intermediate level (high school and senior high school), and high level (university degree). In addition, employment status is categorized as employed and unemployed. Economic status is determined based on the wealth index, a composite measure of household's cumulative living standard calculated from household ownership of selected assets, such as television and bicyles, housing materials, and types of access to water and sanitation facilities. Wealth index is divided based on quintile including very rich (quintile 5), rich (quintile 4), middle (quintile 3), poor (quintile 2), and very poor (quintile 1). Categories for knowledge about pregnancy danger signs include being

aware and unaware of the signs.

Univariate, bivariate, and multivariate were conducted by stages. First, the univariate analysis aimed to describe the characteristics of the variables. Bivariate analysis was then used to see associations between two variables using the chi-square test. Associations of the indicator variables on the outcome variables were measured through multivariate logistic regression analysis with odds ratio and 95 Confidence Interval computed. Data cleaning and management were carried out using SPSS 23.

Results

A total of 29,985 respondent from 2007, 2012, and 2017 DHS data were included in this study. Figure 1 illustrates the overall trends in utilization of health facility delivery services in Indonesia. It reveals that the proportion of health facility delivery services differed each year at 53.8% in 2007, 68.8% in 2012, and 77.9% in 2017.
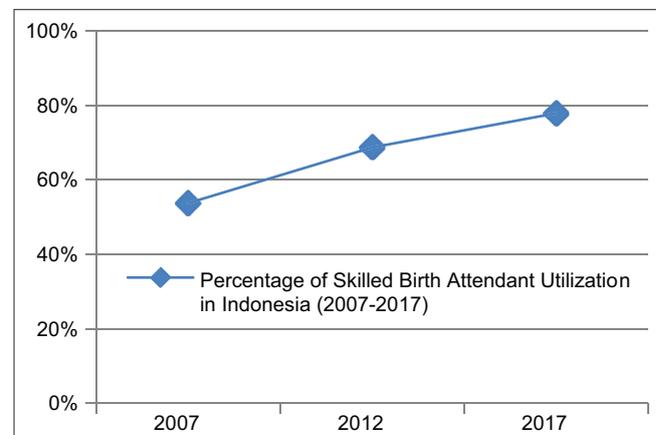

Figure 1: Trends in utilization of health facility delivery services in Indonesia (2007–2017)

As shown in Figure 2, most of the delivery services were performed by midwives, and few were handled by doctors. The percentage of delivery services
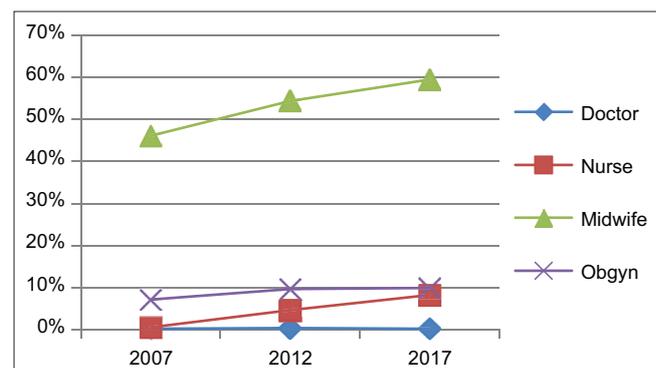

Figure 2: Trend in delivery services by types of health workers in in Indonesia (2007–2017)

Table 1: Respondents' characteristics

Characteristics	Urban (n = 13.639)		Rural (n = 16.346)	
	n	%	n	%
Age				
35–49	4.007	29.4	4.241	25.9
25–34	7.227	53.0	8.074	49.4
15–24	2.405	17.6	4.031	24.7
Region				
Sumatera	2.239	16.4	4.200	25.7
Java/Bali	9.496	69.6	7.649	46.8
Eastern region	1.904	14.0	4.497	27.5
Level of education				
College	2.265	16.6	1.165	7.1
Secondary education	8.233	60.4	7.759	47.5
Primary education	3.141	23.0	7.422	45.4
Occupation Status				
Employed	6.753	49.5	8.336	51.0
Not working	6.886	50.5	8.010	49.0
Economic Status				
Highest	3.633	26.6	2.142	13.1
High	3.293	24.1	2.685	16.4
Middle	2.772	20.4	3.386	20.7
Low	2.194	16.1	3.751	23.0
Lowest	1.747	12.8	4.382	26.8
ANC Visits				
Complete	12.789	93.8	14.216	87.0
Not complete	850	6.2	2.130	13.0
Knowledge of Pregnancy Danger Signs				
Yes	9.087	66.6	8.596	52.6
No	4.552	33.4	7.750	47.4

by midwives was at 46.1% in 2007 which increased to 59.5% in 2017. While, the proportion of delivery services by doctors reached 0.3% in 2007 which decreased to 0.2% in 2017.

Table 1 explains more than half of the women (53%) were in the 25–34 age group and lived in urban areas. Almost half of the women living in rural areas (49.5%) were 25–34 years old. Most of the respondents lived in urban (69.6%) and rural areas (46.8%) of Java/Bali regions. Respondents who completed their secondary education level mostly came from urban areas (60.4%) compared to rural areas (47.5%). Nearly half of the women worked in urban areas (49.5%) while more than half (51%) had a job in rural areas. Some of the richest women (26.6%) lived in urban areas, and some of the poorest (26.8%) lived in rural areas. Regarding ANC, most of the women who lived in urban areas completed their ANC visits (93.8%) while most of the respondents in rural areas did too (87%). More than half of them who lived in urban areas (66.6%) and rural areas (52.6%) knew pregnancy danger signs.

Table 2 presented the different Chi-square test results on determinant factors affected health worker delivery assistance in the urban and rural areas. The result revealed a significant relationship, with a p-value of 0.05, between all the determinant factors including age, residential region, level of education, occupational status, antenatal visits and knowledge of danger signs during pregnancy, and economic status, with the utilization of health worker delivery assistance both in the rural and urban area.

A binary logistic regression test was carried out to examine determinant factors that contribute to utilization of health facility delivery services. It showed that the older the women, the more likely for them to use health facility delivery services. As presented in Table 3, age is significantly associated with the utilization of health facility delivery services in urban areas. While

Table 2: Association of independent variable with utilization of health facility delivery service between urban and rural areas in Indonesia

Variable	Utilization in urban		p-value	Utilization in rural		p-value
	Yes (%)	No (%)		Yes (%)	No (%)	
Age						
35–49	82.1	17.9	0.000	58.1	41.9	0.002
25–34	78.3	21.7	0.000	57.0	43.0	0.010
15–24	71.9	28.1	Ref	52.9	47.1	Ref
Region						
Sumatera	84.7	15.3	0.000	62.0	38.0	0.000
Java/Bali	78.0	22.0	0.000	57.7	42.3	0.000
Eastern region	72.0	28.0	Ref	48.4	51.6	Ref
Education level						
College	90.2	9.8	0.000	82.5	17.5	0.000
Secondary education	81.2	18.8	0.000	66.5	33.5	0.000
Primary education	62.1	37.9	Ref	41.4	58.6	Ref
Occupation status						
Employed	81.2	18.8	0.000	55.4	44.6	0.199
Unemployed	75.4	24.6	Ref	57.1	42.9	Ref
Economic status						
Highest	84.9	15.1	0.000	81.4	18.6	0.000
High	78.9	21.1	0.000	69.3	30.7	0.000
Middle	76.8	23.2	0.003	61.5	38.5	0.000
Low	74.8	25.2	0.015	50.6	49.4	0.000
Lowest	70.0	30.0	Ref	36.7	63.3	Ref
ANC Visits						
Complete	79.3	20.7	0.000	59.5	40.5	0.000
Not complete	62.1	37.9	Ref	34.5	65.5	Ref
Knowledge about pregnancy danger signs						
Yes	80.4	19.6	0.000	64.2	35.8	0.000
No	74.1	25.9	Ref	47.5	52.5	Ref

for women from rural areas, age (25–34 years old) has no correlation with the use of that service.

Regarding regions, women living in urban and rural areas of Java/Bali and Sumatera regions were more likely to labor in health facilities than those living in the Eastern regions. Women who finished college had 4.55 times chances of using health facility delivery services than those who finished primary education in urban areas, in line to rural areas; women who finished college had 3.25 times chances of using health facility delivery services than those who finished primary education in rural areas. Likewise, the educational level of women in rural areas is also statistically significant with health facility delivery assistance.

Table 3: Determinates factor of health facility delivery service utilization between urban and rural areas in Indonesia

Variable	Urban		Rural	
	p-value	OR (95% CI)	p-value	OR (95% CI)
Age				
35–49	0.000	1.820 (1.494–2.218)	0.000	1.375 (1.188–1.591)
25–34	0.009	1.256 (1.057–1.491)	0.226	1.086 (0.950–1.242)
15–24	Ref		Ref	
Region				
Sumatera	0.000	2.058 (1.675–2.529)	0.000	1.517 (1.308–1.759)
Java/Bali	0.002	1.373 (1.126–1.673)	0.747	1.029 (0.866–1.222)
Eastern region	Ref		Ref	
Education Level				
College	0.000	4.559 (3.474–5.983)	0.000	3.255 (2.592–4.088)
Secondary education	0.000	2.552 (2.159–3.017)	0.000	2.095 (1.851–2.370)
Primary education	Ref		Ref	
Occupation status				
Employed	0.018	1.166 (1.027–1.323)	0.048	0.895 (0.801–0.999)
Unemployed	Ref		Ref	
Economic status				
Highest	0.106	1.237 (0.956–1.6010)	0.000	3.995 (3.186–5.009)
High	0.686	1.054 (0.818–1.358)	0.000	2.568 (2.110–3.125)
Middle	0.383	1.109 (0.879–1.397)	0.000	2.068 (1.754–2.437)
Low	0.710	1.039 (0.851–1.268)	0.000	1.479 (1.281–1.708)
Lowest	Ref		Ref	
ANC Visits				
Complete	0.001	1.731 (1.268–2.364)	0.000	2.054 (1.788–2.359)
Not Complete	Ref		Ref	
Knows the sign of danger during pregnancy				
Yes	0.510	1.051 (0.907–1.218)	0.000	1.310 (1.170–1.467)
No	Ref		Ref	

OR: Odds ratio, CI: Confidence interval.

Table 3 presents a statistically significant association between woman's occupational status and the utilization of health facility delivery services. While in urban areas, working women had 1.16 times chances of using health facility delivery services than those not working. In contrast, the results revealed that women who lived in rural areas had 11.5% lower probability of using health facility delivery services than those not working. The higher the wealth per quintile, the more likely for women in urban and rural areas to use the service. Women in rural areas had statistically significant association between income and use of health facility delivery services in rural areas while not in urban areas.

The likelihood of receiving health facility services during delivery was 1.73 and 2.054 times higher for women in urban and rural areas, respectively, who completed ANC visits than women who did not complete their ANC visits. Moreover, women who knew the sign of danger during pregnancy had 1.31 times chances of using health facility services during delivery than those with inadequate knowledge.

Discussion

This study identified essential factors which influence the utilization of health facility delivery service between rural and urban areas in Indonesia. The factors include age, region of residence, educational level, occupational and economic status, completeness of ANC visits, and knowledge about pregnancy danger signs. Women with younger age are more likely to give birth in health facilities than older women [11], [12]. However, this current study found older age tends to contribute to more possibilities of using health facility delivery services in both urban and rural areas even though there is no significant association between age of 25–34 years and the utilization of health facility delivery service in rural areas. In addition, similar findings in Ethiopia reported by Fekadu [13] indicate a positive relationship between women's age and the assistance of skilled birth attendants in urban areas, but rural areas. Maternal awareness of high-risk age pregnancies and high antenatal visit completeness among women in rural areas might affect the results. Therefore, it highlights the importance of health counseling during ANC visits to increase women's knowledge and awareness of safe pregnancy and delivery service by health worker.

Geographical condition somehow constraints the government to provide equitable health services while equal distributions of health workers are essential to ensure the accessibility to them [14]. Despite the increasing utilization of health facility delivery services, health disparities still occur between regions [15]. This study revealed that the utilization of health facility delivery services varied by regions. Women who lived in rural and urban areas of Java/Bali and Sumatera regions were more likely to give birth by health worker's help than those in the Eastern region. Moreover, a previous study has indicated that women who resided in the Eastern region, including Maluku Island, Western New Guinea, Kalimantan, and Sulawesi are less likely to have safe delivery service than those in the Sumatera region [16]. Regardless of equal distribution of health workers, the decision about delivery may be influenced by distance, poor roads, and cost and lack of transport [17]. Moreover, social and cultural factors also likely influence where women give birth. In an extended family, mother's or grandmother's pregnant women make decision for a delivery place. In contrast, a smaller family gives pregnant women's right to choose [18].

Furthermore, this study indicated a significant association between educational level and utilization of health facility delivery services. The higher women's education, the more likely to use health facility delivery services. This probability was higher in urban areas than in rural areas. Similarly, the previous studies report women who achieved a secondary education or above are more likely to use institutional delivery services than non-educated women [17], [19], [20]. Education can be a proxy for information and knowledge of health services [13], such as where and how individuals access the best health care [21]. Therefore, it may improve women's status and their capability to make decisions on utilization of maternal health services [22].

Economic status also contributed to the utilization of health facility. Higher economic status per quintile of women contributes to decision on utilizing health facility delivery services among women living in urban and rural areas. These results were statistically significant in rural areas and inversely insignificant in urban areas. Similar findings from previous studies reveal women in the richest quintile have higher likelihood of using health facility delivery services [12], [22], [23], [24]. Hence, prosperous women likely have better access to adequate ANC [25].

Working women were positively associated with the utilization of health facility delivery services in urban areas. Women who have good composite labor force participation are more likely to deliver in a health facility by health professional's assistance [12]. In contrast to the previous study, women's occupation is not a significant predictor in influencing the utilization of health facility services [13]. Working mothers who lived in rural areas did not contribute to seek for health worker's help for their delivery. A previous study affirms that working mothers are less likely to give birth in healthcare facilities than non-working mothers [23] possibly because they earn little income to fund the service fees in rural areas.

Knowledge about pregnancy danger signs seems to influence the utilization of health facility services. The main reason for selecting qualified delivery services may be to reduce fear of complications [22] and to improve awareness of the dangers of unscientific

delivery methods [20]. Therefore, the mothers' knowledge about pregnancy and delivery services and complications seems significantly to be associated with the utilization of health facility delivery services [11].

This study also discovered that antenatal visit completeness positively contributed to the utilization of health facility delivery services among women in urban and rural areas. The previous studies also discovered similar findings [11], [19], [24] as information sharing during ANC visits [21] about safe health facility delivery services [22]. In addition, the quality of ANC, for example, positive attitude of health workers affect women satisfaction with health service [26]. Therefore, completeness of antenatal visits is essential for pregnant women to have a clearer picture about safe health facility delivery services.

Conclusion

Trends in utilization of health facility delivery services in Indonesia increased. Demographic characteristics, antenatal visits, and knowledge about pregnancy danger signs seem to be associated with the utilization of the services. The government needs to consider these factors in reducing in equal utilization of health facility delivery services among women in urban and rural areas.

Ethical Consideration

Ethical issues (including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely addressed by the authors.

Acknowledgment

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