

Original Research Report

Factors Associated with the Use of Skilled Birth Attendants in Indonesia

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Abstract: The maternal mortality rate in Indonesia of 305/100,000 live births is still far from the SDGs target in the year 2030, which is 70/100,000 live births. The WHO states that the main causes of maternal mortality are bleeding, infection, preeclampsia-eclampsia, complications of childbirth, and unsafe abortion. This can be prevented if the mother can access health services, especially the use of skilled birth attendants to overcome complications of pregnancy and childbirth. This study aims to determine the factors associated with the use of skilled birth attendants in Indonesia. This cross-sectional study with a total sample of 4,543 women aged 15-49 years who gave birth to the last child selected in a sample of secondary data Indonesia Demographic Health Survey (IDHS) 2017. The dependent variable of the study was a skilled birth attendants and the independent variable was sociodemographic factors (age, education, employment, area of residence), antenatal factors (antenatal care examiner, antenatal place, antenatal frequency), medical factors (pregnancy complications and birth complications). The results of this study indicate that the dominant factor in the selection of skilled birth attendants is pregnancy examiners. Pregnancy examiners who examine the pregnancy by an obstetrician have the opportunity to choose a permanent delivery at an obstetrician, which is 8.33 (95% CI 6.75 – 10.29) times compared to choosing a midwife after being controlled by other variables.

Keywords: Antenatal Care, Childbirth, Health Facilities, Skilled Birth Attendants.



1. Introduction

Maternal morbidity and mortality are one of the world's health problems [1]. An estimated 287,000 maternal mortalities occurred worldwide in 2010 and most of them were in developing countries. The maternal mortality rate in Indonesia of 305/100,000 live births is still far from the 2030 SDGs target of 70/100,000 live births [2]. The WHO states that the main causes of maternal mortality are bleeding, infection, preeclampsia-eclampsia, complications of childbirth, and unsafe abortion [3]. This can be prevented if the mother can access health services to deal with complications of pregnancy and childbirth. The high maternal mortality rate is directly related to the low quality of maternal health services [4].

Maternal health is the key to the health of future generations. Women who are healthy during pregnancy and are safe until delivery will generally give birth to healthy babies. Therefore, maternal morbidity and mortality is an important indicator to describe maternal health status [5]. The causes of maternal mortality in Indonesia are grouped into direct and indirect causes. Causes directly related to obstetric diseases during pregnancy such as bleeding (32%), high blood pressure (25%), infection (5%), prolonged labor (5%), and abortion (1%) while the rest (32%) were other causes. Such as non-obstetric diseases. These direct causes can be prevented by ensuring that all pregnant women can access quality health services from pregnancy to delivery [6].

Pregnancy is a period of normal physiological changes in the body during pregnancy, childbirth, and the postpartum period. However, this condition sometimes occurs complications that can affect the living conditions of the mother and baby which contribute to the increase in maternal morbidity and mortality [7]. The utilization of maternity services in health facilities in Indonesia increased from 20.9% in 1991 to 46.6% in 2007 [8]. The 2017 IDHS report stated that deliveries in health facilities increased from 56% in 2012 to 74% in 2017. Meanwhile, the coverage of skilled birth attendants in Indonesia in 2017 increased from 83% in 2012 to 91% in 2017 [9]. The Indonesian Ministry of Health targets to increase the coverage of deliveries in health facilities to reach 95% by 2024 [10]. The research conducted in Ethiopia reported that there was a relationship between the area of residence, parity, use of antenatal care, maternal education, age at first pregnancy, decision-makers in the family, and the utilization of delivery services [11]. The research conducted in Tanzania states that maternal empowerment has a role in decision-making on the selection of skilled birth attendants. Deliveries assisted by a trained personnel have been shown to increase the survival of women and babies [12]. Delivery with skilled birth attendant is defined as a delivery with the assistance of health workers who have competence according with the law [13]. The research conducted by Wulandari & Zoraya reported that sociodemographic factors such as education, age, parity, area of residence, and economic status are related to the use of skilled birth attendants [14]. The purpose of this study is to find out the factors related to the use of skilled birth attendants in Indonesia to be able to provide input in determining maternal health service policies.

2. Literature Review

Maternal Mortality Rate (MMR) is an indicator to assess the well-being of the people of a country [15]. It is estimated that 90% of maternal mortality is caused by childbirth and the main cause is bleeding. The high mortality rate is related to low health service coverage and a delayed referral system [16]. Maternal mortality can be prevented, among others, by increasing the coverage of antenatal care, increasing deliveries assisted by health workers, increasing the coverage of family planning participants, especially long-term contraception, and empowering families and communities in the health sector [17]. According to WHO, almost 80% of births have been assisted by health workers in the 2012-2017 period. This figure has increased from the previous only 62% in 2000-2005. The increase in the number of deliveries by health workers has contributed to the reduction in maternal mortality is 1990-2015 [18].

Based on a statement between WHO, the International Confederation of Midwives (ICM), and the International Federation of Obstetricians and Gynecologists (FIGO) it is stated that skilled birth attendants are midwives, doctors, or nurses who have undergone education and training to be able to handle normal pregnancy, childbirth, and the postpartum period, as well as being able to identify complications and carry out referral management for mothers and newborns [19]. The 2017 IDHS report stated that births with health personnel were 61% of midwives, 29% of obstetricians, 7% of traditional birth attendants, 1% of general practitioners, and 2% of others [9]. However, deliveries with the help of non-medical personnel or without assistance are still found in Indonesia, namely in Maluku, Papua, and Nusa Tenggara. This happens because access to health services is far away, service prices are not

affordable, facilities are lacking, and the presence of health workers is erratic causing pregnant women and families in the area to choose to give birth with a traditional healer or family and relatives [20]. Delivery with trained health personnel shows a significant difference between the health conditions of the mother and baby during the delivery process if complications occur. Countries that implement policies for deliveries assisted by trained personnel have an impact on reducing maternal mortality. Malaysia and Thailand are among the countries that have succeeded in reducing maternal mortality. The maternal mortality rate in Malaysia decreased from above 500 per 100,000 live births in 1950 to 43 per 100,000 live births in the early 1990s. Meanwhile, Thailand, with a maternal mortality rate of 400 per 100,000 live births in 1960, decreased to 50 per 100,000 live births in 1990 [21].

3. Methods

The study design used a cross-sectional. The population of this study is women of childbearing age (15-49 years) who have given birth to as many as 49,627. The sample of this study was some women of childbearing age (15-49 years) who gave birth to the last child selected in the 2017 IDHS sample as many as 4,543. The inclusion criteria in this study were women who gave birth to their last child included in the 2017 IDHS sample. The exclusion criteria were women who do not have complete data. The independent variables in this study were sociodemographic factors (age, education, employment, area of residence), antenatal factors (antenatal care examiner, antenatal place, antenatal frequency), medical factors (pregnancy complications and birth complications). While the dependent variable is the skilled birth attendants. The analysis in this study is bivariate using chi-square and multivariate analysis using a logistic regression.

4. Result and Discussion

Tabel 1 shows the skilled birth attendant among the study participants by selected socio-demographic characteristics, while Tabel 2 shows determinant of skilled birth attendants.

Tabel 1. Skilled Birth Attendant among the Study Participants

Variable	Midwife		Skilled Birth Attendant		OR	95% CI	P Value
	n	(%)	n	(%)			
Antenatal care							
Examiner							
Midwife	2.657	86,94	399	13,06	Ref		
Obstetrician	468	31,47	1.0	68,53	14,50	12,46 – 16,88	0,000
			19				
Insurance							
No	1.172	76,55	359	23,45	Ref		
Yes	1.953	64,84	1.0	35,16	1,77	1,54 – 2,04	0,000
			59				
Age							
≤ 34	2.224	71,65	880	28,35	Ref		
≥ 35	901	62,62	538	37,39	1,51	1,32 – 1,72	0,000
Parity							
1	878	63,95	495	36,05	Ref		
> 1	2.247	70,88	923	29,12	0,73	0,64 - 0,83	0,000
Education							
No education/primary	842	85,22	146	14,78	Ref		
Secondary	1.864	71,47	744	28,53	2,30	1,89 – 2,80	0,000
Higher	419	44,42	528	55,76	7,27	5,85 – 9,03	0,000
Residence							
Rural	1.697	82,14	369	17,86	Ref		
Urban	1.428	57,65	1.0	42,35	3,38	2,94 – 3,88	0,000
			49				
Employement							

Not employed	1.728	72,24	664	27,76	Ref		
Employed	1.379	64,95	754	35,05	1,40	1,24 – 1,59	0,000
Index of wealth							
Quintile 1 (lowest)	956	89,68	110	10,32	Ref		
Quintile 2 (second)	704	81,01	165	18,99	2,04	1,57 – 2,64	0,000
Quintile 3 (middle)	640	75,92	203	24,08	2,76	2,14 – 3,55	0,000
Quintile 4 (fourth)	510	61,82	315	38,18	5,37	4,21 – 6,84	0,000
Quintile 5 (highest)	315	33,51	625	66,49	17,24	13,57 – 21,91	0,000
Antenatal care frequency							
0-3 times	245	79,80	62	20,20	Ref		
≥ 4 times	2.880	67,99	1.356	32,01	0,27	1,40 – 2,48	0,000
Pregnancy complications							
No	2.682	71,94	1.046	28,06	Ref		
Yes	443	54,36	372	45,64	2,15	1,84 – 2,51	0,000
Birth complications							
No	1.203	75,61	388	24,39	Ref		
Yes	1.922	65,11	1.030	34,89	1,66	1,45 – 1,91	0,000
Antenatal care facilities							
Government	2.377	83,11	483	16,89	Ref		
Private	748	44,44	935	55,56	6,15	5,36 – 7,06	0,000
Birth facilities							
Government	2.132	79,05	565	20,95	Ref		
Private	993	53,79	853	46,21	3,24	2,85 – 3,69	0,000

Tabel 2. Determinant of Skilled Birth Attendants

Variable	Skilled Birth Attendant						P Value
	Midwife		Obstetrician		OR	95% CI	
	n	(%)	n	(%)			
Antenatal care examiner							
Midwife	2.657	86,94	399	13,06	Ref		
Obstetrician	468	31,47	1.019	68,53	8,33	6,75 – 10,29	0,000
Insurance							
No	1.172	76,55	359	23,45	Ref		
Yes	1.953	64,84	1.059	35,16	1,30	1,09 – 1,55	0,004
Age							
≤ 34	2.224	71,65	880	28,35	Ref		
≥ 35	901	62,62	538	37,39	1,66	1,38 – 2,00	0,000
Parity							
1	878	63,95	495	36,05	Ref		
>1	2.247	70,88	923	29,12	0,64	0,53 - 0,77	0,000
Education							
No education/primary	842	85,22	146	14,78	Ref		
Secondary	1.864	71,47	744	28,53	1,09	0,86 – 1,38	0,462
Higher	419	44,42	528	55,76	1,14	0,85 – 1,53	0,395
Residence							

Rural	1.697	82,14	369	17,86	Ref		
Urban	1.428	57,65	1.049	42,35	1,44	1,20 – 1,73	0,000
Employement							
Not employed	1.728	72,24	664	27,76	Ref		
Employed	1.379	64,95	754	35,05	0,92	0,78 – 1,08	0,296
Index of wealth							
Quintile 1 (lowest)	956	89,68	110	10,32	Ref		
Quintile 2 (second)	704	81,01	165	18,99	1,49	1,12 – 2,00	0,007
Quintile 3 (middle)	640	75,92	203	24,08	1,44	1,08 – 1,93	0,014
Quintile 4 (fourth)	510	61,82	315	38,18	1,72	1,27 – 2,32	0,000
Quintile 5 (highest)	315	33,51	625	66,49	3,34	2,42 – 4,59	0,000
Anatenatal frequency							
0-3 times	245	79,80	62	20,20	Ref		
≥ 4 times	2.880	67,99	1.356	32,01	1,49	1,06 – 2,10	0,023
Pregnancy complications							
No	2.682	71,94	1.046	28,06	Ref		
Yes	443	54,36	372	45,64	2,39	1,96 – 2,91	0,000
Birth complications							
No	1.203	75,61	388	24,39	Ref		
Yes	1.922	65,11	1.030	34,89	1,04	0,88 – 1,24	0,641
Antenatal care facilities							
Government	2.377	83,11	483	16,89	Ref		
Private	748	44,44	935	55,56	1,05	0,84 – 1,30	0,684
Birth facilities							
Government	2.132	79,05	565	20,95	Ref		
Private	993	53,79	853	46,21	1,29	1,07 – 1,54	0,006

The results of the bivariate analysis of women who chose to be carried out pregnancy checks at the midwife for skilled birth attendants who were assisted by obstetricians were 13.06%, while those who were examined by obstetricians who chose skilled birth attendants by obstetricians were also 68.53%. The results of statistical tests showed that there was a correlation between pregnancy examiners and skilled birth attendants ($p < 0.05$). OR 14.50 (95% CI 12.46-16.88) which means that pregnancy examiners from obstetricians are more likely to give birth by staying with obstetricians by 14.5 times than other examiners (midwives). Several sociodemographic factors of the mother that influence the selection of skilled birth attendants, namely women with health insurance have 1.77 times (95% CI 1.54 – 2.04) chance of giving birth with an obstetrician compared to women without health insurance. Women aged > 35 have 1.51 times (95% CI 1.32 – 1.72) to give birth with an obstetrician compared to women aged < 34. Women with a higher education have a chance of 7.27 times (95% CI 5.85 – 9.03) in giving birth with an obstetrician compared to women with a low education. Women who live in urban areas are 3.38 times more likely (95% CI 2.94 – 3.88) to give birth with an obstetrician than women who live in rural areas. Women who worked had 1.40 times (95% CI 1.24 -1.59) in giving birth to obstetricians than women who did not work. Women with a high economic status had 17.24 times (95% CI 13.57 – 21.91) chance to give birth by an obstetrician compared to women with low economic status. Women with pregnancy complications had a chance of 2.15 times (95% CI 1.84 – 2.51) to give birth with an obstetrician compared to women without pregnancy complications. Women with labor complications had 1.66 times (95% CI 1.45 – 1.91) chance of giving birth with an obstetrician compared to women without labor complications. Women who had antenatal care examinations at private health facilities had 6.15 times (95% CI 5.36 – 7.06) chance of giving birth with obstetricians than women who had antenatal care examinations at government health facilities. Women who gave birth at private health facilities had 3.24 times (95% CI 5.36 – 7.06) chance to give birth with an obstetrician than women who gave birth at government health facilities. The multivariate results showed that the

dominant factor for the birth attendant was the pregnancy examiner. Pregnancy examiners by obstetricians have the opportunity to choose a permanent delivery at an obstetrician, which is 8.33 times compared to choosing a midwife after being controlled by other variables.

The results of this study indicate that in 2017 women who had an examination at an obstetrician were 8.33 times higher (95% CI 6.75 – 10.29) to give birth with an obstetrician than women who had a pregnancy examination at a midwife. Meanwhile, women who have health insurance are 1.3 times higher (95% CI 1.09 – 1.55) to give birth with an obstetrician than a midwife. Obstetricians play an important role in antenatal care to detect complications during pregnancy and childbirth. Antenatal services are provided by doctors, midwives, and nurses under applicable regulations (15). Several other factors influenced the selection of skilled birth attendants, such as educational status which showed that women with a higher education were 1.14 times more likely (95% CI 0.85 – 1.53) to give birth with obstetricians than midwives. Education plays an important role in the selection of health services as explained by Grossman (1972) that the higher a person's education, the higher the need for optimal services. Women living in urban areas were 1.44 times more likely (95% CI 1.20 – 1.73) to give birth to a specialist compared to a midwife.

Other results showed that women with an economic status of quintile 5 (highest) were 3.34 times higher (95% CI 2.42 – 4.59) giving birth with obstetricians compared to midwives. Economic factors play a significant role in determining the choice of place of delivery because the use of health facilities and facilities depends on the community's ability to afford (16). In addition, women who did antenatal care examination (ANC) > 4 times were 1.49 times higher (95% CI 1.06 – 2.10) to give birth with an obstetrician. An antenatal check-up is a health service that aims to ensure the health condition of the mother and baby. This is supported by the results of this study showing pregnancy complications and childbirth complications play an important role in determining skilled birth attendants. Women with pregnancy complications were 2.39 (95% CI 1.96 – 2.91) more likely to give birth with obstetricians than midwives. Meanwhile, women with delivery complications were 1.04 times higher (95% CI 0.88 – 1.24) in giving birth to an obstetrician than a midwife. This is supported by the study of Ganap et.al who reported the role of obstetricians with the management of obstetric emergencies (17). Another factor that contributed to the selection of skilled birth attendants was that women who had antenatal care examinations at private health facilities were 1.05 higher (95% CI 0.84 – 1.30) in giving birth to obstetricians compared to midwives. While women who gave birth at private health facilities were 1.29 times higher (95% CI 1.07 – 1.54) to give birth to an obstetrician compared to a midwife. The existence of technological advances in maternal health services that tend to be used in private health facilities encourages women to carry out pregnancy and childbirth examinations at private health facilities

5. Conclusion

The results of this study indicate that maternal sociodemographic factors such as higher education status, high economic status, and area of residence, tend to give birth with an obstetrician. Obstetricians and gynecologists play a role in handling obstetric emergencies such as complications of pregnancy and childbirth.

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