Relationship between antenatal care and pregnancy classes with selection of place and birth attendant in Indonesia

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Original Article

ABSTRACT

Background: Maternal mortality rate (MMR) in Indonesia is still high, 359 per 100,000 born alive. One of the government's efforts to reduce MMR is by providing antenatal care (ANC) service, and holding pregnancy classes (KIH). KIH is a program to increase maternal knowledge and support the making pregnancy safer (MPS) program policy, which is an Obstetric service approach, that every pregnant woman must be assisted by health workers.

Objective: The purpose of this study is to determine the relationship between ANC and KIH to the place and birth attendants.

Methods: A cross-sectional study, national health indicator survey (SIRKESNAS) 2016, calculation of samples based on the 2010 population census (SP) data. Primary sampling unit (PSU) is a sub-district selected as probability proportional to size (PPS), households that have children aged 0-59 months (Eligible households), samples were selected by simple random sampling of eligible households, as many as 7,313 mothers. The collected variables were ANC, KIH, and the place and birth attendant. Data were analyzed by logistic regression test

Results: Logistic regression test results showed that the ANC was positively related to the place of delivery (OR 4,054; p <0.000) and birth attendants (OR 2,659; p <0.000). There was a relationship between KIH and the place of delivery (OR 1,327; p <0.001), and birth attendants (OR 1,718; p <0.000).

Conclusion: Mothers who performed at least 4 ANCs, and attended pregnancy classes, were more likely to choose to deliver in health care facilities and deliver with health workers.

Latar Belakang: Angka Kematian Ibu (AKI) di Indonesia masih tinggi, sebesar 359 per 100.000 kelahiran hidup. Salah satu upaya pemerintah untuk menurunkan AKI adalah dengan pelayanan antenatal care *(ANC), dan menyelenggarakan kelas ibu hamil (KIH). KIH merupakan program untuk meningkatkan pengetahuan ibu dan mendukung kebijakan program* making pregnancy safer *(MPS), yaitu pola pendekatan pelayanan Obstetric, bahwa setiap ibu hamil harus ditolong oleh tenaga kesehatan.*

Tujuan: Tujuan studi ini untuk mengetahui hubungan ANC dan KIH terhadap tempat dan penolong persalinan.

Metode: Studi cross sectional, *survei indikator kesehatan nasional (SIRKESNAS) 2016, penghitungan sampel berdasarkan kerangka sampel sensus penduduk (SP) 2010.* Primary sampling unit *(PSU) adalah kecamatan yang dipilih secara* probability proportional to size *(PPS), yaitu rumah tangga yang mempunyai anak usia 0-59 bulan (rumah tangga eligible), sampel dipilih secara* simple random sampling *terhadap rumah tangga eligible, sebanyak 7.313 ibu. Variabel yang diambil adalah ANC dan KIH sebagai variabel*

bebas, sedangkan variabel terikatnya adalah tempat dan penolong persalinan. Data dianalisis dengan uji regresi logistik.

Hasil: *Hasil uji regresi logistik menunjukkan ANC berhubungan positif dengan tempat persalinan (OR 4.054; p<0.000) dan penolong persalinan (OR 2.659; p<0.000). Ada hubungan antara KIH dengan tempat persalinan (OR 1.327; p<0.001), dan penolong persalinan (OR 1.718; p<0.000).*

Kesimpulan: *Ibu yang melakukan minimal 4 kali ANC, dan mengikuti kelas ibu hamil, memiliki kemungkinan lebih tinggi untuk memilih bersalin di fasilitas pelayanan kesehatan dan bersalin dengan tenaga kesehatan.*

INTRODUCTION

The Maternal Mortality Rate (MMR) is a matter of global concern as this becomes the main indicator of the health status of a nation and the quality of health services provided to pregnant women or Ante-Natal Care (ANC).[1] MMR in developing countries like Indonesia is still high, at 359 per 100,000 live births.[2] That number is far higher than the WHO 230 per 100,000 live births, whereas the 2015 MDG target is 102 per 100,000 live births.[3]

The three biggest causes of maternal mortality are bleeding, hypertension and other diseases.[4] Therefore, the government's major role in improving the quality of health services, both at the level of first-level health facilities (*Fasilitas Kesehatan Tingkat Pertama* - FKTP) and at advanced health facilities (*Fasilitas Kesehatan Tingkat Lanjut* -FKTL) is urgently needed.[4]

Pregnancy and childbirth are the natural processes of a mother who is ready to continue their heredity by producing off-springs. The maternal age that is considered as an ideal age to conceive is between the 20 to 35 years.[5] However, the natural process of pregnancy and childbirth are often disrupted by undesirable complications that are not detected before.

Therefore, it is necessary to consider the accessible health services to pregnant women to achieve the frequency target of ANC visits at least 4 times during pregnancy.[6] ANC is recommended to be carried out as early as possible to detect the health problem in pregnant women and to prevent childbirth complications. It is one of the "Four Pillars of Safe Motherhood" which aims to improve maternal and fetal health by improving relations/interactions with mothers, detecting complications of pregnancy and preparing for safe delivery and providing education to pregnant women.[6] Thus, improving the quality of ANC services is needed to reduce MMR by 20%.[6]

Efforts to increase the scope of ANC have been carried out through pregnant mothers' class programs (kelas ibu hamil - KIH) since 2009. Visits of pregnant women to conduct pregnancy checks to health workers are already quite high, the percentage of K4 pregnant women is 72.5% with a 2015 target of 72 %.[3,7,8] KIH is a learning tool for mothers to increase their knowledge of the pregnancy, a place to share, face-to-face, consultation on pregnancy issues, delivery planning, myths of infectious diseases and birth certificates.[9] KIH should be the appropriate communication tool in planning a safe place and birth attendant. In the 2010 making pregnancy safer(MPS) program policy, it is stated that one of the obstetric service approaches to every pregnant woman is that every delivery must be assisted by trained health workers.[1] However, in the implementation of KIH, there are still some obstacles, including the implementation that is not under the implementation guidelines issued by the Indonesian Ministry of Health in 2009.[9]

A study in Malang in 2009 showed that only 30% of pregnancy class activities were carried out well, 20% were not good and 50% had not held pregnancy classes.[10] It is an indication that the implementation of KIH needs to be done more intensively by involving midwives' independent practice and motivating them to be more positive towards the pregnancy classes. Some factors that influence the implementation include policies, resources, socialization of guidelines, the active role of private practice midwives and motivation of officers and pregnant women.[10,11]

Several studies of the KIH effect have been conducted to detect danger signs of pregnancy, but with limited samples and regions.[12] Efforts to raise awareness of mothers to actively participate in pregnancy class programs are a challenge for health workers in the field. Among other things, maternal participation in pregnancy classes is influenced by family support.[13] The role of health workers in family involvement (the husband and parents) is a strategic effort to foster awareness and participation in the pregnancy class.

One research in Africa, 2017 stated that it is necessary to increase the number of health facilities, increase the knowledge of mothers and partners about the readiness of childbirth and the selection of labour in health facilities.[14] The results of the study support the implementation and improvement of the quality of pregnancy classes so that all pregnant women can participate in the program.[15] Based on these studies, KIH has a strategic role in the MPS program.

The coverage of delivery assistance by health workers in 2013 was quite high at 90.88%.[4] A total of 21 provinces have met the targets according to the Ministry of Health's strategic plan.[8] But this coverage was not distributed in all provinces and 29.6% of deliveries performed at home.[16]

Much research into the relationship between ANC and childbirth assistance options, but which has a large sample size and wider geographic coverage in Indonesia has not been obtained.[17-20] Therefore, this study will represent a wider sample and area in Indonesia related to the relationship of ANC and KIH to the choice of place and birth attendants. This study tries to answer, is there a relationship between ANC and KIH with the choice of place and delivery assistance in Indonesia.

METHODS
Study Design
This study was conducted based on secondary data from the 2016 SIRKESNAS, which is a survey using the cross-sectional method conducted in 34 provinces, 264 districts/cities in Indonesia, 1,200 census blocks, with a target of 30,000 households with several PSU in the form of 400 districts. The census block sample frame used in the survey is the master census block at the 2010 population census (SP2010). While the household sample framework uses a list of ordinary households that have children aged 0-59 months as a result of the update in November 2015, also called eligible households.

Design sampling with the multistage cluster sample method which is obtained through several stages. The first stage was to choose the PSU which is a sub-district of 400 taken by PPS. From the sub-districts, there are 3 census blocks selected by PPS with the number of households (second stage). In the third stage, namely household selection, 25 census blocks were taken for each census block, which was systematically selected as a result of updating households that had children aged 0-59 months. The sample design in this survey can describe research indicators up to the district/city level.

Population and Sample
The study population was households in Indonesia from 264 districts/cities in 34 provinces that were respondents of the 2016 national circulation. The sample was households with children aged 0-59 months (eligible households) selected with the total sample of 7,313 mothers. Data collection techniques by direct interview using a questionnaire conducted by trained enumerators.

The collected variables include maternal characteristics, antenatal care (ANC) and classes of pregnant women (KIH). Maternal characteristics data consists of age, occupation, and education. The respondents was grouped into two groups by age, namely the age group of safe reproduction (aged 20-35 years), and the age of reproduction is less safe (aged < 20 years or > 35 years). A mother's education was categorized into basic education (elementary/junior high) and higher education (high school and college), while work was classified into

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working and not working.

ANC data was defined as the number of visits to health personnel during her pregnancy. ANC is said to be complete if it has been examined by health personnel for four or more visits, with details once in the first trimester, one second trimester and twice in the third trimester. It is said to be incomplete if conducting an inspection of fewer than four visits with details as mentioned above. Pregnant women's participation in the classis the participation of mother in-class activities during pregnancy according to the program, which is a minimum of three times. Childbirth is a place where mothers give birth which is categorized into health service facilities and non-health service facilities. The health facilities included in this study were hospitals, clinics, maternity hospitals, primary health care (Puskesmas), assisting Puskesmas, health workers, village health care (*Pos kesehatan desa* – Poskesdes) and village delivery care (*Pondok Bersalin Desa* – Polindes). Childbirth Assistance is the person who first helps the labour process is categorized as health workers and non-health workers. Data analysis was performed Regression Logistic relationship analysis to find out the relationship between variables.

Data Collection Method

Data collection was carried out by enumerators/interviewers who were trained in the interview method using structured instruments and had carried out preliminary studies.

Data Analysis

The quality of the data used for analysis has been through the stages of editing and cleaning data. Data analysis using SPSS software. 21 with a license owned by the magelang health research and development center. The analysis was performed with a complex sample that had been weighted before. Bivariate analysis using the Chi-Square test with a probability value (p-value) with a significance of $\alpha < 5\%$ to see the relationship between variables and selection to enter the multivariate model. Multivariate analysis was performed by logistic regression.

RESULTS

Analysis of the relationship between variables can be seen in Table 1. The variable of respondent's work showed there is no relationship between work and place and birth assistant with a value of p> 0.05. Analysis of the age of respondents with childbirth assistance also did not have a relationship but there was a relationship between the age of the respondents with the choice of delivery place with a p-value <0.05.

Logistic regression analysis between ANC and KIH variables to the place of delivery can be seen in Table 2. The relationship between ANC and KIH and this particular variable had the p-value of <0.05, meaning that there is a significant relationship between ANC and KIH with the place of delivery. Assessing the statistics significance was performed by looking at the p-value and the confidence level of OR, in which both of these p values are less than 0.05 and in the range of confidence intervals of the OR values excluding 1, meaning that the ANC and KIH variables are significantly related to the place of delivery after adjusted for education and age variables.

Logistic regression analysis between ANC and KIH variables to childbirth Attendant can be seen in table 3. The relationship between ANC and KIH variables to childbirth assistants obtained p-value <0.05, meaning that there is a significant relationship between ANC and KIH with this particular variable. Assessment of statistical significance was done by looking at the p-value and the confidence level of OR, which means that ANC and KIH variables are significantly related to childbirth assistance, after being adjusted for the education variable.

Table 1. Relationship of characteristics of pregnant women, ANC, participation of pregnancy class programs with the choice of places and birth attendants for Indonesia

Variables	Delivery place					Delivery attendant				
	Health facility		Non-health facility			Health worker		Non health worker		
	Number	%	Number	%	P	Number	%	Number	%	P
Age										
Less safe	1.187	73.54	427	26.46	0.008	1.293	80.11	321	19.89	0.153
Safe	4.374	76.75	1.325	23.25		4.655	81.68	1.044	18.32	
Education										
Low	2.748	67.63	1.315	32.37	0.000	3.019	74.30	1.044	25.70	0.000
High	2.813	86.55	437	13.45		2.929	90.12	321	9.88	
Working										
Yes	1.801	76.51	553	23.49	0.521	1.918	81.48	436	18.52	0.828
No	3.760	23.87	1.199	76.13		4.030	30.26	929	69.74	
ANC										
Completed	1.415	58.02	1.024	41.98	0.000	1.680	18.12	759	8.18	0.000
Incomplete	4.146	85.06	728	14.94		4.268	87.57	606	12.43	
Class Participation										
No	4.602	74.88	1.544	25.12	0.000	4.948	97.59	1.220	2.40	0.000
Yes	959	82.18	208	17.82		1.022	87.58	145	12.42	

Table 2. Logistic regression analysis of ANC and KIH variables at the place of delivery

Variables	Delivery place				Sig.	OR	95% C I for OR	
	Health facility		Non health facility					
	Number	%	Number	%			Lower	Upper
ANC								
Completed	4.146	85.06	728	14.94	0.000	4.054	3.622	4.539
Incomplete	1.415	58.02	1.024	41.98				
Pregnancy Class								
Yes	959	82.18	208	17.82	0.001	1.327	1.122	1.568
No	4.602	74.88	1.544	25.12				

Table 3. Analysis of educational logistic regression, ANC and KIH for birth attendants

Variables	Delivery attendant				Sig.	OR	95% C I for OR	
	Health worker		Non health worker					
	Number	%	Number	%			Lower	Upper
Education								
High	2.929	90.12	321	9.88	0.000	2.791	2.430	3.206
Low	3.019	74.31	1.044	25.69				
ANC								
Completed	4.268	87.58	606	12.42	0.000	2.659	2.348	3.011
Incomplete	1.680	68.88	759	31.12				
Pregnancy Class								
Yes	1.022	87.57	145	12.43	0.000	1.718	1.419	2.081
No	4.926	80.15	1.220	19.85				

DISCUSSION

This study successfully collected data of 7,313 respondents, from 264 districts in 34 provinces. Respondents in this survey are households with children aged 0-59 months (eligible households) selected, who become the 2016 SIRKESNAS sample.[7] Data collection techniques by interview, using a questionnaire, interviews conducted by trained enumerators.[7]

Pregnancy and the first years of human life is a golden period for continued growth and development. There is empirical evidence that this period is very vulnerable to the health effects and anxiety of pregnancy.[21] Therefore, to improve the health and anxiety of pregnant women, the government recommends the ANC examination in the national program.[1] A complete and quality ANC service is expected to reduce the maternal mortality rate (MMR) by 20%.[6]

Maternal deaths due to pregnancy and childbirth can be classified into three types such as gynecology, antenatal/postnatal and delivery processes. It has become one of the public health problems in developing countries such as in the State of Nigeria.[22] According to the research in that country, the biggest cause of death was noted during the Antenatal/Postnatal period, which was 57%. The biggest case in the Antenatal period is ectopic pregnancy while in the Postnatal period is bleeding.[22] Another similar research in Brazil states that the cause of death is due to inadequate prenatal care (OR = 2.49) and newborn care.[23]

Table 1 showed that mothers who completed the ANC examination were 85.06%. This is consistent with the results of Suwanti's study in Sumbawa in 2013, amounting to 67.1% of pregnant women undergoing complete ANC, with a total sample of 79 pregnant women.[17] The analysis of the ANC relationship with the place of delivery showed a significant relationship, with a p-value of 0,000. Logistic regression test results showed an OR value of 4.054, meaning that the possibility of mothers who did ANC at least 4 times chose to give birth at the social facility 4.054 times compared to mothers who did ANC less than 4 times.

Table 3 showed an OR value of 2.659, meaning that the possibility of mothers who did ANC at least 4 times chose to deliver with health workers 2.659 times compared to mothers who did ANC less than 4 times. The results of this analysis are consistent with other studies that say the more often pregnant women visit Antenatal, the more they likely to choose health workers for labor.[17-20] Besides, 2013 RISKESDAS also showed an increase in maternal visits to

ANCs and in the choice of birth attendants by health workers. Unfortunately, this was not immediately followed by a decrease in MMR. It appeared that an increased coverage of ANCs and birth attendants by health workers is not enough to contribute much to the reduction in MMR.[16,24]

Pregnancy class program (KIH) is a program to increase maternal knowledge of pregnancy, childbirth, baby care, myths of illness and birth certificates performed at 20–32 weeks' gestation. The program is expected to support activities and increase ANC coverage. However the KIH program has not yet run optimally.[15] The number of mothers participating in the pregnancy class was only 13.11%. The results of other studies indicate that the implementation of pregnancy class programs in Malang only 30% which is doing well, meanwhile 20% is not good and 50% are not implementing the program.[10] Another suggests that the pregnancy class influences the perception of the self-control and the intensity of the mother to provide exclusive breastfeeding.[25] This is in line with the results of other studies that stated there is a difference between the level of knowledge of pregnant women before and after attending pregnancy classes at the Wangon II Health Center in 2012.[26]

The activeness of pregnant women in joining the pregnancy class is still a problem, besides family factors, individual factors such as activities/occupations also affect. Based on observations from several research results, respondents who do not work are more likely to attend the classes. This is due to working pregnant women who will find it more difficult to adjust the pregnancy class schedule.[27] Therefore, alternatives are urged to improve the pregnancy class program such as relaxation exercises that can be used as a model or alternative intervention to manage the anxiety of pregnant women in facing childbirth.[28] In accordance with Fuada's research, the KIH implementation still has the opportunity to be carried out to increase the knowledge of pregnant women.[29]

Table 2 showed a significant relationship between variables with a p-value of 0.001. Logistic regression test results showed an OR value of 1.327, which means the likelihood of mothers attending maternity classes at maternity health was 1.327 times compared to mothers who delivered do not attend the pregnant mothers' class program. While the logistic regression test results of maternal participation to KIH with childbirth assistance showed an OR value of 1,718, this means the likelihood of mothers participating in the KIH program chose to give birth with health workers 1,718 times compared to mothers who did not attend the KIH program (table 3).

Table 1 shows the difference in the coverage of births by health workers and deliveries at the health facilities was 81.33% and 76.04% respectively. This means that even though the coverage of childbirth assistance is high, not all deliveries are performed in health care facilities. There are 5.29% of women who deliver outside the health facility and it is far below the results of the 2013 RISKESDAS survey which was 29.6%.[16] Thus, this might indicates a significant improvement in maternal coverage in health care facilities.

Health services are important in improving public health in promotive, preventive, curative and rehabilitative areas.[30] Moreover, it is important to pay attention to the distribution of available health service personnel and facilities and the quality of trained personnel in the handling of neonatal emergency emergencies. Various studies show that the personnel and first-level health facilities (FKTP) are not evenly distributed throughout Indonesia (Inequity) which resulted in hampering the public health improvement programs.

The results of the 2011 Health facility research (*riset fasilitas kesehatan* –RIFASKES) showed that labour distribution was not evenly distributed, even some primary health service (Puskesmas) were run without doctors. It was stated that around 4.2% of puskesmas have no doctors, 0.3% have no nurses, and 1.2% do not have midwives.[31]

The distribution of health facilities has not yet reached communities in remote parts of the archipelago, even the results of the 2011 Rifaskes showed that 18.5% of puskesmas buildings were in moderate and severe damaged conditions.[31] Accordingly, research in Nigeria states that there is a significant relationship between health care location and utilization because those who live far from service points cannot come regularly to conduct ANC.[32] However, this study did not provide data on the distance of the respondent's house to the place of the maternal health care facilities and birth attendants.

Increasing coverage of delivery assistance by qualified health workers is an effective way to reduce MMR. This is supported by a study in NTT, 2015 which stated that maternal mortality was identified in women who had never done ANC during pregnancy but also occurred despite doing ANC> 4 times with several other factors. Thus, the improvement of ANC services is urgently needed.[33]

One way to improve the quality of ANC services includes communication between health workers through pregnancy check records. A pregnancy record (Medical Record) is very crucial for both patients and health professionals. Learning the ANC history is important to identify the birth planning. By that, research in South Africa also showed that quality of antenatal care records need to be improved, moreover the record is the main source of information and communication between midwives and other health workers.[34]

Additionally, other studies with meta-analysis showed that women planning births in hospitals have a statistically lower risk of risk than elsewhere planned.[21] However, the results were different in high-income countries showed no significant relationship between birthplace and infant mortality for a low-risk pregnancy, where home birth for low-risk women is considered as a choice under the assistance of health workers.[35]

CONCLUSION

The participation of maternal KIH is quite low, which is only 15.95%, while the choice of place of delivery in health service facilities is 76.04% with the help of delivery of health workers 81.33%) is quite high. In connection with the selection of maternity in health care facilities, mothers who did at least 4 ANCs had a probability of 4.054 times compared to women who did ANCs less than 4 times, and Mothers who took KIH had 1,327 times compared to women who did not participate in the pregnant mothers class program. In connection with the selection of births with helper health workers, mothers who did ANC at least 4 times chose to give birth with health workers 2,659 times compared to mothers who did ANC less than 4 times, and mothers who participated in the KIH program chose to give birth with health workers 1,718 times compared to mothers who did not join the KIH program.

CONFLICT OF INTEREST

I declare that there are no conflicts of interest in the writing of this article and publication.

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