

PERFORMANCE ANALYSIS OF CHILDREN'S HEALTH PROGRAM IN INDONESIA: A MULTILEVEL ANALYSIS

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ABSTRACT

Background: Most of the neonatal deaths that occur after 6-48 hours postpartum can be prevented with appropriate newborn care and initiated immediately after delivery through adequate and standardized first neonatal visit. In Indonesia, it is still not in accordance with the expected target. This study aimed to analyze the factors that influence the first neonatal visit from various levels through a multilevel analysis approach.

Subjects and Method: This was a cross sectional study with samples of individual level (level 1) was 1014 mother babies, village Level (level 2) as many as 95 village managers, public health center (level 3) was 51 manager of child health programs, and district level (level 4) was 13 managers of health programs in eight provinces Indonesia. The dependent variable was first neonatal visits. The independent variables were birth attendant and pregnancy counselling (level 1), number of village midwives and community control in development (level 2), partnership and resources (level 3), and policy strategy (level 4). Data analysis was performed through univariate, bivariate, multivariate analysis with logistic regression and multilevel modeling using multilevel regression logistic random intercept analysis run on Stata 14.0.

Results: At level 1, birth attendants increased first neonatal visits (OR = 3.21; 95% CI 95% = 1,984 to 5,182; $p < 0.001$), pregnancy counselling (OR = 1,705; 95% CI 95% = 1,162 to 2,503; $p = 0.007$) significantly. At level 2 modelling, the number of village midwives increased the risk of the first neonatal visit (OR = 1,815; 95% CI = 0.950 to 3,467; $p = 0.049$), community control (OR = 2,659; 95% CI = 1.396 to 5.066; $p = 0.009$) significantly. At level 3 modelling, partnerships and resources significantly increased the first neonatal visit (OR = 2,131; 95% CI = 1,114 to 4,078; $p = 0.012$) significantly. At level 4 modelling, birth attendants significantly increased the first neonatal visits (OR = 3.056; 95% CI = 1.901 to 4,914; $p = 0.029$) significantly.

Conclusion: Birth attendants, pregnancy counselling, the number of village midwives, community control, partnerships and resources, birth attendants increase the risk of first neonatal visit. Contextual village areas, public health center, and district health offices have contextual effects on the first neonatal visit.

Keywords: first neonatal visit, multilevel analysis

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BACKGROUND

Indonesia's neonatal mortality rate is slow, from 20 per 1,000 live births in the 2007 IDHS to 19 per 1,000 live births in the 2012 IDHS (2012 IDHS). Of the total infant mortality, 55.8% occur in the neonatal period,

and around 78.5 % occur at 0-6 days (Ris-kesdas 2012). Standardized neonatal health care efforts can reduce the causes of neonatal mortality through the first neonatal visit (neonatal visit). Based on several research re-

sults, both access and quality have not been achieved according to the target.

From Riskesdas data 2013, neonatal visit indicators' achievement in the first 6-48 hours (neonatal visit) was still below the expected target. There was a decrease in the neonatal visit achievement from Riskesdas 2010, from 71.4% to 71.3% in Riskesdas 2013. Even those who did not attend neonatal visits increased relatively high from 20.8% of Riskesdas in 2010 to 21.5% in Riskesdas in 2013.

There are differences in neonatal visit achievements between the data obtained from routine reports of the Puskesmas program from the Ministry of Health's Pusdatin data (Facility Based) and research data (Community based). The research data showed data is lower than the routine report data for the Puskesmas program. Therefore, it needs to be balanced through verification of data from research results.

This study aimed to analyze the factors that affect children's health care programs' performance through the neonatal visit access indicator in Indonesia by analyzing the contribution of variables at various levels. The units/levels analyzed were individual variables as level 1. The aggregate variable, the village area as level 2. Level 3 was the Puskesmas, and level 4 was the District Health Office.

To analyze the variables at levels 1 and 2 of individual mothers and village areas, the author uses a frame of mind about the theory developed by Andersen and Morrison about the use of health services (Health care Utilization). The social determinants of health developed by Whitehead and Dahlgren where the first neonatal visit (neonatal visit) is analogous to health service utilization behaviour.

This theory explains health's social ecological theory, in which the level/-

hierarchy/layer affects health. This theory maps the relationship between the individual and the area/environment to disease and health status, including health behavior. Individuals are at the center with the contribution of several components around them that influence their health status.

SUBJECTS AND METHOD

1. Study Design

This was a cross sectional study conducted in eight provinces Indonesia.

2. Population and Sample

The samples of individual level (level 1) were 1014 mother babies, village Level (level 2) as many as 95 village managers, public health center (level 3) was 51 manager of child health programs, and district level (level 4) was 13 managers of health programs.

3. Study Variables

The dependent variable was first neonatal visits. The independent variables were birth attendant and pregnancy counselling (level 1), number of village midwives and community control in development (level 2), partnership and resources (level 3), and policy strategy (level 4).

4. Data Analysis

Data analysis was performed through univariate, bivariate, multivariate analysis with logistic regression and multilevel modeling using multilevel regression logistic random intercept analysis run on Stata 14.0.

RESULTS

The results showed that more babies who did not have the first neonatal visit had access to 532 babies (52.3%) compared to babies who did the first neonatal visit access was 482 (47.5%). Table 1 showed neonatal visit reduced with birth attendant assisted birth ($b=1.01$; 95% CI= 2.08 to 4.35; <0.001), did not do pregnancy counseling ($b=0.30$; 95% CI= 1.01 to 1.82; $p=0.045$), maternal education ($b=0.07$; 95% CI= 0.94 to 1.22; $p=0.277$).

Table 1. Level 1 multivariate modeling of neonatal visit access

Variables	Coef	SE	OR	95% CI		p
				Lower	Upper	
Birth attendant	1.10	0.19	3.01	2.08	4.35	<0.001
Pregnancy counseling	0.30	0.15	1.35	1.01	1.82	0.045
Maternal education	0.07	0.07	1.08	0.94	1.22	0.277
Constant	- 1.30	0.20	0.27			<0.001

Table 2. Multilevel modeling

Variables	Coef	SE	OR	95% CI		p
				Lower	Upper	
Level 1						
Birth attendant	1.12	0.24	3.06	1.90	4.91	<0.001
Pregnancy counselling	0.53	0.20	1.69	1.16	2.48	0.526
Level 2						
Number of village Midwives	0.63	0.32	1.88	1.00	3.52	0.049
Community development control	0.85	0.32	2.33	1.23	4.40	0.009
Level 3						
Partnership Resources	0.83	0.33	2.29	1.20	4.36	0.012
Level 4						
Policy and strategy	0.76	0.35	2.13	1.08	4.18	0.029
Constant	-4.44	0.87				0.000

At level 1 modeling, neonatal visit reduced with birth attendant (OR= 3.06; 95% CI= 1.90 to 4.91; p<0.001), which means mothers whose deliveries were assisted by non-health personnel had 3.06 times chance for their babies not to do neonatal visit than mothers who gave birth in health workers. Neonatal visit reduced with mothers did not do pregnancy counselling (OR= 1.69; 95% CI= 1.16 to 2.48; p= 0.526) meaning that mothers who did not receive pregnancy counseling in the 3rd trimester had a 1.69 times chance for their babies not to neonatal visit than mothers who received pregnancy counseling in the 3rd trimester.

At the level 2 modeling (village), neonatal visit reduced with the number of village midwives (OR= 1.88; 95% CI= 1.00 to 3.52; p= 0.049), meaning that babies living in villages with a smaller number of village midwives had a 1.88 times chance of not doing

neonatal visit compared to babies living in villages with a greater number of village midwives. Neonatal visit reduced with poor community development control (OR= 2.66; 95% CI= 1.40 to 5.07; 0.009), meaning that babies who lived in villages with a poor level of community development control had 2.66 times chance for their babies not doing neonatal visit than babies who lived in villages with a good level of community development control.

At level 3 modeling, neonatal visit reduced with Puskesmas partnership and resources (OR= 2.29; 95% CI= 1.20 to 4.36; p= 0.012), meaning that babies living in Puskesmas areas that have poor partnership and resource capabilities had 2.29 times chance of not do neonatal visit compared to babies who live in Puskesmas areas that had good Partnership and Resource capabilities.

At level 4 modeling, neonatal visit reduced with policy and strategy of areas (OR=

2.13; 95% CI= 1.08 to 4.18; $p= 0.029$), meaning that babies living in areas that had poor policy and strategy had 2.13 times chance of not do neonatal visit compared to babies who live in areas that had good policies and strategies of the district health office.

DISCUSSION

The first neonatal visit is important because the neonatal period is a critical period where the incidence of pain and illness occurs. Infant mortality occurs mostly in the neonatal period, especially in the first 6-48 hours. The first days of life are very important because most of the neonatal deaths occur in this period, 25-45% in the first 24 hours and more than 50% in the first 48 hours (WHO, 2012).

Other literature also explained that 2/3 of infant mortality could occur in the first month (neonatal period), 2/3 were in the first week (early neonatal), and 2/3 early neonatal mortality. High risk occurred on the first day (Beck, 2004; MOH, 2008). Most neonatal deaths that occur after 48 hours postpartum can be prevented with proper newborn care starting immediately after delivery (WHO, 2012).

The results of the study from Bangladesh showed that newborns who received neonatal care within the first 48 hours after birth had a lower subsequent mortality rate than those neonatal delay care. If the number of neonatal visits to health facilities is low, it can be attempted through home visits. Therefore, neonatal care through home visits should be carried out as soon as possible (WHO_UNICEF, 2012).

For areas with high mortality and limited geographic and facilities aspects, WHO and UNICEF recommend at least two home visits for all home births: the first visit must be carried out within 24 hours of birth and the second visit on the third day. If possible,

the third visit should be made before the end of the first week of life (day 7). For babies born in health facilities, home visits must also be carried out. The first visit is scheduled as soon as possible after the mother and baby return home to avoid a loss to follow-up from neonatal services. The remaining visits must follow the same schedule as for home births (WHO_UNICEF, 2012).

For countries/ regions with low levels of public knowledge, neonatal visits are very important because families often have difficulty recognizing signs of illness and neonatal emergencies, especially in the first week of life, and determining appropriate treatment measures. Neonatal care helps families identify problems with newborns and addressing the search for good services. It promotes practices to maintain infant temperature, exclusive breastfeeding, and early initiation of breastfeeding (IMD) and improve personal hygiene and cord care (Ministry of Health RI, 2012).

The variables that contributed to neonatal visit access were birth attendants and pregnancy counseling. This indicates that the mother's access to health workers before the birth process will determine the mother's access in the next period. The neonatal visit process starts from the mother's initial interest in getting childbirth assistance services. The mother's contact with health personnel during delivery will increase the possibility of contact with health workers through the neonatal visit.

The results of this study are in line with the principle of the continuum of care that is being promoted by the government, that the health care process is a continuous process. To increase neonatal care access, mothers must receive services in the previous period, both during pregnancy and childbirth.

Third-trimester pregnancy counseling is a motivating factor for mothers to prepare

for delivery in health personnel. This also protects the door for neonatal services actively carried out by mothers visiting health workers and by health workers actively conducting home visits.

This study showed the variables in the individual mother determine the first neonatal visit. It is also influenced by contextual variables in this area, including the village, Puskesmas, and also the district health office. When viewed from each level's contribution apart from the individual variables, the village level variables make an immense contribution. The variables that significantly affect the village level are the number of village midwives with an OR= 1.88 and community control in development with an OR = 1.23.

The existence of a village midwife is very helpful in bridging access between the community and health workers. Community needs for village midwives, especially in rural areas, are crucial in encouraging health service utilization. Data univariate showed that most newborns do neonatal visits in midwife. The more village midwives in an area, the easier public access will be, either through home visits or babies being actively taken to carry out neonatal visits to health service facilities.

For the places where the neonatal visit was implemented, the neonatal visit was mostly carried out at home through home visits by midwives. The greater the number of village midwives, the more affordable the community will be to access services. Suppose the village does not have a village midwife. In that case, home visits are difficult to carry out, especially with geographic access that is difficult to strengthen with conditions of awareness and low public interest in coming directly to health workers or health service facilities.

Based on data from the ministry of health, health HR planning, and the Indonesian Midwives Association up to 2014, 20% of Indonesia's villages still did not have a midwife (IBI, 2015). The number of midwives is already very large in terms of numbers, but their distribution is still under control. The disparity in the areas of Java and Outside Java, especially outlying areas, borders, and islands, is still relatively high.

According to data from the 2011-2025 Health Workforce Development Plan, it is expected that in 2014 the availability of 75 midwives per 100,000 population (Global Health Alliance, 2011). Based on this, the government's role in fulfilling qualified and adequate health workers in terms of delivery assistance services and pregnancy counseling is an important thing in supporting the neonatal visit target's achievement. Health workers' role is demanded to be more proactive by making house visits a trigger for achieving the target of the first neonatal visit.

In addition to the variable number of village midwives, community control variables in development contribute to neonatal visit access. According to the theory of Social Capital and Social of Health determinants from Whitehead and Dahlgreen, the condition of the area includes the ability of the community to monitor, control problems in the area, for example, in terms of urban/rural development, the fulfillment of facilities and infrastructure and so on will help shape health attitudes and behaviors, society and the creation of public health status.

Positive regional conditions will help improve public health status. Conversely, a bad environment will impact decreasing the quality and health status of the people in the area. In terms of development to neonatal visit, the form of community control is that people have control in development both manifested in their ability to procure Polin-

des, Posyandu, and funds to overcome financing problems in childbirth bring access to health services.

This study concluded that the variables related to neonatal visit access and quality are birth attendants, place of delivery, and pregnancy counseling. In the multilevel analysis modeling, the results showed there is an influence of contextual village areas, including Puskesmas and District Health Offices, which affect the first neonatal visit.

The study suggestions are (1) To ensure the target of implementing the quality of the Puskesmas as a factor of customer satisfaction and community impact as a basis for improving service quality; (2) Puskesmas leaders implement a job apprenticeship for new midwives who are placed in the work area of the puskesmas which is supervised by a coordinating midwife at least 1 month before being released as a village midwife so that if there are errors in the procedure, tennis guidance can be immediately provided by officers who have more control; (3) Program managers must try to apply customer focus, facilitate midwives (field workers) to have 1 standard service manual which is always used as a reference in implementing neonatal visit services, and health workers must strive for mothers who give birth in health care facilities, the length of postpartum care is 3x24 hours; (4) Midwives must be willing to be placed in the village and live in the village where they work, besides that home visit can be a solution to reduce barriers to public access to neonatal visit, midwives must understand the importance of conceptualizing pregnancy and sustainable services through the principle of "continuum of care" and having a "caring" character for customers (mothers and children), and midwives must be obedient and disciplined in implementing neonatal visit service standards, especially in the types of services giving

Vitamin K, giving eye ointments, breast-feeding counseling, and checking for general danger signs, which are still rarely done; (5) The District Health Office should formulate NSPK (norms, standards, guidelines, and policies) to be implemented by Puskesmas in their working areas, therefore it is hoped that: optimizing the implementation of PMK No.33 of 2015 policy on guidelines for planning human health resources in procurement and distribution Village midwives, facilitate the provision of standard neonatal visit service manuals at puskesmas, and use of a better information system using a network-connected computer to increase the effectiveness and accuracy of reporting; and (6) Officials together with the health petgas strive to be able to move the community become a community with a level of community empowerment through: regular citizen meeting forums, participate in every activity, participate in mini loakkarya activities, officials collaborate with health workers, and form empowering team that serves as facilitator and consultant for the organization.

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