

Multilevel Analysis on the Contextual Effect of Community Health Center on Health Workers Performance

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ABSTRACT

Background: One of the high maternal mortality rates is caused by bleeding factors. The implementation of preventive effort that is less than optimal as well as the ability, understanding, and compliance of health personnel with Standard Operating Procedures (SPO) is still lacking and not in accordance with professional standards, allegedly a factor that affects the Maternal Mortality Rate (MMR). The performance of midwives in accordance with the SPO would have an impact on reducing mortality and improving the welfare of mothers and babies. This study aimed to analyze the factors that influence the performance of midwives in the early detection of bleeding.

Subjects and Method: This was a cross sectional study conducted at 25 public health centers in Banyuwangi, East Java, from February to May 2019. A total sample of 200 midwives was selected for this study by simple random sampling. The dependent variable was midwife performance. The independent variables were training, skill, leadership style, incentive, work motivation, age, and human source. The data were collected by questionnaire and analyzed by a multilevel multiple logistic regression run on Stata 13.

Results: Midwife performance increased with training ($b = 1.46$; 95% CI= 0.48 to 2.42; $p = 0.003$), skill ($b = 2.32$; 95% CI= 1.28 to 3.36; $p = 0.001$), high motivation ($b = 1.66$; 95% CI= 0.71 to 2.61; $p = 0.001$), incentive >Rp 1,000,000 ($b = 2.59$; 95% CI= 1.53 to 3.65; $p = 0.001$), positive leadership style ($b = 1.95$; 95 % CI= 0.93 to 2.96; $p = 0.001$), and human source>8 midwives ($b = 1.05$; 95% CI= 0.08 to 2.02; $p = 0.033$). Midwife performance decreased with age ≥ 35 years ($b = -1.16$; 95% CI= -2.16 to -0.16; $p = 0.023$). Community health center had strong contextual effect on midwife performance with ICC= 25.74%.

Conclusion: Midwife performance increases with training, skill, high motivation, incentive >Rp 1,000,000, positive leadership style, and human source>8 midwives. Midwife performance decreases with age ≥ 35 years. Community health center has strong contextual effect on midwife performance.

Keywords: work performance, midwives, multilevel analysis

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BACKGROUND

Maternal mortality rate is one indicator that describes the welfare of society in a country (Ministry of Health, 2014). Maternal death according to the World Health Organization (WHO) is death during pregnancy or in the 42-day period after the end of pregnancy, due to all causes related to or

exacerbated by pregnancy or treatment, but not caused by accidents or injuries. The main causes of maternal death in Indonesia are hypertension in pregnancy and post partum hemorrhage (Ministry of Health, 2015).

Banyuwangi Regency which is the regency with the largest area in East Java is

included in 5 regencies or cities which are the biggest contributors of AKI in East Java. In accordance with the 2016 East Java Health Profile data, there were 20 cases of Banyuwangi AKI, and 4 of them were caused by bleeding. The implementation of preventive effort that is less than optimal as well as the ability, understanding, and compliance of health personnel with Standard Operating Procedures (SPO) is still lacking and not in accordance with professional standards allegedly a factor affecting the MMR (Health Office, 2016).

Some diseases that cause maternal death such as bleeding can be detected early and it is anticipated that the manifestations would not get worse from pregnancy to the puerperium. The midwifery care management system is one of the factors that is thought to cause maternal mortality, especially in the detection of high risk of pregnant women who have not been optimal. Quality service is determined by human resource factors. The productivity or performance of workers is one of the benchmarks of the quality of these human resources. Wirawan (2009) stated that performance is a function of competency, attitude, and action. Carrying out the main tasks of the health function, administrative activities, and coaching that supports the success of the tasks carried out is one of the midwives' performance. The performance of midwives in the early detection of complications that occur in pregnant women, childbirth and childbirth and infants can be determined through midwifery service standards. A good performance of midwives would have an impact on increasing maternal well-being and reducing maternal and fetal mortality.

Danur et al. (2017) state that training has a positive influence on performance. In the training, it must be ensured that the expected results of the training are the

workers, in this case the midwives are able to complete the work well and for this achievement the midwives deserve compensation as compensation for the performance produced. Democratic leadership style is more effectively applied in organizations, such as health centers, because there are elements influencing a group of people or subordinates to work optimally according to their abilities.

Danur et al. (2017) states that exploring innovation, creativity, listening to opinions, and subordinate suggestions to achieve desired goals. To achieve these objectives, a very supportive environment such as facilities and infrastructure as well as a good atmosphere is needed by the workers. An environment that makes them feel comfortable and safe makes workers more motivated to work so that working time becomes more effective.

Rulihari et al., (2014) stated that midwives who had good performance motivation gave good performance outcomes and tended to increase, and midwives with good motivation could improve performance because the effectiveness of performance depended on motivation embedded in his soul. Ponasti and Dewi (2014) argue that leadership style, work environment, incentives and skills influence the performance improvement. Skills in solving problems encountered in the work of using knowledge and understanding of the situation at hand, so that they are technically able to perform services in accordance with standards, and are considered capable of recording and reporting related to the work performed. Incentives can motivate as well as rewards that trigger an increase in performance that is considered good in the work environment and is expected to encourage someone to carry out their duties according to standards.

SUBJECTS AND METHOD

1. Study Design

This was an analytic observational study with a cross-sectional design. The study was conducted at 25 community health centers in Banyuwangi, East Java, from February to March 2019.

2. Population and Samples

The target population consisted of all midwives in Banyuwangi Regency. A sample of 200 midwives was selected for this study by simple random sampling.

3. Study Variables

The dependent variable was work performance. The independent variables were training, skill, leadership style, incentive, motivation, age, and human resource.

4. Operational Definition of Variables

Midwives performance in early detection of childbirth bleeding is the ability or level of effort owned by midwives in carrying out their duties in accordance with the responsibilities given for early detection of childbirth bleeding. The measurement scale was continuous, and it was transformed into dichotomous.

Age was the age of the subjects from birth to when the study was conducted calculated in units of years. The measurement scale was continuous, and it was transformed into dichotomous.

Human resources was the number of health service personnel in health facilities based on work structures both at the public health centers, hospitals, and independent practice midwives. The measurement scale was continuous, and it was transformed into dichotomous.

Training is training that must be done to improve performances, one of which is for early detection of labor bleeding. The measurement scale was continuous, and it was transformed into dichotomous.

Skill was specific skills possessed by midwives who are involved in completing tasks

for implementing care that is given appropriately and quickly. The measurement scale was continuous, and it was transformed into dichotomous.

Leadership style was a combination of behavior and abilities possessed by someone so that the person has the ability to encourage others so that they can complete each task entrusted to him. The measurement scale was continuous, and it was transformed into dichotomous.

Incentive was in the form of bonuses, commissions, profit sharing, compensation received for midwives as a form of appreciation. The measurement scale was continuous, and it was transformed into dichotomous.

Work environment was all that exists around the workplace that can affect subjects both directly and indirectly included in it. The measurement scale was continuous, and it was transformed into dichotomous.

Motivation was the whole process of giving a motive or encouragement at work that can influence a person to take action to improve performance. The measurement scale was continuous, and it was transformed into dichotomous.

5. Study Instrument

Source of data used in this study came from primary and secondary data. The primary data was data obtained directly from the subjects in the form of data from interviews and questionnaires. Primary data sources were from performance, training, skills, leadership style, incentives, motivation, age, and work environment. Secondary data sources are data sources obtained from Public Health Centers Employment data. Secondary data sources are the number of midwife resources.

6. Data Analysis

Univariate analysis was performed to see the frequency distribution and sample

characteristics. Meanwhile, bivariate analysis was done using chi-square test to analyze the relationship between midwives' performance and independent variables. Multivariate analysis was performed using multilevel multiple logistic regression analysis. The contextual influence of public health center on midwives' performance is shown by the value of intra-class correlations (ICC).

7. Research Ethics

The research ethics includes informed consent, anonymity, confidentiality, and research ethics. Research ethics was obtained from the Health Research Ethics Commission at Dr. Moewardi Regional Hospital and was declared to be ethical based on Decree number: 503 /IV/HREC/2019.

RESULTS

1. Sample characteristics

Table 1 shows that the majority of subjects' education was $\geq D3$ midwifery amounting to 184 midwives (92%). 73.0% were at age < 35 years. 55.5% had trained. 54% had good skill. Those who had a positive leadership style are 101 (50.5%). Midwives who had high incentives were 101 (50.5%). Most of the midwives' resources were ≥ 136 (68%). Midwives who had strong work motivation were 110 (55%). 134 midwives (67%) had good performance.

2. Bivariate Analysis

Table 2 showed the results of the bivariate analysis. Table 2 showed that age decreased midwife performance (OR= 0.29; 95% CI= 0.15 to 0.56; $p < 0.001$), and it was statistically significant.

Training (OR= 2.94; 95% CI= 1.60 to 5.40; $p < 0.001$), motivation (OR= 5.84; 95% CI= 3.04 to 11.23; $p < 0.001$). Skill (OR= 6.10; 95% CI= 3.15 to 11.81; $p < 0.001$), positive leadership style (OR= 4.84; 95% CI= 2.52 to 9.31; $p < 0.001$), and human source ≥ 8 midwives (OR = 2.22;

95% CI= 1.19 to 4.12; $p = 0.011$) increased midwife performance.

Table 1. Sample characteristics

Characteristics	n	%
Education		
< Diploma 3	16	8.0
\geq Diploma 3	184	92.0
Age		
< 35 years old	146	73.0
\geq 35 years old	54	27.0
Training		
No training	89	44.5
Training	111	55.5
Skills		
Low	92	46.0
High	108	54.0
Leadership Style		
Negative	99	49.5
Positive	101	50.5
Incentive		
Low	99	49.5
High	101	50.5
Resource		
< 8 midwives	64	32.0
\geq 8 midwives	136	68.0
Work Motivation		
Weak	90	45.0
Strong	110	55.0
Midwives Performance		
Poor	66	33.0
Good	134	67.0

3. Multilevel Analysis

Table 3 showed the results of multilevel analysis. Table 3 showed that midwives aged ≥ 35 years old have the logodd to have a good performance by 1.41 units lower than age < 35 years old ($b = -1.41$; 95% CI= -2.55 to -0.27; $p = 0.016$). Training increased midwife performance. Trained midwife had logodd of good performance 1.35 units higher ($b = 1.35$; 95% CI= 0.28 to 2.41; $p = 0.013$).

Skill increased midwife performance. Midwife with good skill had logodd to good performance by 2.89 units higher than those with poor skill ($b = 2.89$; 95% CI= 1.44 to 4.31; $p < 0.001$).

Leadership style (b= 2.22; 95% CI= 1.03 to 3.40; p<0.001), high incentive (b= 3.10; 95% CI= 1.68 to 4.50; p <0.001), human source ≥ 8 midwives (b = 1.17; 95% CI= 0.11 to 2.23; p= 0.031), and high moti-

vation (b= 1.98; 95% CI= 0.82 to 3.13; p= 0.001) increased midwife performance.

Community health center had strong contextual effect on work performance with ICC= 25.74%.

Table 2. The Result of Bivariate Analysis

Independent Variables	Midwife Performance				OR	95% CI	p
	Poor		Good				
	n	%	n	%			
Age							
< 35 years old	37	25.3	109	74.7	0.29	0.15 – 0.56	<0.001
≥ 35 years old	29	53.7	25	46.3			
Training							
No training	41	46.1	48	53.9	2.94	1.60 – 5.40	<0.001
Training	25	22.5	86	77.5			
Skill							
Low	49	53.3	43	46.7	6.10	3.15 – 11.81	<0.001
High	17	15.7	91	84.3			
Leadership Style							
Negative	49	49.5	50	50.5	4.84	2.52 – 9.31	<0.001
Positive	17	16.8	84	83.2			
Insentive							
Low	56	56.6	43	43.4	11.85	5.52 – 25.43	<0.001
High	10	9.9	91	90.1			
Resource							
< 8 midwives	29	45.3	35	54.7	2.22	1.19 – 4.12	0.011
≥ 8 midwives	37	27.2	99	72.8			
Working motivation							
Weak	48	53.3	42	46.7	5.84	3.04 – 11.23	<0.001
Strong	18	16.4	92	83.6			

Table 3. The Result of Multiple Logistic Multilevel Analysis

Independent variables	b	95% CI		p
		Lower Limit	Upper Limit	
Fixed effect				
Age (≥ 35 years old)	-1.41	-2.55	-0.27	0.016
Training (high)	1.35	0.28	2.41	0.013
Skill (high)	2.89	1.44	4.31	<0.001
Leadership style (positive)	2.22	1.03	3.40	<0.001
High incentives ($\geq 1,000,000$)	3.10	1.68	4.50	<0.001
Resource (≥ 8 midwives)	1.17	0.11	2.23	0.031
Work motivation (strong)	1.98	0.82	3.13	0.001
Random effect				
Work environment (good)				
Var (constants)	1.14	0.14	9.26	
N observation = 200				
Log likelihood = - 57.54				
LR test vs. logistic regression, p= 0.039				
ICC = 25.74%				

DISCUSSIONS

1. The effect of age on midwife performance

The variables of this study indicated that the age of midwives ≥ 35 years decreased the possibility of midwives performance which was statistically significant. This was supported by research on the age of midwives who was at risk of reducing the management of postpartum hemorrhage (Rousseau et al., 2016). This was consistent with the study of Nisa et al. (2019) which stated that the age of midwives ≥ 35 years old was one of the factors that influence the decrease in the performance of midwives in the management of post-partum hemorrhage. Midwives with good performance and more work experience have more skilled and agile abilities. In addition, related to the ability of computerization in the process of reporting.

Senior midwives have more diverse innovations in problem solving and were more competent in providing services. This was because it was supported by environmental conditions that provide opportunities for midwives to take part in training and learn from the experience of more senior midwives, but because of increasing age, the performance of midwives often decreased (Adriansyah and Sjarif, 2017).

2. The effect of training on midwife performance

The variables of this study indicated that there was an effect of training on midwife performance in the management of bleeding prevention. Midwives were health personnels who played important roles in health programs, especially for maternal and children health, as an effort to reduce MMR and IMR in measuring health status. One of the factors influencing the performance of midwives was good knowledge because of appropriate education and was balanced with the participation of midwives

in training related to bleeding management (Igarashi *et al.*, 2015).

The training aimed to provide additional knowledge and broaden knowledge related to knowledge in the effort to manage bleeding so as to provide the best service for health through improved performance, but for the assessment of long-term effects on performance, an evaluation of the management of obstetric complications management and performance results was carried out to assess the effectiveness of the training. Kato and Kataoka (2017) explained that the provision of training has a 5.85 times chance to have good performance. Babigumira et al. (2017) explained that there were many factors that influence the management of postpartum hemorrhage including training, supervision, workload, salary, and health facilities that support the management of post-partum hemorrhage.

Training was one of the ways that can be given to develop midwife resources, as a form of formal education for midwives that aimed to improve the capabilities and skills possessed by midwives in dealing with bleeding. The training was conducted in a relatively short period of time compared to education that must be taken in a longer time. Periodic education in training with simulations using clinical scenarios needed to be given in order to improve accuracy in the management of postpartum hemorrhage (Mbachu *et al.*, 2017). The training conducted was expected to increase the authority of health personnels related to management in a particular performance so as to increase their competency. Lack of training provided that some personnels have low competence (Finlayson et al., 2019). Egenberg et al. (2017) also explained that health personnels who were given training related to the handling of labor bleeding were able to improve work

professionalism so that efforts to manage labor bleeding could go according to the standard of intervention that had to be done.

3. The effect of skill on midwife performance

The results of this study indicated that there was an influence of skills on the performance of midwives in the management of bleeding prevention. One of the factors that influenced performance was skill. Work skills were the totality of workers, both physically and mentally in carrying out their work. Physical skills were skills that were obtained from learning outcomes so as to improve work skills, whereas mental understanding can be interpreted as the ability to think in a mature job in the face of existing work (Yulianti, 2014). Skills on midwife performance affect the prevention of bleeding management (Nelissen et al., 2017). Skills in providing effective treatment and good blood loss estimation were important priorities that must be possessed by midwives for the management of bleeding prevention (Vendittelli et al., 2016).

Skills owned by midwives can support the performance of midwives in the management of bleeding management so as to support the success of the labor process (Quinn et al., 2012). Factors influencing the lack of success in the management of the delivery process were influenced by the skills and experience of midwives in efforts to manage bleeding that was still minimal. Skill was one of the factors that influence midwife performance, especially in handling bleeding, so that ultimately can reduce MMR (Than et al., 2019). Improved midwife performance in the management of bleeding associated with a decrease in the incidence of labor bleeding because the midwife was able to work professionally (Kearney et al., 2018).

Brogaard et al. (2019) explained that handling of bleeding must pay attention to the speed in the management of the handling, good time estimation and good collaboration between teams. Very important skills possessed by health personnels, especially midwives. Skills that must be possessed were associated with high clinical skills to improve performance. Non-clinical skills that must also be possessed were vigilance, role determination, and problem solving.

Prata et al. (2011) also stated that important factors for safe delivery management were the knowledge and skills related to labor care and early detection of danger signs of labor was needed to prevent complications during labor, one of them was labor bleeding. Knowledge and skills related to the management of postpartum hemorrhage can be obtained from training (Smith et al., 2016). Based on this, it can be concluded that the results of the study show that skills improve the performance of midwives.

4. The effect of leadership style on midwife performance

The results of this study indicated that there was a significant influence between leadership styles on the performance of midwives in the management of bleeding prevention. Leadership style in handling problems such as bleeding prevention must focus on the planned decision making process and receive input from members of the workers who have collaborated in handling it. A good relationship between workers and leaders was needed so that bleeding problems can be resolved properly.

Adequate health facilities and good management of the leadership were important factors in supporting the successful management of postpartum hemorrhage (Colbourn et al., 2013; Akladios et al., 2014). One of the optimal solutions to problems in a health organization was influ-

enced by the leadership style of the leader so that a good relationship between workers and leaders was created (Sánchez et al., 2018). Leaders' evaluation ability related to performance became the basis of optimally implemented service systems, training was usually given to improve workers' skills (Ellard et al., 2014).

Brogaard et al. (2019) explained that in an effort to manage bleeding in a collaboration, a good leadership style was needed so that bleeding could be resolved immediately and could reduce maternal mortality. Leadership style required good two-way communication so that collaboration was able to solve the problem being faced, especially related to bleeding that required immediate handling so the estimated time must be considered. This study showed that the lack of a good leadership style due to the inability to communicate with work teams has a 0.97 times chance for a decrease in performance. This was in accordance with the idea of Saleh (2016) which explained that the leader must have a democratic leadership style, because the authoritarian leadership style can cause losses, among others in the form of an atmosphere of rigid, tense, gripping, and frightening so that it can further involve in the emergence of dissatisfaction which has an impact on performance degradation. Based on this, it can be concluded that leadership style influenced the performance of midwives in the management of bleeding prevention.

5. The effect of incentive on midwife performance

The results showed a significant influence between incentives on the performance of midwives in the management of bleeding prevention. Incentive was one of the determinant factors that affect the performance of bleeding management. Incentive was one of the forms of salary, wages and awards

that can be given to employees who contribute in achieving company goals. Providing high and relevant incentives when employees work would affect employee's performance (Babigumira et al., 2017).

Providing incentives was needed to support the performance of the employees so that they always work optimally according to their abilities. The role of incentives was very large in forming potential employees. The factor that caused the decrease in work motivation was the low incentives provided (Ponasti and Dewi, 2014). Form of encouragement or stimulation so that employees were able to work well was by providing incentives of proportional amount and according to career path. Incentives were needed to spur the performance of employees so that they were always optimal according to their abilities.

This study showed that increasing the provision of incentives in the form of material increased the performance (Sanghvi et al., 2006; Hapsari, 2012). Based on the description above, it can be concluded that incentives affected the performance of midwives in the management of bleeding prevention.

6. The effect of resources on midwife performance

The results showed there was a significant effect of resources on the performance of midwives in the management of bleeding prevention. Resources in service activities were necessary, one of them was to create cooperation for maximum service delivery (Kusuma et al., 2016). Resources were factor in improving the performance of midwives in the management of bleeding prevention (Mbachu et al., 2017). Kato and Kataoka (2017) explained that the existence of teamwork in efforts to manage bleeding would improve the performance of health personnels because health personnels were

focused and responsible for the tasks assigned.

Letchworth *et al.* (2018) explained that with the appropriate resources in the management of bleeding, it was expected to be able to collaborate in order to provide maximum treatment in accordance with the case and avoid emergencies while carrying out tasks, so that performance in the management of bleeding prevention can be carried out properly. Ford *et al.* (2015) explained that prevention of labor bleeding must be done as early as possible to reduce the possibility of blood transfusion interventions. Studies showed that the need for blood transfusion increased with the enhancement in the incidence of labor bleeding, so that adequate health personnels were needed to provide the best treatment to prevent other problems due to the occurrence of bleeding.

Adequate resources must also be supported by training and good health facilities (Williams *et al.*, 2019). Based on the description above, it can be concluded that the results of the study indicated that resources improved the performance of midwives in the management of bleeding prevention.

7. The effect of work motivation on midwife performance

The results showed a significant effect of work motivation on midwife performance in the management of bleeding prevention. Good motivation can increase satisfaction, both on the part of workers and leaders, and improve performance (Marfu'ah *et al.*, 2016). Motivation needed was different for each individual, work motivation can be influenced by other staff members in a community unit so that the support of work partners was something that needed attention (Beek *et al.*, 2011). Freeney and Fellenz (2013) explained that work motivation for health personnels (doctors, nurses, and

midwives) was an important thing that must be grown. High motivation would affect the quality of service so that it can improve better performance.

The low performance of midwives can be caused by several things, including low midwife work motivation. Motivation consisted of 3 (three) aspects, namely need for power, need for achievement and need for affiliation. Work motivation related to aspects of need for achievement must be increased because it affected the performance of midwives. Work motivation can be used as a strategy to improve the performance of health personnels which in this case related to the performance of midwives (Adriansyah and Sjarif, 2017).

8. The effect of work environment on midwife performance

The results showed a significant effect on the work environment on the performance of midwives in the management of bleeding prevention. The results of the study with multilevel analysis showed that ICC= 25.74%. The indicator showed that the working environment in each health center has an environmental effect on the variation of midwives' performance in prevention procedures by 25.74%, so the environmental influence of the work environment was very important to consider.

The work environment would greatly affect the performance of the workers themselves so that they were required to have a good work environment. A good work environment was one that fulfilled several aspects such as: lighting, noise, temperature, ventilation, vibration, radiation, humidity, odor, and color. These would create working conditions that were effective, comfortable, safe, healthy, and efficient for workers (Tummers and Dulk, 2013).

Ononge *et al.* (2016) explained that for comprehensive hospital services, mana-

gement and a conducive work environment were needed, one of them was useful for early detection and service in the event of emergencies such as labor bleeding. Ayuningtyas (2014) also explained that the performance of midwives in Hospitals, Community Health Center, and Independent Practice Midwives was influenced by good work environment quality. Based on the descriptions above, it can be concluded that the work environment improved the performance of midwives in the management of bleeding prevention.

AUTHOR CONTRIBUTION

Anindyah Tri Lhaksmi Kusuma Wardhani collected, did data analysis, and wrote the manuscript. Uki Retno Budihastuti examined the conceptual framework and methodology. Didik Tamtomo suggested the materials to discuss in this manuscript.

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CONFLICT OF INTEREST

We declared that the authors did not have any conflict of interest.

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