

Knowledge enhancement about pregnancy complications: Optimizing the role of high risk pregnancy prepared cadres

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ABSTRACT Maternal death rate is one of the important health development indicators. Indonesian maternal mortality is still high due to both direct and indirect causes that occur during pregnancy and childbirth. High-risk pregnancy can present complications for both the mother and fetus, and demands early detection. Early detection requires involvement of the community, health cadre, medical officers, and government. There is a need to increase the community health cadre competency in the detection of pregnancy complications, especially high-risk pregnancy knowledge. This study used a quasi-experimental design without control group to determine the effect of training regarding pregnancy complications on community health worker's knowledge in Wijimulyo, Nanggulan, Kulon Progo, Yogyakarta in October 2018. The research subjects were community health cadre workers chosen by purposive random sampling. There were 43 research subjects who were given pretests, training about complications of pregnancy, and posttests. The instrument used was a knowledge questionnaire about complications during pregnancy that consisted of 23 items with reliability of 0.865. There was significant difference between community health cadre's knowledge about complications of pregnancy at pretest and posttest. These results indicate that training about pregnancy complications increases the knowledge of community health cadre workers concerning complications of pregnancy. Further research is needed to assess community health cadre's skills in making early detection of pregnancy complications.

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1. Introduction

The target of *Program Sehat Indonesia* for 2015-2019 is to improve the health level and nutritional status of the community through health development programs, community empowerment, financial protection and equity of health services.¹ One indicator of health development in the Sustainable Development Goals (SDG) is the Maternal Mortality Rate (MMR). According to the Intercensal Population Survey (SUPAS) data in 2015, the number of Indonesian MMR was still high at 305/100,000 live births.² Maternal mortality is caused by direct causes including bleeding (28%), eclampsia (24%), and infection (11%), and also caused by indirect causes namely, lack of chronic energy (37%) and anemia

(40%). Other indirect causes are cancer, kidney and heart troubles, tuberculosis or other maternal diseases.³

Yogyakarta is one of the provinces in Indonesia which has a fairly high MMR. In 2011, it was found that there were 56 cases of maternal deaths in Yogyakarta with the main causes of bleeding, eclampsia, and sepsis.⁴ Whereas, the mortality rate of the Yogyakarta provincial capital in 2017 was 84/100,000 live births.⁵ The data showed a decline compared to 2015 which was 125.88/100,000 live births.⁶ In 2011, the number of mothers who underwent treatments for complications was 7.44%.⁴

Kulon Progo is one of the districts in Yogyakarta with a population of 417,570 in 2015.⁷ Based on data from the Kulon Progo District Health Office, MMR in 2016 reached 136.98/100,000 live births (seven cases). That number increased significantly compared to 2015 which was recorded at 38.22/100,000 live

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births (two cases).⁶ In addition, there were still problems with several health indicators, including K4 visit coverage was only 90.24% (from 95% national target), Fe₁ coverage was 91.07%, and Fe₃ coverage was 85.66%.⁷

Nanggulan is one of the sub-districts in Kulon Progo Regency with a population density of 712 people/ km². Based on data from the Kulon Progo Health Office in December 2014, the number of teenage pregnancies in 2013 was 261 people and the number of teenage childbirths was 84 people. The teenage pregnancy rate in 2014 was 206 people with the majority aged 15-19 years. Unwanted teenage pregnancies in the Nanggulan sub-district are the highest in Kulon Progo.⁸ Pregnancy in adolescents increases the risk of low birth weight, premature childbirth, and severe disruption in the development of neonates.⁹

The number of pregnant women in Nanggulan District in 2015-2016 was high, with 476 pregnant women (from 7.67% of pregnant women in Kulon Progo). In 2015, the number of pregnant women in Nanggulan Sub-district who received Fe₁ was 347 people (72.90%) and Fe₃ was 379 people (79.62%). In 2016, there were 381 pregnant women with 29 who (7.61%) encountered chronic energy deficiency and 79 who (20.73%) were considered having a high childbirth risk. In addition, in 2016, the number of married women less than 16 years old in Kulon Progo was 11.96%, while in Nanggulan Subdistrict, there was only one case. Furthermore, the number of married women between 17-21 years old was 46 cases and the number of married women more than 36 years old was 17 cases.¹⁰ The high number of teenage pregnancies increases the possibility of a risky pregnancy in the area.

Kulon Progo Regency Government has implemented various programs to overcome this problem. The community has played a role through community-based health efforts, which includes *Posyandu* (integrated toddler services). The number of *Posyandu* in Kulon Progo Regency in 2015 was relatively high. There was 266 units (27,71%) classified in *Posyandu Purnama* and 597 units (62.19%) classified in *Posyandu Mandiri*.⁷ Nanggulan District has one public health center with basic

accreditation and one private hospital.

Wijimulyo is one of the villages in the Nanggulan Subdistrict which has a high-risk early detection program established by the Nanggulan Public Health Center and the health cadre of the Wijimulyo. The program is called *Kader Kelambu Siti* which means Rescue Group of High Risk Pregnant Women. Early detection of high-risk pregnancies is needed to determine the specific care that will be provided, so that the condition of the mother and fetus are safe. Copland conducted a high-risk pregnancy assessment based on reproductive history, medical history or surgical history, and current pregnancy conditions.¹¹

The cadre of *Kelambu Siti* in Wijimulyo has a visit reporting format containing demographic data of pregnant women (name, address, HPL, mother's age, type of risk, husband's name), date of visit, results of visit, report date, report recipient filled in by the health cadres and reported to Nanggulan Public Health Center staffs. However, the report format used is still very simple and some health cadres are still new, therefore they have never received a training/seminar/material related to the role of the cadre in the detection of signs of pregnancy complications in high-risk pregnant women. The health cadres can play a major role in improving maternal and child health by helping to monitor and make early detection of pregnancy complications. Therefore, it requires a knowledge enhancement about pregnancy complications to improve early detection efforts of maternal and child health problems. The optimization of the role of health cadres in *Desa Bunda Siaga* is expected to encourage the area of Wijimulyo to be a Healthy, Inspirational, Safe and Responsive Village for Mothers and Children particularly toward one of the maternal health problems, that is high-risk pregnancy. The objective of this study was to know the effect of training concerning pregnancy complications on knowledge enhancement of health cadres about pregnancy complications in Wijimulyo, Nanggulan, Kulon Progo, Yogyakarta.

2. Method

This research was a quasi-experimental study with non-equivalent (pretest and posttest) without

control group design. It aimed to know the effect of training concerning pregnancy complications on knowledge enhancement of health cadres about pregnancy complications in Wijimulyo, Nanggulan, Kulon Progo, Yogyakarta which were conducted with community service activities held by the Department of Nursing, Faculty Of Medicine, Public Health and Nursing, Universitas Gadjah Mada titled, "Optimizing the Role of *Posyandu* Health Cadres in the Establishment of *Desa Bunda Siaga* on High Risk Pregnancy in Desa Wijimulyo, Nanggulan, Kulon Progo, Yogyakarta" in October 2018. The study was conducted with primary data analysis of pretest and posttest scores of maternal health cadre knowledge about pregnancy complications.

The samples chosen had fulfilled the criteria and were selected by purposive sampling during October 2018. The number of cadres who attended the training activities were 44 people, but there was one who was late in the activity so she did not take the pretest and then was excluded. The respondents were 43 maternal health cadres randomly selected from 11 hamlets in the Wijimulyo Sub-District, Nanggulan, Kulon Progo based on predetermined inclusion and exclusion criteria. Nanggulan District's number of high-risk pregnancy was high. Wijimulyo is one of the villages in Nanggulan Subdistrict which has a high-risk early detection program that was developed by the community and Nanggulan Public Health Center. The inclusion criteria were: (1) the individual was active as a cadre in the field

of maternal and child health in Wijimulyo, (2) willing to be a respondent and following the intervention until completion. The exclusion criteria were cadres who were ill and unable to answer the questionnaire properly.

The respondents were given treatments in the form of a pretest (Figure 1), three sessions of training concerning complications in pregnancy (Figure 2), and a posttest after the training was completed. The pretest and posttest were conducted for 60 minutes. The material presented was the physiology of pregnancy and childbirth preparation, postpartum care, and high-risk pregnancy and pregnancy danger signs delivered by two speakers from the Department of Nursing, Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Yogyakarta, Indonesia.

The questionnaire used for the pretest and posttest was a questionnaire compiled by Handayani in 2010 in her research titled, *Hubungan Pengetahuan Ibu Hamil tentang Komplikasi Kehamilan dengan Sikap Ibu Hamil terhadap Komplikasi Kehamilan dan Deteksi Dininya di Puskesmas Seyegan, Sleman, Yogyakarta* (Relationship between Knowledge of Pregnant Women about Pregnancy Complications and Their Attitudes of Against Pregnancy Complications and Detection of Their Forms at Seyegan, Sleman Public Health Center, Yogyakarta). The questionnaire consisted of 23 items with a choice of right and wrong answers. Each favorable question is worth 1 score for the "right" answer and



Figure 1. Pretest before training activities



Figure 2. Training activities on pregnancy complications

0 for the “wrong”. The total score ranges from 0-23. The knowledge is categorized into three categories namely: less knowledge if <8, adequate if 8-15, and good if ≥16. The questionnaire had been tested for validity by Pearson product moment’s test and reliability by Alpha Cronbach’s test with the reliability of the instrument at 0.865 which was classified as very high. The data were analyzed by univariate and bivariate analyses using computer programs. This activity had received the approval from the Medical and Health Research Ethics Committee of the Faculty of Medicine Universitas Gadjah Mada with Ref: KE/ FK/1342/EC/2018.

3. Results

3.1 Respondents’ characteristics

The total number of respondents who participated in the training about pregnancy complication was 43 persons. Table 1 shows the respondents’ characteristics.

The respondents’ average age was 43.47 and average time as a cadre for 9.95 years (Table 1). Most of the respondents had higher educational background (72.1%), unemployed (79.1%), had not obtained the information about the role of being cadres and maternal and child health (76.7%), and had obtained the information about the role of being cadres and maternal and child health from seminar or training (67.4%) (Figure 3). Figure 4 shows that 2.33% of the health cadre had a lack of knowledge, 32.56% had good knowledge and 65.12% had adequate knowledge before the training.

3.2 Knowledge enhancement on pregnancy complications

The results of the normality test using Shapiro-Wilk tests showed that the pretest data were normally distributed ($p = 0.179 > 0.05$) while the posttest data were not ($p = 0.000 < 0.05$). Table 2 shows the result of the Wilcoxon test, which obtained a significance value of $p = 0.000 (< 0.05)$, thus it can be concluded that there was a significant difference in knowledge about pregnancy complications between before and after receiving the training on pregnancy complications. As seen from the comparison of the average knowledge score at the posttest and the

pretest, it was found that there was an increase in the health cadres’ knowledge score about pregnancy complications in the posttest compared to the pretest with an average increase of 6.84 ± 3.154 .

3.3. The relationship between respondents’ characteristics and knowledge enhancement

The results of the normality test for knowledge enhancement were normally distributed ($p = 0.327 > 0.05$), age was normally distributed ($p = 0.163 > 0.05$), and the duration for being a cadre was abnormally distributed ($p = 0.000 < 0.05$). Table 3 shows that the results of the correlation test between knowledge enhancement and the duration for being a cadre with Spearman rho analysis obtained $p = 0.096 (> 0.05)$, which means that there was no significant relationship between being a cadre and knowledge enhancement during the training. The results of the correlation test between knowledge enhancement and age with Pearson’s test obtained $p = 0.135 (> 0.05)$, which means that there was no significant relationship between age and knowledge

Table 1. The respondents’ characteristics based on ages and the duration for being a cadre

Characteristics	Mean ± SD	Minimum-maximum
Ages	43.47 ± 8.169	25-57
Duration for being a cadre	9.95 ± 9.371	0-31

Table 2. The score comparison between pretest and posttest on pregnancy complications knowledge

Variable	Score (Mean ± SD)		Δ Mean	p-value
	Pretest	Posttest		
Knowledge on Pregnancy Complications	14.37 ± 2.928	21.21 ± 11.846	6.84 ± 3.154	0.000*

*Wilcoxon Test

Table 3. Knowledge enhancement based on ages and the period for being a cadre

Variables	Knowledge enhancement
	p
Age (years old)*	0.135
The period for being a cadre (years)**	0.096

* Pearson; ** Spearman’s rho

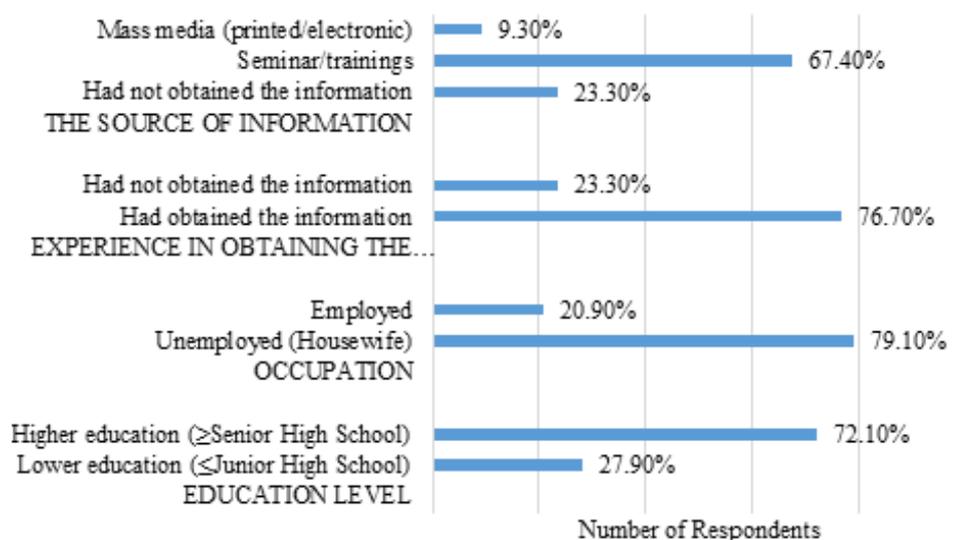


Figure 3. Participants’ characteristics based on education level, occupation, experience in gaining information about the role of being cadres and maternal and child health, source of information about the role of being cadres and maternal & child health that has been obtained

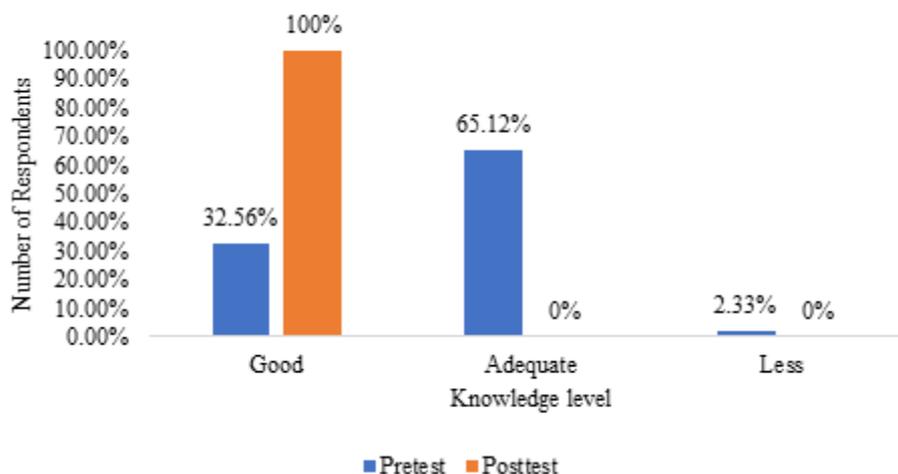


Figure 4. Description of respondents' knowledge before and after given training about pregnancy complications

enhancement during training.

Table 4 shows the differences in knowledge enhancement about pregnancy complications based on the characteristics of respondents in education levels, occupation, experience in obtaining information about the role of cadres also maternal and child health, and sources of information that had been obtained. It was found that there was a significant difference ($p = 0.041 < 0.05$) between the

knowledge enhancement from respondents who had a higher and lower educational background, with mean difference of 2.31.

4. Discussion

High-risk pregnancy is a condition that threatens the safety of both the mother and fetus, and some of the concerns is pregnancy less than 19 years or more than 35 years.¹³ Delay in handling high-risk

Table 4. Knowledge enhancement based on education, occupation, experience in obtaining the information, and source of information that was obtained

Variables	Knowledge enhancement		p
	Mean ± SD	Δ Mean	
Education*			
Lower education (≤JHS)	5.17 ± 2.691	2.31	0.041
Higher education (≥SHS)	7.48 ± 3.118		
Occupation*			
Unemployed	6.62 ± 3.201	1.05	0.557
Employed	7.67 ± 3.000		
Experience in obtaining the information*			
Had not	7.70 ± 3.713	1.12	0.111
Had	6.58 ± 2.979		
Sources of information that have been obtained **			
Had not	7.70 ± 3.713	0.94 (had not and seminar/training)	0.131
Seminar/training	6.76 ± 3.101	2.45 (had not and mass media)	
Mass media (printed electronics)	5.25 ± 1.500	1.51 (seminar/training and mass media)	

* Mann-Whitney; ** Kruskal Wallis Test; Junior High School (JHS), Senior High School (SHS)

pregnancies can also cause a danger to both the mother and fetus.¹⁴ There has been no effort to empower the community to encourage high-risk early detection of pregnancy or government financial support for the implementation of early detection by the community.¹⁵

Wijimulyo, Nanggulan, Kulon Progo, Yogyakarta has initiated a collaborative program between Nanggulan Community Health Center staff and health cadres by forming a *Kader Kelambu Siti*, namely the Rescue Group for High Risk Pregnant Women. *Kader Kelambu Siti* is a cadre who gets debriefing and mentoring from health officers from the Public Health Centre to document pregnant women at risk of complications in the area where they live. Furthermore, the health cadre reports the data on high-risk pregnancy cases to the Public Health Centre. After finding out about high-risk pregnancy cases, the health cadres were given the task of conducting home visits and motivating clients to carry out antenatal care. The actions taken by cadres during the visit are to record the age of the mother and complaints during pregnancy, then report the results to the responsible health officers.

Antenatal care is one of the pillars of the WHO safe motherhood program in the mother-baby package since 1994. Antenatal care must be done early to ensure that mother and fetus are safe and have no problems. Pregnant women are

recommended for examinations at least 4 times during pregnancy, starting from <12 weeks of gestation for a normal pregnancy (low risk). The WHO recommends that health officers should be able to work with community leaders to ensure public understanding of the benefits of prenatal care. Interventions to improve the understanding of community leaders are needed, so that pregnant women would be more likely to carry out pregnancy checks.¹⁶

The health cadres are people who voluntarily help health programs in their neighborhoods and work together with the local Public Health Centre. The formation of competent cadres who are realizing the existence of pregnancy cases and that comprehend complications risk and knowledge about the dangers of pregnancy, can help in increasing people's motivation to routinely check their pregnancy. The cadres are individuals of the community who understand health and their position is very close to the community, making it easier to provide health information. In addition, the health cadres are better in understanding the characteristics of the community in their environment, so that they can deliver health information in accordance with cultural conditions, hence it can be more easily accepted and implemented.

Skills improvement and fulfillment of facilities are needed by Female Community Health Volunteers

(FCHVs) in early pregnancy detection support in making appropriate referrals to reproductive health services. FCHVs requires networks to be able to carry out detection and referrals. Therefore, they need the availability of facilities and awareness about the availability of appropriate health care facilities.¹⁸ With appropriate training, Community Health Workers (CHWs) are enabled to work with health officers to improve the health status of vulnerable populations. It is known that pregnant women who had been accompanied by CHWs said that their health behaviors had received feedback and they were feeling an increase in health care.¹⁹

Appropriate health promotion training can help to improve cadre's knowledge and skills in promoting the health of pregnant women (for example: counseling) and change their attitudes towards pregnant women during integrated toddler service activities. They feel more confident in negotiating health principles and the importance of prenatal care and childbirth with health officers. They will get appreciation from the community for carrying out their duties very well, and this further motivates cadres to continue in improving the quality of their services. It needs to be a participatory approach with ongoing supervision to evaluate changes and sustainability of health programs.

The establishment of the *Kelambu Siti* cadres who help in documenting high-risk pregnancy cases is a large investment that is owned by the village. However, there is a change in cadres due to age, thus not all cadres who are currently in charge of this responsibility are used to making high risk pregnancy detection. It can be seen from the results of the analysis, that 23.30% of respondents had never received health information about high-risk pregnancies, either through seminars, training, or mass media (printed or electronic). The experience in obtaining health information affects the knowledge and skills of the health cadres in providing health services at the integrated toddler service.

A counseling training could increase the knowledge and skills of the community health cadres. In addition, it was found that there was also an increase in the number of pregnancy visits after they experienced a knowledge enhancement.

The health cadres from the local community are able to increase the tendency of pregnant women to conduct examinations because they are native people who have a good understanding of lifestyle and community beliefs, especially religious and cultural principles, which may affect the attitudes and knowledge of pregnant women regarding prenatal care. Notwithstanding, there are some of women who get late pregnancy examination because they think their pregnancy was normal, do not understand the benefits of pregnancy examinations, experience shame, and fear the cultural influence of supernatural powers. Therefore, an ongoing training and supervision are needed for the health officers and the community involved.¹⁶

The respondents in this activity received training on pregnancy complications that was done in a form of lecture methods and power point media along with guidebooks for cadres. It was found that there was a significant increase in the knowledge score about pregnancy complications in the posttest score compared to the pretest with an average increased score of 6.84 ± 3.154 . It is believed that the use of appropriate methods and media would support the learning process.²¹ With the lecture method, the presenters could deliver the material effectively and did not need to bring a lot of assistive devices/visual aids, besides they could also emphasize the important aspects with personal sharing.²² In addition, with the lecture method the presenters could explain many important points, while the programs are easy to implement and could be followed by a large number of participants.²³

There is a relationship between a person's level of education towards knowledge about danger signs in pregnancy. In this activity, most of the respondents (72.10%) had higher education. Education is known to form a person's attitude to be more positive in receiving information.²⁴ Education is an important factor to facilitate understanding of health information from various different sources. In addition, education also increases one's autonomy regarding reproductive health issues and the use of health care because it can increase one's awareness of health conditions.²⁵ However, one also can obtain knowledge from formal and informal education.²⁶

From the results of data analysis, it can be seen that there was no significant difference in the increase in respondents based on age characteristics, length of time being a cadre, employment, experience in getting information, sources of information that had been obtained. This is not in accordance with some of the previous theories which stated that age is known as one of the factors that influence a person's perception and mindset, therefore growing older could affect the development of thinking and create a better knowledge perception.²⁷ The average age of cadres who participated in cadre training in this activity was 43.47 years, with the youngest age of 25 years and the oldest was 57 years.

Knowledge can be formed through a process of reciprocal interaction between individuals and the environment.²⁸ According to Notoatmodjo, in one's work it is possible to interact with others, so it encourages someone to increase their knowledge.²⁹ In this activity, most of the respondents (79.10%) were unemployed or housewives. However, even though the majority of respondents were unemployed, they had many opportunities to interact through various activities in the community because of the prevalent culture of mutual cooperation.

Most respondents stated that they had received material on maternal and child health from seminars/training (67.40%) and printed/electronic from mass media (9.30%). The presence of several cadres (23.30%) who have never received maternal and child health material was probably because they had not been assigned as cadres for a long time. It shows the need for the community to hold material refreshment activities for cadres, so that older cadres can recall the information and the younger ones can get provision in carrying out their duties. Although not all health cadres had received material on maternal and child health, currently cadres can access most information from mass media or social media. Nowadays, people can access various kinds of information easily and can interact with other people even if they are unemployed.³⁰

Knowledge increases along with the enhancement in one's experience.³¹ The cadres in this activity have had the experience of being a cadre for an average of 9.95 years with the shortest period

of 0 years and the longest was 31 years. Experience provides an opportunity for someone to increase knowledge by repeating the knowledge gained in solving a problem.²⁸ However, the cadre regeneration program is very much needed by the community, therefore the continuity of health service activities by and from the community which are working together with the Public Health Centre is expected to be continued regularly. In that way, the cadres who have just entered can learn together with cadres who have more experience.

Training on pregnancy complications in this research was effective to enhance of health cadres's knowledge. It will assist health cadres in providing home visit services to high-risk pregnant women and assist government programs to conduct early detection of pregnancy's danger signs and reduce maternal and neonatal mortality. Due to some time and financial constraints, there were some limitations in this study, including the lack of knowledge retention follow-up after the training.

5. Conclusion

Most of health cadres' knowledge on pregnancy complications before training was adequate and increased afterwards. There was a significant increase in cadres knowledge score about pregnancy complications after training. Conducting further research is suggested to examine cadres' knowledge and skills in early detection of pregnancy complications immediately after the training was done, and the retention of knowledge following the training.

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