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ORIGINAL RESEARCH

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CADRES COMPETENCE IN COMMUNITY-BASED MANAGEMENT OF CHILD ILLNESS IN BANYUMAS DISTRICT, CENTRAL JAVA, INDONESIA

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Abstract

Background: One of the efforts in the health sector for programs to reduce infant and under-five mortality and morbidity rates is by the competence-based integrated management childhood illness (CB-IMCI) program. However, the program has been poorly implemented by health workers at the health center. Thus, the involvement of cadres is needed and their competency remains important to be improved.

Objective: To quantitatively analyze cadre knowledge and competencies in the CB-IMCI program, and its relationship with the implementation of CB-IMCI, as well as to qualitatively explore and analyze the responses of cadres, health workers, and the community to the addition of cadre roles to the management of sick children.

Methods: This was a mixed methods study with randomized controlled trials and qualitative method. For randomized controlled trials, 100 cadres were selected, which 50 randomly assigned in the intervention and control group. And for quantitative methods, informants included 10 cadres, 4 health workers, and 20 mothers. Paired t-test and independent t-test were employed for quantitative analysis, and triangulation was used for qualitative analysis.

Results: The improvement of knowledge in the intervention group was better ($I=14.42/C=4.44/p\text{-value } 0.00$). The intervention group was more competent in the management of child illness ($p\text{-value } 0.00$). In addition, the cadres have additional competencies assisted by health workers to confidently detect cases earlier, and health center services reach a wider coverage in the community.

Conclusion: The addition of cadres' roles and competencies in the management of child illness in the community can be implemented in Banyumas District. It is suggested that the implementation of this program should be followed up in other health centers by the Health Department of Indonesia.

Keywords: cadre; competence; integrative management; child illness; community

INTRODUCTION

The sustainable development goals (SDGs) program is developed as an effort to address the challenges of globalization that demand the quality of human resources in the world. The challenges of globalization need to be addressed by the world community ([Bappenas, 2015](#)). The SDG's development by the

community at the world level follows the commitments that have been agreed, with the hope of improving the quality of human resources to answer increasingly complex challenges. The SDG's are programmed through a vision up to 2030 by considering

economic factor, social, environmental and governance conditions ([Albert, 2015](#)).

In Banyumas District, according to 2013 data, the number of cases of diarrhea as an endemic case is still quite high, reaching 46.5%; pneumonia 21.4%; and less nutrition 7.82%. Previous study ([Nguyen, Leung, McIntyre, Ghali, & Sauve, 2013](#)) stated that the performance of officers who received integrated management of childhood illness (IMCI) training about medication, vaccination, and nutritional counseling was better than those who did not receive the training. The most visible effect is about nutritional counseling. According to the WHO the neonatal mortality rate in Indonesia was still the highest among ASEAN countries with a relatively very slow decline every year. The neonatal mortality rate is 31 per 1,000 live births (5.2 times compared to Malaysia; 1.2 times compared to the Philippines; and 2.4 times compared to Thailand). This situation is caused by the main cause of death, which can actually be prevented by early detection and appropriate management. According to MDG's in 2015, a decrease in the infant mortality rate is in line with a target of 17 / 1,000 live births and a toddler mortality target of 23 / 1,000 live births. Nevertheless, the trend in under-five, infant and neonatal mortality rates has declined in line with various strong government efforts through community empowerment and health workers ([Banyumas District Health Office, 2014](#)).

One effort in the health sector for programs to reduce infant and under-five mortality rates and to minimize child morbidity is by the integrated management childhood illness (IMCI) program. The IMCI has been applied by health workers at the health center. However, obstacles in the implementation of IMCI become a national problem, namely the limitations of labor and time ([Horwood et al., 2009](#)). This situation requires problem solving in order to achieve the IMCI program that can be felt by the community in the form of improving health services and public awareness for health. Based on the evaluation of the IMCI program, community participation

is needed to actively participate. Cadres are assessed as the most appropriate personnel to assist service performance at the community level as an extension of health workers through the integrated service post program.

Involvement of active participation of the community in neonatal, infant and toddler health services based on standards is through the implementation of community-based integrated management of childhood illness (CB-IMCI). CB-IMCI is an integrated approach to health services for infants and toddlers by involving the community in accordance with IMCI standards. The service by cadres is under the supervision of community health center officers through promote and preventive approaches ([MOH, 2013](#)). The involvement of community participation through the role of cadres can be carried out if there are sufficient numbers of cadres.

Communities need adequate education, so as to provide the power to care for children, health education is the key to practicing correctly how to manage sick children ([Agha, Younus, Kadir, Ali, & Fatmi, 2007](#)). The management of sick children is applied to prevent illness and reduce child mortality. Banyumas Regency has 2,508 integrated service post, which 2,484 integrated service post (99%) are active. This is a good potential to support the CB-IMCI program. Integrated service post is managed by cadres under the guidance of community health center ([Banyumas District Health Office, 2014](#)). Knowledge improvement for cadres is one of the important steps to help the community through basic promote, preventive and curative efforts. Increased knowledge is expected to change people's behavior for health awareness, both for themselves and for others. Awareness of healthy behavior by the community can be seen from the community's efforts to practice and maintain individual and environmental health in their daily lives.

Development of health efforts originating from the community, such as integrated service posts, protein energy deficiency reduction,

nutrition education, provision of clean water facilities and basic sanitation, as well as prevention and eradication of diseases through surveillance and immunization as well as mother-to-child class activities in an effort to improve family independence and the community in caring for and maintaining the health and growth of children under five ([Banyumas District Health Office, 2014](#)). It is necessary to monitor public health efforts from health workers to the community level, because these efforts have not been evenly applied. Active community participation is needed to improve the health status of the community.

The role of nurses to succeed in CB-IMCI programs is needed to assist the cadres in carrying out their activities. According to the Nursing Law No. 38 of 2014 ([Presiden Republik Indonesia, 2014](#)), the role of nurses in this regard is as a provider of nursing care, health counselors, collaborative activities with other health workers, managers of nursing services, researchers, and carrying out tasks in accordance with the authority of delegation of duties. Nurses and health workers are also responsible for the percentage of low IMCI coverage. Based on data ([Banyumas District Health Office, 2014](#)), the lowest percentage of IMCI coverage was 37.87%, namely in the working area of South Purwokerto Health Center. Of the 39 community health centers, there are 17 community health centers that have not met the target of achieving 90% of IMCI coverage, which neonates were covered only 31%. Two health officers who are implementing the IMCI also said that due to the limited number of staff, IMCI could not be implemented effectively. If possible, IMCI can involve the participation of the community and health cadres. Cadre activity is limited to weighing toddlers in integrated service post and distribution of vitamin A. Cadres, in terms of number and activeness, potentially provides opportunities for CB-IMCI implementation. The development of cadre capacity in the management of childhood illness is applied as an effort to resolve dominant problems that arise in the region, including cases of diarrhea, pneumonia and malnutrition. The form of

cadre capacity building is adjusted to the cadre's basic competencies according to the ([MOH, 2013](#)), including identification of common hazards in sick toddlers, determining the age group of children (infants and toddlers), recognizing signs of pneumonia, fever, and malnutrition. However, a number of these competencies are trained in cadres.

METHODS

Study Design

This study used a mixed methods approach, which is a mixture of quantitative and qualitative approaches ([Andrew & Halcomb, 2009](#)). Mixed methods approach with experimental design, namely designing basic mixed methods in an experiment, in which researchers add data collection, data analysis, and qualitative results into an experiment ([Creswell & Creswell, 2017](#)). The first stage uses a quantitative approach to analyze cadre knowledge and competencies in the management of sick children in the community, both in the intervention group and control group, and the relationship between the competence of cadres in the intervention group and the frequency of implementation of CB-IMCI. The second stage is a qualitative approach to explore and analyze the responses of cadres, health workers, and the community to the addition of cadre roles to the management of sick children. Data on the frequency of implementation of management of sick children in the community were collected in the second stage.

Quantitative approach

The study design used randomized controlled trials (RCTs). Randomization using cluster randomized trial method. The study method was controlled using the 2010 consort guidelines statement: extension to cluster randomized trials. The standard used focuses on parallel reports of groups of participants involved in the study, namely the selection of cluster groups aims to minimize contamination between individuals involved in the study ([Campbell, Piaggio, Elbourne, & Altman, 2012](#)). The research sample was 50 cadres in

the intervention group and 50 cadres in the control group randomly selected from 605 cadres spread across 116 integrated service post (See **Figure 1**). The results of the hypothesis test for two population means sample calculation, obtained 64 samples, the researchers took into account the design effect of 1.5, so that 96 samples were needed rounded up to 100 samples of intervention and control groups. Quantitative analysis of single variable data is used to analyze the description of the characteristics of respondents based on age, education level, cadre work, as well as the description of each variable. Before

determining the type of bi variable analysis, homogeneity test of the two groups of respondents was carried out. Both groups are homogeneous, so that bi variable analysis can be continued using paired t-test analysis to determine differences in average cadre knowledge about cadre capacity before and after intervention. Independent t-test to compare cadre knowledge about cadre capacity and cadre competencies between the intervention group and the control group. In addition, cadre competencies were analyzed with the frequency of MBS-M implementation using line regression analysis

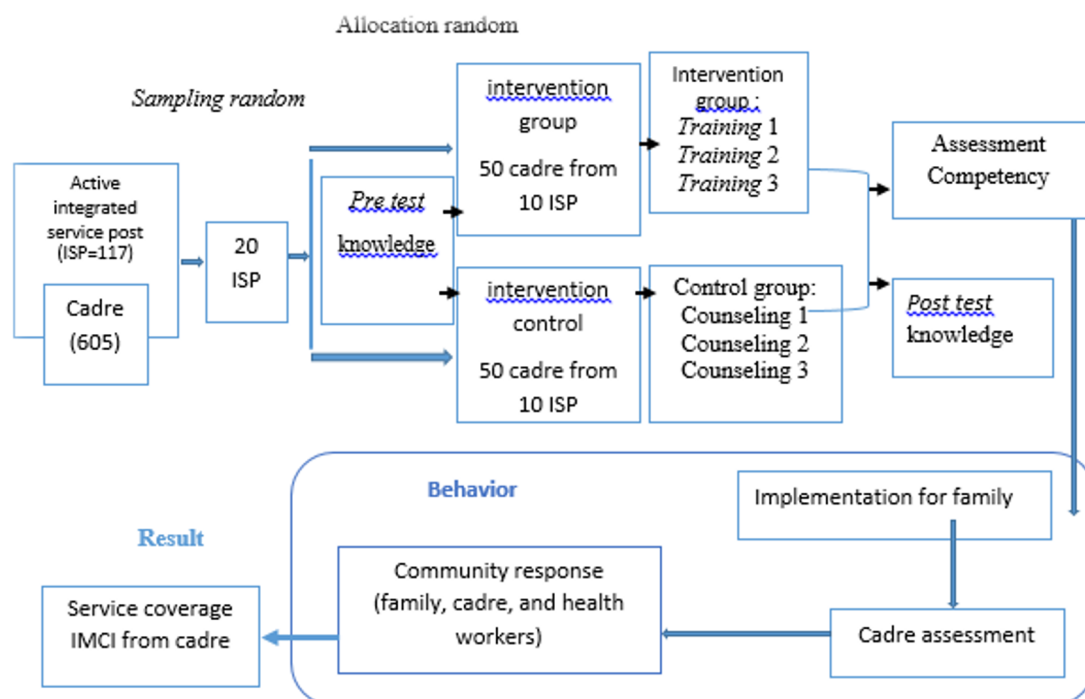


Figure 1 Research design

Qualitative approach

The qualitative method is triangulation. Triangulation is done by comparing information or data in different ways. Researchers use interviews and observations or observations to check the truth. In addition, researchers can also use different informants to check the truth of the information. Through various perspectives or perspectives, it is expected that results are close to the truth ([Speziale, Streubert, & Carpenter, 2011](#)). In this study qualitative data collection using

structured interview methods for informants from health workers and cadres, as well as focus group discussions (FGD) for mother informants. Informants to assess the community's response to the implementation of the management of sick children in the community, consisting of 20 mothers. Informants from health workers were four health center staff and ten cadres. Information from cadres as direct implementers is needed to see the response from additional capacity. Information from health workers is needed to

see their response as a team, which is a place to ask, coordinate, collaborate, and report on activities carried out. Data obtained from the results of structured interviews to informants, made transcripts. Transcript results are selected important data and specified keywords, categories and themes. Furthermore, qualitative data analysis is carried out, based on semantic relationships and basic similarities of relationships. Semantic relationship analysis uses qualitative data analysis (QDA) with Atlas IT computer software.

Setting

The study was conducted in Banyumas District, Central Java, Indonesia, from September 2016 to February 2017.

Ethical consideration

The study was approved by the Institutional Ethics Committee of the Medical and Health Research Ethics Committee (MHREC), Faculty of Medicine Gadjah Mada University-Dr. Sardjito General Hospital, Ref: KE / FK / 1124 / EC / 2016 on 30 September 2016.

RESULTS & DISCUSSION

Characteristics of respondents

Table 1 shows that cadre's knowledge about cadre capacity before intervention with the mean was slightly better in the intervention group than in the control group. Both groups meet the variance of homogeneity requirement because it is supported by a picture of a bell shape like a histogram, a comparison of the skewness value with a standard error of less than two, and the Q-Q description of the plot shows the normal line direction. Distribution of age data is normal, and bell shape histogram picture and Q-Q description plot show homogeneous between the two groups. Most cadres have high school, both in the intervention group and in the control group. However, there are still quite a few who have elementary education, which is doubled in the control group compared to the intervention group. The job status of cadres was more than 90% as housewives in both the intervention group and the control group. The gender of all cadres is women.

Table 1 Characteristics of cadres in intervention and control group

| Variable | Intervention group | | Control group | |
|---------------------|--------------------|----|---------------|----|
| Knowledge (pretest) | | | | |
| Mean | 89.36 | | 88.00 | |
| Min-Max | 75-105 | | 78-104 | |
| Age (year) | | | | |
| Mean | 45.94 | | 48.36 | |
| Min-Max | 25-64 | | 29-71 | |
| | Intervention group | | Control group | |
| | n=50 | % | n=50 | % |
| Educational level | | | | |
| Elementary | 6 | 12 | 12 | 24 |
| Junior high | 10 | 20 | 12 | 24 |
| Senior high | 28 | 56 | 21 | 42 |
| Diploma | 4 | 8 | 2 | 4 |
| Undergraduate | 2 | 4 | 3 | 6 |
| Job status | | | | |
| Housewives | 46 | 92 | 48 | 96 |
| Employed | 4 | 8 | 2 | 4 |

Description of knowledge, competence, and activity assessment

Cadre's knowledge about cadre capacity

As shown in the Table 2, cadre's knowledge of cadre capacity is very good, where cadres

convey that cadre resources in the community are available, strong cadre organization is said to be strong, and the role of government officials and the community is good. Although health cadres have facilitated community involvement, community participation is still

considered limited ([Pranata, Pratiwi, & Rahanto, 2011](#)). Cadre basic knowledge about cadre capacity, which is known from the results of knowledge before the intervention shows remarkable results. This makes it an advantage for cadre's potential for its role in society. The results of the 2014 IMCI program evaluation stated that one of the causes of IMCI failure was due to limited knowledge and skills of officers. The good knowledge of

cadres potentially gives hope for the success of the program. According to ([Nettle et al., 2010](#)), knowledge is one of the factors that determine the change. The increase in cadre capacity in the intervention group was better than the control group. This difference in capacity building is because the intervention group received training that was not only in the cognitive domain of learning, but also the realm of skills and attitudes.

Table 2 Analysis of knowledge, competence, and activity assessment in the intervention and control group

| Variable | Intervention group (n=50) | | Control group (n=50) | | Difference | | 95% CI | p-value |
|---------------------|---------------------------|--------|----------------------|--------|--------------|---------|-------------|---------|
| | Pre | Post | Pre | Post | Intervention | Control | | |
| Knowledge | | | | | | | | |
| Mean | 89.36 | 103.78 | 88.00 | 92.44 | 14.42 | 4.44 | 8.05-11.906 | 0.000 |
| Competence | | | | | | | | |
| Mean | | 40.04 | | 28.04 | | | 10.40-13.59 | 0.000 |
| Activity assessment | | | | | | | | |
| Mean | | 111.96 | | 113.68 | | | 5.03-1.61 | 0.306 |

Cadre competence

Bhutta et al. ([Bhutta, Lassi, Pariyo, & Huicho, 2010](#)) argues that health workers in the community or health cadres with basic education should be recommended, but must be considered related to commitment and competence. The educational level of health cadres in Banyumas District has met the minimum requirements by WHO. The educational level of cadres with the majority of high school students provides convenience in receiving information from health workers. Cadre competence determines the child's age according to the CB-IMCI format is actually not something that is difficult, but for those who have never done it, then calculating the age of the child based on the date of birth and the date of the check becomes difficult. Child age can be asked from parents, more clearly asked the date of birth of the child. After the child's birth date is known, then it can be compared with the examination date. The cadre is more competent in determining the child's age correctly according to the guidelines. Determination of age serves to determine which children are classified as young babies (less than two months) or under five (aged two to five years).

General danger signs are important things that need to be known by the cadre for the determination of early case, which must be referred immediately, or recommended to come to a health worker, or home care. Introduction of common danger signs prevent maternal delays, checking children to the health center. Knowledge of the determination of general danger signs is new to the cadre, so that there is a considerable difference in competencies between those who attend training and those who do not. Therefore, training is needed to master competence in determining common danger signs for babies and children, especially with an educational background not from health sciences. Competence to ask for a child's disease is not a difficult thing for cadres to do, so that even without training cadres can carry it out well. Even so, the intervention group was twice as good, because it was accompanied by exercise. Competence in calculating breathing frequency is an additional competency for cadres controlled by a small portion of the control group. In the intervention group the majority were able to calculate the frequency of breathing well, easy for cadres who practiced.

According to the IMCI guidelines ([UNICEF, 2016](#)), simple cough handling to relieve cough and relieve throat can be done with safe ingredients. Safe ingredients that can be used exclusively for babies up to the age of six months and sweet soy sauce or honey mixed with lime juice (honey is not recommended for children less than one year). Cadres easily accept the information and the recommended ingredients are easy to obtain. Assessment of diarrhea children, according to the Ministry of Health of Republic of Indonesia ([MOH, 2011](#)), is by asking for the duration of diarrhea, the frequency of a day, the presence or absence of blood in the stool, vomiting or not, there or no other diseases; seeing the general condition of the child, conscious or not, weakness, anxiety, laziness to drink, sunken eyes, and skin turgor. In this study, cadres were able to determine when the child was referred to the health center by asking the length of diarrhea and seeing whether there were sunken eyes, able to determine the child with diarrhea to get oralyte for children and continue breastfeeding for the baby. Cadres do it in accordance with the Ministry of Health procedure in a simple way to handle the initial cases in the community.

Cadres are able to provide oralyte with the right composition, and able to explain it by gradual giving, which must be done if vomiting, and how to administer electrolyte according to the age of the child. According to the Ministry of Health of Republic of Indonesia ([MOH, 2011](#)), the way to prevent dehydration of diarrhea children before being taken to health facilities is by providing oralyte; if there is none, household fluids such as starch, vegetable soup, fruit juice, tea water, boiled water, and other are given. Cadre recommends oralyte can be replaced with salt sugar solution.

The right and effective way to prevent chronic diarrhea is to keep breastfeeding exclusively for six months and continue for two years, providing complementary foods for age, providing clean water, washing hands with water and soap before eating and after defecating, defecating in the toilet, throwing baby's stool in place, and measles

immunization. Information provided by cadres on diarrhea prevention, not as complete as the MOH guidelines, but information about preventing dehydration before being taken to health facilities is correct.

In the case of children with fever, cadres are able to determine when to be taken to a health facility, able to compress and teach the correct compress to the mother, and able to identify the cause of fever in infants accompanied by redness of the umbilical cord. The cadre is able to explain the provision of nutrition to infants filled with exclusive breastfeeding for six months and continued for up to two years with the addition of gradual feeding. The cadre asks the mother about toddler nutrition. The questions asked include the child's diet, the person who gives it, and the way of feeding. The cadre also provided information about giving the right food, was able to recognize the signs of malnutrition in children, and also advised mothers to consult the health center staff if there were signs of malnutrition in children. The role of the nutrition staff in health center is visiting the community and giving motivation to the community is very important ([Sihombing, Kandarina, & Sumarni, 2016](#)).

The cadre gives advice to the mother at home to keep breastfeeding the baby, and continuing to provide food and drink to the child as well as giving the recommendation is to check again if there is a danger sign for the sick child, or if after three days the child's condition does not improve. Cadres carry out their activities in accordance with the mandate of the Indonesian Ministry of Health. The results of Wijaya's research ([Wijaya, 2014](#)) stated that there were changes in cadres in improving competencies regarding maternal and child health after participating in gender-based participatory training. However, it is not specifically explained all the competencies referred to in the scientific publication. The addition of knowledge to cadres is very important to increase his/her confidence in implementing in the community, as an extension of health workers in the community.

Description of activity assessment

Participants in training and counseling activities provide good value for training and extension activities. The assessment approached the same, which was happened because of the enthusiasm of the cadres to join the program package of activities from the health center. Assessment of this activity includes assessing facilities, materials, instructors, and methods of training or counseling. Assessment of good activities for both treatments provides information that cadres really need additional knowledge about health. The six-hour training time for each period and counseling is only three to four hours. Longer training time allows fatigue for trainees, so that cadres give a slightly lower process value compared to the other cadre group. Although the difference is not significant, the spirit of the cadres in participating in the activities provides more colors according to the character of Banyumas residents. According to ([Priyadi, 2003](#)), the individual characters of Banyumas residents are feeling glory, in terms of additional knowledge and enthusiasm for hard work, so that both provide positive values. The spirit of hard work is usually supported by older people who feel experienced, parents give examples of their experiences with full struggle "*sikil nggo endhas, endhas ngil sikil*", which has the meaning of trying to integrate the work of the brain and the work of muscles.

Relationship between cadre competencies and CB-ICMI coverage

The relationship between cadre competence in the intervention group and the scope of cadre implementation in the management of sick children in the community shows a weak or no relationship. The increase of the cadre's competence does not guarantee more coverage of cadre implementation in the management of sick children. Cadres apply the procedures of sick children in the community based on the incident cases encountered. Although competent, but when they did not find a case, then no cases were reported. Likewise, even though they are not yet accustomed to implementing one of the competencies, if there is a case, then the cadre tries to study the case,

or consults the health worker at the health center by telephone or SMS.

Response of officers and the community on cadre roles*Health workers feel helped by the addition of cadre capacity*

The addition of cadre capacity with competency in the management of childhood illness in the community is considered positive by health workers. The positive value is the help of health workers by cadres towards early case discovery so as to prevent delays in handling both cadres and health workers. Cadres immediately report to the responsible of health center officers when they encounter cases of malnutrition in children. Cadres motivate immunization in infants, provide advice at home, and report cases of cough and diarrhea being treated. This can be done well because cadres have good competency and commitment to implement the management of sick children in the community. Cadre's competence that supports the performance of health workers in health centers is the competence to provide advice at home, calculate the frequency of breathing, inform toddler nutrition, exclusive breastfeeding, inform general danger signs check on toddlers, examine common danger signs in infants, simple handling of cough, fever, and diarrhea, determine child age and pediatric diseases, and give provision of oralyte solutions.

Cadres help early detection of cases

The cadre is referred to as the spearhead of service in the community and first knows the problems in the community. Early detection is intended to find cases early and prevent occurrence of emergency cases in the community with recommendations not to be late to go to the health center. The addition of cadre capacity is for the examination of general danger signs for infants and toddlers and early recognition of cases of diarrhea, fever and cough can help early detection of cases and immediate referrals, as well as for continuing case prevention competencies and providing information to families that can help prevent delays in handling cases.

Cadres play promote and preventive roles

The cadre gets permission from the health center to provide information to mothers with sick toddlers according to their needs. The information provided is promote and preventive in the event of pain, with the same case or other cases, with activities such as providing advice to sick families, conveying information from the health center to improve public health. Cadres are able to play a role with the support of all competencies.

The Community Health Center provides programs for cadres

The programs provided by health centers for cadres are strived to increase cadre resources and knowledge, optimize cadre coordination with health centers, facilitate collaboration between puskesmas and cadres, and succeed in health center programs through cadre participation. This is very supportive for the achievement of the CB-IMCI program that is planned to be extended to areas that have not been implemented by CB-IMCI with the approval and support of the Health Department, with possible and easy methods to implement. Cadres can easily coordinate with the health center through SMS gateways to deliver and follow up on programs, direct telephone calls when encountering difficult cases for cadres, and regular monthly meetings are held to monitor the program.

Hope to cadres

Health workers hope that the addition of cadre capacity can continue the health center program to be communicated to the community. It is expected that cadres are be able to detect cases early, conduct CB-IMCI services and be able to play a maximum role, especially for areas far from the health center. Competencies possessed by cadres are expected to be able to solve basic problems of mothers with sick toddlers. This hope is pursued by the health center through a commitment to provide education and training to cadres. In fact, training and extension activities get good ratings from cadres.

Cadres feel the benefits of training

Cadres feel the benefits of cadre training organized by the community health center, such as the increased competencies, more confident to provide information to mothers and simple management to sick children who need help. Cadres are also able to detect danger signs for infants and toddlers, determine when children are taken to the health center to check, and able to do simple treatment of sick toddlers. The additional capacity of the cadres is supported by the public's trust in cadres. The role of active cadres is very helpful in increasing the interest and participation of mothers of children under five. This is realized from the creativity and innovation of cadres when organizing integrated service post activities, such as meeting cadre, distribution of balloons, and others. The success of integrated service post is highly dependent on whether or not cadres are active ([Sihombing et al., 2016](#)).

CONCLUSION

The conclusion of this study is 1) the increase of cadre knowledge about cadre capacity differed significantly in the intervention group and the control group, before and after the intervention, 2) there was a difference in the average increase in cadre competency towards the management of CB-IMCI in the intervention group and control group, 3) there is no significant relationship between cadre competence and the achievement of CB-IMCI services, or it can also be said to have a weak relationship. Increased cadre competence does not guarantee more implementation of CB-IMCI, 4) community response and health workers to increase cadre capacity about the management of sick children shows good acceptance, and can be implemented in the local community.

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Declaration of Conflicting Interest

None declared.

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