



Community Health Volunteer Up skilling Increase Community-Based Stunting Early Detection Knowledge

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Abstract

Stunting becomes a public health concern and is still commonly found in the world. The number of new cases of stunting increases every year as it can be caused by poor nutritional status, lack of knowledge, barriers to access to health services, inability to meet nutritional needs. This steady phenomenon can lead to a decrease several quality aspects of future generation. Community-based activities are an alternative solution in stunting management. Health cadres as part of the community and an extension of health workers are expected to be able to carry out early detection and treatment of stunting in toddlers. Capacity building for health cadres is a necessity through regular coaching. This study aims to identify the effect of up-skilling health cadres on knowledge of community-based stunting early detection. The research design used a quasi-experimental type of pre and post-test with a control group. The sample was 33 health cadres for each intervention and control group through purposive sampling technique. The research was conducted in the work area of the Undaan and Dawe Primary Health Centers, Kudus Regency in October-November 2021. The research instrument used was a questionnaire on health cadres' knowledge towards assessment and management of malnutrition in children and a knowledge scale about inpatient management of severely malnourished children with a reliability value of = 0.83. Health cadres receive coaching in four sessions over two days with a duration of 45-60 minutes/session in the form of interactive lectures and demonstrations. Data analysis using Wilcoxon and Mann Whitney test. *Up skilling* of health cadres increased knowledge of community-based early detection of stunting with p-value = 0.001 ($p < 0.05$). Incorporating various methods in training is suggested in improving health cadres' knowledge in finding new cases of stunting in the community while adjointly integrating it with child health service programs in primary health care facilities.

Keywords: Early detection; Health Cadres; Knowledge; Stunting

INTRODUCTION

Stunting is one of the problems of malnutrition in children under five all over the world. The number of stunting under-five cases in the world in 2017 reached 150.8 million (22.2%). The number of stunting under-five cases in Asia was 55% and another 39% of stunting under-fives were in Africa in 2017. Indonesia became the country that contributed the

highest cases of stunting under five in Southeast Asia at 36.4% in 2017. Based on Nutrition Status Monitoring Data, stunting ranks first in nutritional problems in children under five compared to malnutrition, obesity, and underweight in the last three years. The number of stunting under-five cases increased from 27.5% in 2016 to 29.6% in 2017 (Ministry of Health RI, 2018).

Based on the Basic Health Research report, there were 17.6% cases of underweight toddlers, 30.8% cases of stunting toddlers and 9.3% cases of wasting toddlers in 2018. The World Health Organization (WHO) has set a tolerance for the number of stunting under-five cases at 20% whereas Indonesia reported 30% under-five stunting. Based on these data, it can be concluded that the number of stunting cases in Indonesia exceeds the tolerance number set by WHO (Ministry of Health RI, 2018). Central Java Province reported 3.7% cases of malnutrition under five and 13.68% cases of undernourished children. Based on regency health profile data, the prevalence of undernourished toddlers is 5.4% cases, very short toddlers are 31.15% cases, thin toddlers are 2.69% cases, and stunted toddlers are 20.06% cases in 2019 Kudus Regency recorded 3.6% of cases of under-five undernourished, 4.7% of cases of stunted under-five, and 2.9% of under-five cases (Central Java Health Office, 2019). There were 2,871 cases of stunting under five in the Kudus Regency Health Center work area (4.7%) (Kudus Regency Health Office, 2021). The increasing number of cases of undernourished children under five is a health problem that has to be addressed from all levels of society.

The inclining number of stunting cases is caused by poor nutritional status in pregnant women, under-five nutritional status, limited knowledge of mothers about nutrition during pregnancy and after childbirth, limited access to maternal and child health services, inability of the community to meet nutritional needs, and low income (Ministry of Development of Disadvantaged Regions and Transmigration, 2017). Previous research stated that the risk factors for stunting consisted of exclusive breastfeeding, early initiation of breastfeeding, history of low birth weight, expertise, number of family members, inadequate nutritional needs, hand washing

habits, mother's occupation and knowledge, low family income, history of infectious diseases, environment sanitation, height of parents, especially mothers, lack of vitamins C and D (Halim et al., 2021) (Lestari et al., 2018) (Irianti, 2021).

Early detection of stunting can be done by predicting first 1000 days of life. The main predictors of stunting are the height of the father and mother, the mother's weight gain during pregnancy, the sex of the baby, the gestational age at delivery, and the weight and length of the baby at the age of 6 months (Hanieh et al., 2019). Another study stated that the analysis of risk factors for stunting in West Sumatra Province was based on predictors of maternal education level, birth weight, exclusive breastfeeding, children's appetite, and parenting patterns. The results of the study stated that the stunting risk assessment system was quite good in predicting the risk of stunting in West Sumatra Province (Masrul et al., 2020).

The negative impacts from this increasing stunting cases include low intellectual levels of children due to stunted brain development, decreased learning achievement, stunted physical growth, low immunity that is prone of various diseases, especially infectious diseases, and body metabolism disorders (Ministry of Village Development for Disadvantaged Regions and Transmigration, 2017). Various strategies have been carried out to solve stunting such as situational studies, strategic nutrition interventions, consultations, drafting regulations and data management systems, fostering human resource development cadres, case finding and reporting, as well as periodic monitoring-evaluation program (Regulations of Kudus Regency Government, 2021).

The intervention strategy of increasing nutritional intake and reducing infection as an effort to prevent stunting is carried out through the implementation of Tazi's Important Innovations with a target of first 1000 days of life households. The

intervention approach is based on five pillars of stunting management, namely specific nutrition interventions and sensitive nutrition. This strategy can reduce the prevalence of stunting in Tirmiara Village, Central Aceh Regency (Maulida et al., 2021). Another study states that nutritional intake with high-protein animal foods can increase serum protein levels in pregnant women so that they can prevent stunting babies. Protein has important components that can trigger the physical growth of children. Researchers gave *rebon* shrimp or dried shrimp in the form of *koya* powder as much as 100 grams per day for seven days with the assumption of meeting 70 kcal (Abdullah, 2021).

Based on the results of a preliminary study at the Kudus Regency Health Office, several cross-sector programs and policies have been implemented, namely community empowerment in waste management and latrines, supplementary feeding for children and pregnant women, and maternal and child health checks. One indicator of the success of the stunting management program is the increasing number of new cases of stunting in the community. Improving the quality and quantity of health cadres is a necessity to achieve the target of finding new cases actively in the community. Primary Health Care Services must be able to innovate in achieving the success indicators of stunting management programs in each work area. Health cadres are members of the community who are selected, trusted, willing, able, and have the time to identify toddlers suspected of stunting in the community. Knowledge of health cadres about stunting early detection must be increased so that they can carry out the roles, functions, and tasks of community-based stunting management (Notoatmodjo, 2010). It is important for health cadres to understand the basic knowledge about stunting early detection to countermeasure the stunting cases in Indonesia.

The knowledge of stunting among parents and health cadres is needed and can be developed through training to prevent stunting, (Kusumawardani et al., 2020; Sukamto, Hartono, Setyowati, & Mulyani, 2021). Several previous studies explained that health cadres development can increase the capacity of health cadres in handling stunting problems in the community, one of which can increase knowledge, self-efficacy, and skills in preventing stunting in toddlers (Purnamasari et al., 2020). Adistie et al., (2018) explained that the training of health cadres increases knowledge and skills of early detection and stimulation of growth and development in toddlers. Another study stated implementation of the mentoring program for health cadres increased knowledge about stunting (Azizah & Wardhani, 2020). Yuliani (2019) reported that training increased the knowledge of health cadres about early detection of stunting. Increased knowledge and skills of health cadres in conducting early detection of stunting are obtained through the training of health cadres (Haerianti, 2018).

Based on the results of interviews with the person in charge of the Undaan and Dawe Public Health Center nutrition program, so far there has been no training on community-based stunting management. Community-based stunting management consists of early detection, management, monitoring and evaluation. In fact, several villages have budgeted for the financing of stunting handling programs in accordance with the direction of the district government through a zero stunting policy. *Rembug Stunting* is one of the priority programs in the health sector which is budgeted in the village fund. So far, health cadres have only received training on the management of *Posyandu* which is integrated with maternal and child health programs. Training about stunting and its management through lectures, discussion, practice and usage of video proven to be effective in elevating cadres' knowledge (Martha et

al., 2020). However, not many has implemented role-playing as an approach to improve the knowledge related to stunting that is occurs in the community and the needed of case exposure for the health cadres. This is an opportunity in the implementation of up skilling of health cadres in early detection of community-based stunting so that the community can actively participate in finding stunting cases in their respective regions.

Based on this, increasing the knowledge of health cadres about early detection of stunting can be done through continuous training. Nurses collaborate with health cadres in the early detection of stunting in the community. The role of nurses in increasing knowledge of stunting early detection in health cadres shows the consistency and independence of nurses in community-based stunting management efforts. The results of the research are expected to improve science and nursing services. This study aims to identify the effect of up skilling health cadres on knowledge of community-based stunting early detection.

METHOD

The research design used an experimental quasi with the type of pretest and posttest with a control group. This research was conducted in September-November 2021 in the Undaan Primary Health Center Work Area for the intervention group and the Dawe Primary Health Center Work Area for the control group. The number of respondents was 33 health cadres for each intervention and control group through the purposive sampling technique. The inclusion criteria of research respondents were active health cadres, never attended stunting early detection training, age 19-59 years, minimum education level of elementary school, able to read, write, and communicate in Indonesian. The independent variable is the up skilling of health cadres and the dependent variable is the knowledge of community-based early

detection of stunting. The research instruments used were the health care workers knowledge questionnaire towards assessment and management of malnutrition in children (Tafese & Shele, 2015) and the knowledge scale about inpatient management of severely malnourished children (Mogre et al., 2017) with a reliability value = 0.83. This questionnaire identified knowledge about early detection of stunting consisting of 26 statements (23 favorable statements and 3 unfavorable statements) with the answer choices being completely incorrect, incorrect, quite correct, and completely correct.

The intervention given to the intervention group was up skilling of health cadres in four sessions in two days with a duration of 45-60 minutes per session with the following details:

- 1) **Session 1:** health education about the concept of growth and development and stunting in the form of interactive lecture and question-answer session
- 2) **Sessions 2:** health education about stunting and malnutrition early detection in the form of interactive lecture and question-answer session
- 3) **Session 3:** health education about communication, information, and education in the community in the form of interactive lectures and question-answer session
- 4) **Session 4:** demonstration and role play about community-based early detection of stunting and malnutrition

Health cadres filled out the informed consent after reading the research information sheet, then took the pretest before and posttest after the intervention. Researchers compiled modules and educational videos for stunting early detection based on references as supporting media. The control group was only given community-based stunting early detection education modules and videos. This study used univariate and bivariate analysis. In univariate analysis, data are presented in terms of frequency and percentage on the

variables of gender, marital status, education, occupation, income, and previous training experience. The data are presented in the form of mean and standard deviation on the variables of age, length of service as a health cadre, and knowledge of early detection of stunting. Based on the results of the normality test using the Kolmogorov Smirnov test, it was found that the knowledge variable was not normally distributed ($p < 0.05$) so that the data analysis used the Wilcoxon test to test the mean difference between the two groups before and after the intervention. Whether or not there is an intervention effect can be seen from the results of the Mann-Whitney test. This research has passed the ethical test of the Health Research Ethics Commission of the University of Muhammadiyah Kudus No. 60/Z-7/KEPK/UMKU/X/2021.

RESULTS AND DISCUSSION

Table 1 explains that the average age of health cadres in the intervention group is 34.73 years with an SD of 7.509 and the control group is 43.09 years with an SD of 9.409. The average length of time being a health cadre in the intervention group was 5.88 years with an SD of 7.188 and the control group was 9 years with an SD of 9.196.

Table 1. Health cadres' age and length of experience (n=66)

Characteristics	Intervention		Control	
	Mean	SD	Mean	SD
Age	34.73	7.509	43.09	9.409
Length of experiences as a health cadres	5.88	7.188	9	9.196

Table 2 shows all cadres in the intervention and control groups were female (100%). Most of the married health cadres in the intervention group were 32 people (97%) and the control group was 29 people (87.9%). Half of the health cadres had a high school education level/equivalent in the intervention group as

many as 18 people (54.5%) and the control group as many as 19 people (57.6%). Most of the health cadres worked as housewives in the intervention group as many as 29 people (87.9%) and 18 people in the control group (54.5%). Most of the health cadres did not have a job in the intervention group as many as 27 people (81.8%) and the control group as many as 24 people (72.7%). Half of the health cadres or as many as 18 people (54.5) had attended training in the intervention group and most of the health cadres or as many as 28 people (84.8%) had attended the training.

Table 2. Health cadres' socio demographic characteristics (n=66)

Characteristics	Intervention		Control	
	f	%	f	%
Gender				
Female	33	100	33	100
Marital status				
Not/unmarried	0	0	1	3
Married	32	97	29	87.9
Widow/widower	1	3	3	9.1
Education level				
Elementary school	5	15.2	6	18.2
Junior high school	10	30.3	6	18.2
Senior high school	18	54.5	19	57.6
College	0	0	2	6.1
Occupation				
Not working	1	3	4	12.1
Housewife	29	87.9	18	54.5
Private employee	0	0	3	9.1
Entrepreneur	0	0	4	12.1
Trader	3	9.1	0	0
Teacher/lecturer	0	0	1	3
Others	0	0	3	9.1
Income				
Do not have	27	81.8	24	72.7
< IDR 2,290,995,-*	4	12.1	6	18.2
≥ IDR 2,290,995,- *	2	6.1	3	9.1
Training Experience				
Yes	18	54.5	28	84.8
No	15	45.5	5	15.2
Total	33	100	33	100

*Minimum Region Wage Kudus Regency in 2021

Table 3 describes the average knowledge of health cadres about community-based early detection of stunting before the intervention of 73.33 with SD of 10,466 and after the intervention of 82.79 with SD of

6,556 in the intervention group. The average knowledge of health cadres about community-based early detection of stunting before intervention was 74.91 with SD 7,059 and after the intervention was 77.18 with SD 5,259 in the control group.

Table 4 states that there is a statistically significant difference in the knowledge of health cadres about community-based early detection of stunting before and after the intervention in both the

intervention group with $p = 0.000$ ($p < 0.05$). However, there was no statistically significant difference in the knowledge of health cadres about community-based early detection of stunting in the control group with $p = 0.065$ ($p > 0.05$). Table 5 explains that there is a statistically significant effect of up skilling health cadres on knowledge about community-based early detection of stunting with $p\text{-value} = 0.001$ ($p < 0.05$).

Table 3. Health cadres' knowledge about early detection of community-based stunting in the intervention and control groups before and after the intervention (n=66)

Variables	Intervention			Control		
	Mean	SD	95% CI	Mean	SD	95% CI
Knowledge						
Before	73.33	10.466	69.62-77.04	74.91	7.059	72.41-77.41
After	82.79	6.556	80.46-85.11	77.18	5.259	75.32-79.05

Table 4. Differences in health cadres' knowledge about community-based early detection stunting in the intervention and control groups before and after intervention (n=66)

variable	Mean	SD	MD	p-value
Knowledge				
Intervention				
Before	73.33	10.466	9.46	0.000
After	82.79	6.556		
Control				
Before	74.91	7.059	2.27	0.065
After	77.18	5.259		

Table 5. Effect up skilling health workers to the knowledge of community-based early detection stunting (n=66)

Variable	Mean	SD	p-value
Knowledge			
Intervention	82.79	6.556	0.001
Control	77.18	5.259	
Difference	5.606		

The problem of stunting in toddlers needs attention. Health workers as health service providers need to pay attention to several factors that can reduce the prevalence of stunting in the community. Based on previous research, it is stated that the factors that influence the reduction in the prevalence of stunting are prevention of low birth weight in infants, improved parenting for boys, prevention of pregnancy at a young age, stunting in adolescent girls, completeness of immunizations, providing health education to mothers and children. *Posyandu* for toddlers, and increasing iron consumption in pregnant women. Health cadres in collaboration with health workers can provide health education to pregnant women with low height and pregnancy at a young age as a high risk as well as management of care for babies with low birth weight to prevent stunting. (Simbolon et al., 2019).

Around health workers, including in the older age groups. The results of this study are by (Adistie et al., 2017); (Handayani et al., 2019); (Martha et al., 2020); (Purnamasari et al., 2020); (Arsy, 2021) which states that all health cadres are included in the adult age group. Age affects the formation of the mindset of health cadres. As age increases, the knowledge of health cadres also develops. Health cadres who are more mature will find it easier to gain trust from the community because they have a longer life experience than the younger age groups.

Most of the health cadres have a high school education background. The results of this study are supported by previous studies (Adistie et al., 2018; Handayani et al., 2019; Martha et al., 2020; Purnamasari et al., 2020; Arsy, 2021), that explained the majority of health cadres have a high school education background. The educational background of health cadres affects their ability to receive and internalize all learning information provided by health workers. Health cadres who have a higher educational

background are considered to be more capable of carrying out their roles and functions in the early detection of stunting in their respective regions. Health cadres with low educational backgrounds will find it more difficult to receive information and directions from health workers about community-based stunting early detection, so they do not believe in the importance of stunting early detection in the community.

The data shows that the majority of health cadres play or work as housewives. The results of this study are in accordance with several researches (Handayani et al., 2019; Purnamasari et al., 2020; Arsy, 2021). Health cadres are better able to manage their time between taking care of their family and society because the type of work they do is more flexible and dynamic. So that health cadres have more time to actively participate in solving health problems in the community. The average health cadre has more than five years of experience as a health cadre. This is following (Adistie et al., 2017); (Handayani et al., 2019); (Purnamasari et al., 2020); (Arsy, 2021), stated that health cadres have five to ten years of experience as health cadres. The desire to become a health cadre does not apply to all levels of society so that it affects the length of time being a health cadre. The regeneration process for health cadres is also a necessity so that the regeneration process for health cadres can run well. The longer a health cadre is, the better the understanding of the tasks that must be done and the better participation in activities.

Half of the health cadres have never received training on community-based stunting early detection. (Adistie et al., 2017) stated that health cadres who have never received training will tend to have less knowledge. The process of up skilling of health cadres is expected to increase the understanding of health cadres about early stunting detection, especially the active discovery of stunting cases in the community.

Some of the characteristics of these health cadres directly affect their understanding of community-based stunting early detection.

Research to identify factors that influence the knowledge and motivation of health cadres in preventing stunting in children under five was carried out in eight districts/cities in West Java Province, namely Karawang, Tasikmalaya, Garut, Bandung, Subang, Sukabumi, Cianjur, and West Bandung. The results of the study stated that the majority of health cadres had good knowledge about stunting prevention by 81.27% influenced by education level and marital status. Half of the health cadres have good motivation about stunting prevention by 47.66% influenced by education level, marital status, and age. Based on this, it is necessary to increase the role and function of health cadres in the prevention and early detection of stunting by providing continuous guidance, stunting prevention training, and awarding awards (Suzana Mediani et al., 2021).

The results of the intervention up skilling of health cadres in two sessions in two days statistically showed a significant difference in the knowledge of health cadres about community-based early detection of stunting before and after the intervention in the intervention group with $p = 0.000$ ($p < 0.05$). This finding strengthens the results of research on *Posyandu* cadre training that can increase knowledge, self-efficacy, and skills in preventing stunting in toddlers (Purnamasari et al., 2020; Hariani et al., 2019). The intervention sessions given in this study were by conducting health education about stunting early detection, trigger case-based stunting assessment through demonstrations and role play, and community-based stunting early detection simulations at *posyandu*. So this answers the role of health education interventions, demonstrations, and role plays, as well as simulations in increasing cadre knowledge. Similar research on assisting *posyandu*

cadres in detecting child growth and development has proven to be able to increase knowledge about stunting among health cadres in Ringinpitu Village, Plemahan District, Kediri Regency (Azizah & Wardhani, 2020). Similar findings are also found in efforts to assist health cadres and their impact on increasing knowledge in Betteng Village, Pamboang District, Majene Regency (Haerianti, 2018).

This study also found that there was no significant difference in knowledge of health cadres about community-based early detection of stunting before and after intervention in the control group with $p = 0.063$ ($p > 0.05$). This can be answered by the difference in the provision of interventions up skilling between the control and intervention groups. The control group only received information about stunting management in the form of modules and educational videos. Even though this finding is slightly different with the research from Martha et al. (2020) about the usage of film screening as one of the methods to improve cadres' knowledge about stunting early detection, this study further strengthens the role of varying intervention types and media in health education in the community. This variation methods of training encompassing group discussion, role plays, games, and seminars had been proven to be effective in alleviating cadres' knowledge related to stunting early detection (Rahmawati & Sartika, 2020). Research conducted in Shiraz, Iran showed the effectiveness of role-playing compared to lecture sessions in increasing the knowledge of health cadres regarding the Breastfeeding Promotion Program (Vizeshfar et al., 2019). A specific media plays a great role in affecting specific domain of individual's behavior. The provision of booklet and educational video in the control group did not prove a significant improvement on health cadres' knowledge but proven to be able to mediated cadres' skill in early stunting detection of stunting (Sartika & Purnanti, 2021).

Table 5 explains that there is a statistically significant effect of up skilling health cadres on knowledge of health cadres about community-based early detection of stunting with $p = 0.000$ ($p < 0.05$). These results strengthen research on cadre empowerment through a series of stunting detection and prevention training in the Bogor Regency area (Martha et al., 2020). The potential for increasing cadre knowledge through this knowledge is also similar to the training carried out in Luwigoong Village, Luwigoong District, Garut Regency through the use of the Stunting-Based Child (ABS) application (Handayani et al., 2019). Other studies have also shown an increase in knowledge of health cadres related to stunting prevention and management after training and empowerment of health cadres including the variation of training methods such as lecture, discussion, brainstorming combined with the usage of modules and demonstration (Wijayanti & Sariyani, 2020; Tampake et al., 2021). Further elaboration of training delivery methods also can be done through the audiovisual demonstration as it promotes the cadres' skill as it had been implemented to teach massage therapy to improve children's nutritional status (Fazrin, Anggraeni & Saputro, 2021). Thus, training and knowledge-sharing through a variety of learning/training methods obtained by health cadres during training are important to maintain the role of health cadres in the community. This is in line with research that shows the importance of the role of knowledge-sharing in shaping the motivation of health cadres (Singh et al., 2016).

Empowerment of families in handling stunting in the community is a necessity. Mothers as parents play an important role in reducing the prevalence of stunting through good parenting. Knowledge of food, personal hygiene, education and the role of local institutions is a determining factor for the success of stunting management in the community. Utilization of

the potential of local food and its processing can be a solution to the problem of family poverty to meet adequate nutritional needs. Utilization of local information media can be integrated in efforts to strengthen stunting management and promotion in the community (Muksin et al., 2022).

This phenomenon also occurs in Asmat Regency. Based on the results of interviews, it was found that the high incidence of stunting was due to people's habits of buying less nutritious food ingredients from gardening and catches such as vegetables, corn, and fish. Mothers do not wash their hands because they do not have clean water when preparing food, causing diarrhea in children. The community is not motivated to use *posyandu* and health education. People come to health care facilities when the child's condition has deteriorated. There needs to be interesting health education, providing financial assistance and healthy food on a regular basis so that stunting can be prevented (Sianipar et al., 2021). Previous research has developed ring card health media using attractive colors and images so that the material is easier to understand by the family or mother. The results showed that the use of ring card media proved to be effective in increasing the knowledge, attitudes, and skills of mothers or families in preventing stunting in toddlers (Cahyati & Lestari, 2021).

The community as the front line in the handling of stunting must be able to synergize with local stakeholders and innovate through several activities. Several innovation activities that have been implemented in Ara Village, Kembang Tanjong District, Pidie Regency, namely the use of a nutrition house as a center for community empowerment activities, establishing relationships with stakeholders, collecting funds from the government and the community for the implementation of activities, developing human resource capacity. The failure of

stunting management in the community is influenced by limited knowledge, low human resources, lack of support from stakeholders, wrong perceptions of clean and healthy living behavior, and poor environmental sanitation. Community empowerment-based innovation activities need to be initiated so that they provide effective results in reducing stunting prevalence in the community (Oktarina et al., 2022).

Another innovation activity was developed by the Giriwoyo I Public Health Center, Wonogiri Regency through increasing food availability and knowledge of good maternal nutrition during pregnancy and childbirth. This activity consists of program socialization to the community as well as monitoring and evaluation. The output of this activity is a decrease in the percentage of pregnant women with chronic energy deficiency, a decrease in the percentage of babies with low birth weight, an increase in the percentage of pregnancy care participation in pregnant women, an increase in the percentage of mothers with toddlers attending the *posyandu* or public health center. This program increases public awareness and understanding of the importance of stunting prevention and handling, which is the responsibility of all community components and stakeholders (Suranny & Maharani, 2021).

It is necessary to identify barriers to community-based stunting management. The results of previous studies found that the roles and functions of health cadres in Malutu Village were not optimal due to the limited time available, lack of guidance or training provided, lack of public awareness about the impact of stunting. The solutions offered are providing financial support for stunting handling in the community, increasing the capacity of health cadres, establishing relationships and synergizing with local stakeholders so that it is hoped that the stunting problem can be handled optimally (Hamdie et al., 2020).

The government has provided funds for village development in various fields including health through village funds. The community synergizes with the village government to utilize village funds in handling stunting in the village. Stunting is one of the priority issues because it is related to the preparation of quality human resources in the future to develop villages. Health cadres advocate to the village government by providing an understanding of the impact of stunting so that the village government has confidence that the stunting problem is a priority problem that must be resolved immediately by utilizing village funds. An advanced village is a village that has quality human resources (Indra & Khoirunurrofik, 2022).

CONCLUSION

The results of this study can be concluded that there is a statistically significant difference in knowledge about community-based early detection of stunting before and after the intervention in the intervention group. Up skilling of health cadres increases knowledge about community-based early detection of stunting.

Interventions for Up skilling health cadres can be integrated with the implementation of programs or activities for maternal and child health services at *posyandu*. Health cadres as part of the community and extension of health workers participate actively in handling stunting problems in their respective regions. Knowledge of health cadres about early detection of stunting is the basis or capital in increasing the number of new cases of stunting in the community. Early detection of stunting in toddlers can improve the management or good handling of stunting to prevent unexpected complications.

Further research can identify the effect of up skilling health cadres on other variables such as perceptions, readiness, attitudes, skills, self-efficacy, or community-based stunting early detection behavior.

Further research can also identify other innovative community-based interventions that can increase knowledge of stunting early detection in health cadres according to the needs of the community. The development of health education media is a necessity as a supporter in the community-based intervention process.

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REFERENCES

- Abdullah, V. I. (2021). The Effect Of Koya Reboned Powder Consumption On Protein Levels Of Pregnant Women In Prevention Of Stunting In Babies Vera. *Jurnal Kesehatan Prima*, 15(August), 109–115.
- Adistie, F., Lumbantobing, VBM, & Maryam, NNA (2018). Empowerment of Health Cadres in Early Detection of Stunting and Stimulation of Growth and Development in Toddlers. *Media Karya Kesehatan*, 1(2), 173–184. <https://doi.org/10.24198/mkk.v1i2.18863>
- Adistie, F., Maryam, NNA, & Lumbantobing, VBM (2017). Knowledge of Health Cadres About Early Detection of Malnutrition in Toddlers. *Journal of Science and Technology Applications for Society*, 6(3), 173–177. <http://jurnal.unpad.ac.id/dharmakarya/article/view/10319/7705>
- Arsy, GR (2021). Description of Knowledge and Attitudes of Posyandu cadres in Monitoring the Growth of Under-fives Development in the Rejosari Health Center, Kudus Regency. *Nursing Profession*, 8(1), 70–81. <http://jurnal.akperkridahusada.ac.id/index.php/jpk/article/view/94>
- Azizah, EN, & Wardhani, RK (2020). Movement of Posyandu Cadres Aware of Stunting in Ringinpitu Village, Plemahan District. *Journal of Community Engagement in Health*, 3(2), 229–232. <https://doi.org/10.30994/jceh.v3i2.70>
- Cahyati, N., & Lestari, M. D. (2021). Effectiveness of Ring Card as a Promotive Effort For Mothers Under Two Years in Stunting Prevention. *Jurnal Kesehatan Prima*, 15(1), 46–56.
- Central Java Health Office. (2019). Health Profile of Central Java Province 2019. In *Central Java Health Office*.
- Fazrin, I., Anggraeni, S., Saputro, H. Audiovisual demonstration methods on the knowledge and behavior of cadres about stimulation o massage therapy in improving nutrition status in children. *STRADA Jurnal Ilmiah Kesehatan*, 10(2). <https://doi.org/10.30994/sjik.v10i2.843>
- Halim, F., Ermiami, & Sari, E. A. (2021). Factors of stunting in toddlers: A literature review. *Journal of Nursing Care*, 4(1), 285–294.
- Hamdie, N. A., Sompaa, A. T., & Anshar Nur, M. (2020). Community Empowerment Strategy in Handling Efforts of Stunting in Malutu Village, Hulu Sungai Selatan. *Saudi Journal of Economics and Finance*, 4(9), 446–452. <https://doi.org/10.36348/sjef.2020.v04i09.004>
- Handayani, TP, Tarawan, VM, & Nurihsan, J. (2019). Increased Knowledge and Attitudes of Cadres About Stunting in Toddlers Age 12-36 Months Through the Application of Stunting-Free Child Applications (Abs). *Malahayati Journal of Midwifery*, 5(4), 357–363. <https://doi.org/10.33024/jkm.v5i4.22058>
- Hanieh, S., Braat, S., Simpson, J. A., Ha, T. T. T., Tran, T. D., Tuan, T., Fisher, J., & Biggs, B. A. (2019). The Stunting Tool for Early Prevention: Development and external validation of a novel tool to predict risk of stunting in children at 3 years of age. *BMJ Global Health*, 4(6), 1–12. <https://doi.org/10.1136/bmjgh-2019-001801>
- Hariani, Sastriani, & Yuliani, E. (2019). *Improving Knowledge of Posyandu Cadres about Early Detection of Stunting Through Training*. 27–33.
- Indra, J., & Khoirunurrofik, K. (2022). Understanding the role of village fund and administrative capacity in stunting reduction: Empirical evidence from Indonesia. *PLoS ONE*, 17(1 January), 1–12.

<https://doi.org/10.1371/journal.pone.0262743>

- Irianti, E. (2021). *Health Notions*, Volume 5 Number 12 (December 2021) Risk Factors of Stunting in Children Under Five Years Old 443 | Publisher : Humanistic Network for Science and Technology *Health Notions*, Volume 5 Number 12 (December 2021) ISSN 2580-4936 444 | Publisher : Humanistic Network for Science and Technology. 5(12), 443–448.
- Kusumawardani, L.H., Rasdiyanah, R., Rachmawati, R., Jauhar, M., Rohana, IGAP. (2020). Community-based stunting intervention strategies: Literature review. *Dunia Keperawatan: Jurnal Keperawatan dan Kesehatan*, 8(2), 159-268.
- Lestari, E. D., Hasanah, F., & Nugroho, N. A. (2018). Correlation between non-exclusive breastfeeding and low birth weight to stunting in children. *Paediatrica Indonesiana*, 58(3), 123–127. <https://doi.org/10.14238/pi58.3.2018.123-7>
- Martha, E., Nadira, NA, Sudiarti, T., Mayangsari, AP, Enjaini, EF, Ryanthi, TP, Bangun, DE, Indonesia, U., Indonesia, KU, & Depok, K. (2020). *THE EMPOWERMENT OF CADRES AND MEDICASTERS IN THE EARLY Stunting is often not considered a serious problem. Children will be considered stunted when they have height- for age more than two standard deviations below the standard median of the WHO Child Gro. August*, 153–161. <https://doi.org/10.20473/ijph.v11i5l.2020.153-161>
- Masrul, Usman, E., Yanis, A., & Nindrea, R. D. (2020). Scoring System in Prediction of Stunting Risk among Children in West Sumatera Province, Indonesia. *Systematic Reviews in Pharmacy*, 11(9), 636–641. <https://doi.org/10.31838/srp.2020.9.94>
- Maulida, M., Nadapdap, T. P., & Nasution, Z. (2021). Analysis of the Successful Implementation of Tazi's Important Innovations in Tackling Stunting in the Work Area of the Rusip Antara Public Health Center. *International Journal Papier Public Review*, 2(4), 114–127. <https://doi.org/10.47667/ijppr.v2i4.129>
- Masyita Haerianti, NEYIJI (2018). Health Cadre Training About Early Detection Of Stunting Toddler In Betteng Village. *Journal of Public Health*, 01, 41–46.
- Ministry of Village Development of Disadvantaged Regions and Transmigration. (2017). Village pocketbook on stunting management. In *Pocket Book of Villages in Handling Stunting*.
- Mogre, V., Yakubu, A., Fuseini, M., Amalba, A., & Aguree, S. (2017). Nurses' knowledge and attitudes regarding malnutrition in children and its management in Ghana. *Curationis*, 40(1), 1–8. <https://doi.org/10.4102/curationis.v40i1.1618>
- Muksin, M., Perwiraningrum, D. A., Amareta, D. I., & Purwoko, D. (2022). The Main Activities of Community-Based Maternal Empowerment for Stunting Recovery. *Proceedings of the 2nd International Conference on Social Science, Humanity and Public Health (ICOSHIP 2021)*, 645(Icoship 2021), 291–295. <https://doi.org/10.2991/assehr.k.220207.051>
- Notoatmodjo, S. (2010). *Behavioral Health Sciences*. Rineka Cipta.
- Oktarina, S., Saiban, K., & Wahyudi, C. (2022). Innovation for Handling Stunting Based on Community Empowerment in Gampong Ara, Kembang Tanjong Sub-District, Pidie District, Aceh Province of Indonesia (Study of Policy Implementation Based on Pidie Regent Regulation Number 77 of 2017 about Reduction in Stunting). *International Journal of Research in Social Science and Humanities*, 03(03), 12–24. <https://doi.org/10.47505/ijrss.2022.v3.3.2>
- Purnamasari, H., Shaluhiah, Z., Kusumawati, A., Faculty, M., Society, K., Diponegoro, U., Lecturer, S., Bachelor, P., Health, I., & University, M. (2020). Posyandu Cadre Training as an Effort to Prevent Stunting in Toddlers in the Working Area of Margadana Health Center and South Tegal Health Center, Tegal City. *Journal of Public Health (e-Journal)*, 8(3), 432–439.
- Rahmawati, ND, & Dewi Sartika, RA (2020). Cadres' role in Posyandu revitalization as stunting early detection in Babakan Madang Sub-District, Bogor District. *ASEAN Journal of Community Engagement*, 4(2), 485–499. <https://doi.org/10.7454/ajce.v4i2.1055>
- Regent Regulations of Kudus (2021). *Kudus District Health Profile 2020*.
- RI, K. (2018). *Guidelines for Behavior Change Communication Strategies in Accelerating Stunting Prevention in Indonesia*. <https://promkes.kemkes.go.id/download/dsfs/file>

- Sartika, Q.L., Purnanti, K.D. (2021). Perbedaan media edukasi (booklet dan video) terhadap ketrampilan kader dalam deteksi dini stunting. *Jurnal Sains Kebidanan*, 3(1). <https://doi.org/10.31983/jsk.v3i1.6907>
- Sianipar, T. M. E., Nurhasana, R., Hanita, M., & Ayuningtyas, D. (2021). Improving Human Resources as Local Food Processors to Accelerate Stunting Prevention to realize the SDGs: Case Study in Asmat, Papua. *IOP Conference Series: Earth and Environmental Science*, 940(1). <https://doi.org/10.1088/1755-1315/940/1/012095>
- Simbolon, D., Suryani, D., & Yorita, E. (2019). Prediction Model and Scoring System in Prevention and Control of Stunting Problems in Under Five-Year-Olds in Indonesia. *Jurnal Kesehatan Masyarakat*, 15(2), 160–170. <https://doi.org/10.15294/kemas.v15i2.13415>
- Singh, D., Cumming, R., Mohajer, N., & Negin, J. (2016). The motivation of Community Health Volunteers in rural Uganda: the interconnectedness of knowledge, relationship, and action. *Public Health*, 136, 166–171. <https://doi.org/10.1016/j.puhe.2016.01.010>
- Sukamto, I.S., Hartono, H., Styowati, R., Mulyani, S. (2021). Community health center worker perspectives on stunting risk factors and challenge of stunting prevention program: A qualitative study. *Teikyo Medical Journal*, 44(05), 1769-1779.
- Suranny, L. E., & Maharani, F. C. (2021). Mapping of Community Empowerment in Prevention Stunting in Kabupaten Wonogiri through “sego Sak Ceting.” *IOP Conference Series: Earth and Environmental Science*, 887(1). <https://doi.org/10.1088/1755-1315/887/1/012035>
- Suzana Mediani, H., Hendrawati, S., Pahria, T., Mediawati, A. S., & Suryani, M. (2021). Factors Affecting the Knowledge and Motivation of Health Cadres on Stunting Prevention in Children in Indonesia. *Preprints, December*, 1–18. <https://doi.org/10.20944/preprints202112.0312.v1>
- Tafese, Z., & Shele, A. (2015). Knowledge, attitude, and practice towards malnutrition among health care workers in Hawassa City, Southern Ethiopia. *Global Academic Research Journals*, 1(1), 1–8.
- Tampake, R., Arianty, R., Mangundap, SA, Emy, B., & Sasmita, H. (2021). The effectiveness of training on improving the ability of health cadres in early detection of stunting in toddlers. *Open Access Macedonian Journal of Medical Sciences*, 9(E), 373–377. <https://doi.org/10.3889/oamjms.2021.6067>
- Vizeshfar, F., Zare, M., & Keshtkaran, Z. (2019). Role-play versus lecture methods in community health volunteers. *Nurse Education Today*, 79(October 2018), 175–179. <https://doi.org/10.1016/j.nedt.2019.05.028>
- Wijayanti, IT, & Sariyani, D. (2020). Training and Empowerment of Health Cadres in the Prevention and Management of Stunting in Children. *Journal of Community Care*, 2(2), 49–58. <https://doi.org/10.37287/jpm.v2i2.92>
- Yuliani, E. (2019). *Improving Knowledge of Posyandu Cadres about Early Detection of Stunting Through Training*. 27–33.