

Increasing knowledge and awareness of health workers and health cadres regarding congenital rubella syndrome in Imogiri II Bantul Primary Health Centre



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ABSTRACT

Introduction: Prevention through campaign activities, Measles-Rubella (MR) vaccine introduction, and education play an essential role in controlling rubella and, eventually, Congenital Rubella Syndrome. A Community Engagement program was arranged collaboratively to improve the quality of promotive, preventive education by health workers and cadres and to improve the advanced management of Congenital Rubella Syndrome for health workers.

Methods: A multi-method engagement program was conducted in collaboration with Imogiri II Bantul Primary Health Centre from March to October 2023. The program aimed to implement various activities involving health workers and health cadres. A descriptive study using the survey method was conducted to assess the knowledge level about Congenital Rubella Syndrome among health workers and cadres before and after the program. The survey included multiple-choice yes-no questions, and the results were analyzed using the McNemar test for paired nominal data with SPSS version 27.

Results: We included 25 health workers and 28 health cadres. The results showed a significant increase in health worker's knowledge regarding the impact of Congenital Rubella Syndrome on various organs, including the brain, eyes, ears, heart, and child growth and development (p -values: 0.004, 0.004, 0.0004, 0.021, and 0.008, respectively). There was a notable improvement in health cadres' knowledge concerning the impact of CRS on the brain, eyes, ears, heart, child growth and development, and the child's quality of life (p -values: 0.007, 0.000, 0.000, 0.001, and 0.000, respectively).

Conclusion: The community engagement program helps to enhance the knowledge of health workers and cadres concerning the impact of Congenital Rubella Syndrome on patients.

Keywords: congenital rubella syndrome; awareness; health workers; cadres; Indonesia.

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INTRODUCTION

Rubella infection is caused by a viral infection in children and young adults. In general, symptoms of rubella infection include mild symptoms such as fever, reddish rash, lymphadenopathy, sore throat, red eyes, headache, and anorexia.¹ The rash will appear starting from the face and spread throughout the body within 24 hours and for the last three days.² About 20-50% of people infected with the virus are asymptomatic and therefore undiagnosed.^{2,3} Rubella infection can cause abortion, stillbirth, and congenital malformations in children if the infection occurs in pregnancy, especially in the

early trimester of pregnancy.⁴ However, infection during pregnancy often goes undetected because it often occurs without a rash.⁵ Congenital malformations that occur in children are called Congenital Rubella Syndrome (CRS), which is associated with symptoms of hearing loss, impairment of vision (especially congenital cataracts), congenital heart disease, central nervous system abnormalities, and global developmental disorders.⁶ The most common symptom of a single disorder is hearing loss.³ It is estimated that around 46% of CRS cases reported globally come from Southeast Asian countries, especially countries that have not implemented

rubella vaccination campaigns.⁷

Rubella virus infection is transmitted through direct contact or inhalation of nasopharyngeal secretion droplets. The virus will replicate in the mucosa of the respiratory tract and cervical lymphatic nodes. In the next stage, the virus will travel to the target organ through the systemic circulation. The infectious phase occurs about eight days before to eight days after rash onset.⁸ Pregnant women infected with rubella have a 90% chance of transmitting the virus to the baby.⁹ Infants with CRS are infectious and can excrete rubella virus through urine and nasopharyngeal secretions until 27 months. Prevention of

rubella transmission is essential, especially for pregnant women who do not have immunity obtained through vaccines or previous rubella virus infection.^{3,8,9}

Rubella is a vaccine-preventable disease.^{3,10} The current rubella immunizations available in Indonesia are the MR (Measles Rubella) and MMR (Measles, Mumps, and Rubella) vaccines, with the vaccine virus type being a live attenuated virus. There is no inactivated vaccine, so the rubella vaccine cannot be given to pregnant women.³ Rubella vaccine campaigns began in 2015 in the United States. By 2018, 168 out of 194 countries had implemented rubella vaccination campaigns, covering around 69% of the population. After rubella vaccination, rubella cases decreased by 97% from 2000 to 2018.⁹ The MR vaccine campaign in Indonesia began in 2017 gradually in 2 phases, namely: phase 1 in August-September 2017 throughout Java, and phase 2 in August-September 2018 throughout Sumatra, Kalimantan, Sulawesi, Bali, Nusa Tenggara, Maluku, and Papua.¹¹ The coverage rate of the phase I MR campaign was 100.98%, and phase II was 72.79%, resulting in national coverage of 87.33%. This simultaneous immunization significantly impacted the reduction of confirmed rubella cases by 85% in 6 provinces on the island of Java.³ In a retrospective study conducted at Dr. Sardjito Hospital Yogyakarta, the incidence of CRS from July 2008 to June 2013 was 0.05-0.25/1000 live births.¹² Then, after MR vaccination in 2017, the incidence of CRS decreased to 0.08/1000 live births.¹³

In 2022, community engagement for children with CRS with the title "Improving the Quality of Life of Children with Congenital Rubella Syndrome" was carried out collaboratively by the Department of Child Health, Department of Ophthalmology, Department of Ear, Nose, and Throat (ENT) Department of Ear, Nose, and Throat (ENT) Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, Dr. Sardjito Hospital. This activity formed a community for parents of CRS children, namely the "Peduli Anak CRS" community consisting of 28 members. Ten children live in the Special Region of the Yogyakarta

area, and most live in the Bantul Regency (60%). Community service conducted in 2022 found that children with CRS had a low quality of life. Prevention through campaign activities, MR vaccine introduction, and education play an essential role in controlling rubella disease to protect children from severe disease and disability that can affect the quality of life. Based on the previous year's community service results, our proposed community service effort is expected to improve promotive and preventive efforts for CRS infection. We chose Bantul Regency according to the domicile of most of the CRS Child Care community, with the Imogiri II Bantul Primary Health Center (PHC) as the domicile area of one of the members of the community we chose for the implementation of community service in 2023.

METHODS

The Community Engagement Program was held from March to October 2023. The team of this program consists of specialists from the Department of Child Health, Department of Ophthalmology, Department of Ear, Nose, and Throat (ENT) Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, Dr. Sardjito Hospital. The objectives of this Community Engagement Programme in 2023 include improving the quality of promotive, preventive education, and advanced management of CRS by health workers and aiming to improve the quality of promotive and preventive education of CRS by health cadres. We collaborate with Imogiri II Bantul Primary Health Centre to implement this activity with health workers and health cadres as participants. Activities specifically carried out to achieve the objectives of this Community Service are making CRS and TORCH pocketbooks for health workers and health cadres, making CRS education banners, CRS and TORCH (acronym of Toxoplasmosis, Others e.g. syphilis; hepatitis B, Rubella, Cytomegalovirus, Herpes simplex) education seminars for health workers, and congenital disease education seminars and growth and development detection for health cadres.

The first meeting was an educational seminar for health workers. The activity

was opened with the catch-up of MR2 immunization for toddlers at Imogiri II Bantul PHC. Then, the activity continued with the distribution of CRS and TORCH pocketbooks, the display of CRS educational banners, and the CRS and TORCH material seminars by a pediatric neurologist. The second meeting was an education and socialization seminar for health cadres at Imogiri II Bantul PHC. Neurologic pediatricians presented about infant screening material with suspicion of congenital infection. Moreover, an ophthalmologist presented infant screening material with suspicion of congenital eye abnormalities. Then, the otolaryngologist presented infant screening material with suspicion of congenital ear abnormalities. Furthermore, the lecture session is closed by the presentation of growth and development detection material by a general practitioner of Imogiri II Bantul PHC. The pocketbook was prepared as a guide and provision for health workers and health cadres in education and early detection of CRS and TORCH in the community. The CRS banner is an educational media to support information and increase awareness about CRS.

A descriptive study using the survey method was conducted in this activity to observe the level of knowledge about CRS from health workers and health cadres before and after the community engagement program. The survey consisted of multiple-choice yes-no questions concerning the following topics: the cause of CRS, the transmission of the disease, the organ systems that were affected, the supporting examinations needed, and multidiscipline management. As the pre-test, the survey was distributed in the first and second seminars before the expert presentation to provide an overview of health worker's and health cadres' knowledge about CRS. The procedures and protocols of this study were approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Public Health and Nursing, Universitas Gadjah Mada, with KE/FK/0874/EC/2023. Data were processed and analyzed using SPSS version 27 (IBM Corp, Armonk, NY, USA). The pre-test and post-test results were analyzed using the McNemar test for paired nominal data.

RESULTS

In this program, we conducted a seminar that included socialization and education about CRS for health workers and health cadres as participants. We compared the participants' knowledge levels before and after the seminar to assess and evaluate the program's efficacy. In the first seminar, 29 health workers participated. Of the total participants, 4 subjects were excluded because they did not complete the survey (characteristics of the health workers described in Table 1). In the second seminar, 38 health cadre participants attended, out of which 10 participants were excluded because they still needed to complete the survey data. The study's response rate for health workers and healthcare data was 86.2% and 73.6%, respectively.

Table 2 presents the results of the pre-test and post-test analyses of the health workers, while Table 3 presents the results of the health cadres' analysis. The results were analyzed with the McNemar test for paired nominal data. Question 1 related to the participants' prior knowledge of CRS prevention. Questions 2-6 reflected the participants' general knowledge of the impact of CRS on various organs and the growth and development of the child. Questions 7-11 reflected the participant's knowledge of the ability to care for and seek treatment for a child with CRS. Question 12 reflects participants' knowledge of the impact of CRS on quality of life.

The results of the pre-test and post-test analysis in Table 2 show that there are statistically significant results on questions number 7, 8, 9,10,11 regarding participants' knowledge of the impact of CRS on various organs, namely the brain, eyes, ears, heart, and child growth and development (p-values: 0.004, 0.004, 0.004, 0.021, and 0.008 respectively). Questions on prevention of CRS, complications of CRS on various organs, impact of CRS on child development, and impact of CRS on child quality of life were not statistically significant. Most participants had answered these questions with the correct answer (yes) in the pre-test.

There are statistically significant results on questions number 7, 8, 9,10,11, and 12 (Table 3). The questions describe participants' knowledge of the impact

Table 1. Health Worker's Characteristic

Characteristic	Value (n=25)	
Age (years)	38,56 ± 8,70	
Gender		
Female	22	88%
Male	3	12%
Occupation		
Nurse	7	28%
Midwife	4	16%
Medical Administrator	4	16%
Nutritionist	3	12%
Health Promotor	2	8%
Sanitarian	2	4%
Pharmacist	1	4%
Pharmacist assistant	1	4%
Medical doctor	1	4%
Dentist	1	4%
Medical records	1	4%
Education		
Diploma (D III)	13	52%
Bachelors (S 1)	9	36%
Medical doctor	1	4%
Dentist	1	4%

of CRS on various organs, namely the brain, eyes, ears, heart, and child growth and development, and the impact CRS on a child's quality of life (p-values: 0.007, 0.000, 0.000, 0.001, 0.000, and 0.021 respectively). Topics on prevention of CRS, complications of CRS on various organs, and the impact of CRS on child development were not statistically significant.

DISCUSSION

The handling of Congenital Rubella Syndrome (CRS) cases needs to begin at primary healthcare facilities that directly interact with the community.¹⁴ Front-line clinicians and healthcare workers need to be trained to enhance their knowledge and services related to the promotion and prevention of this disease. In their roles as lifelong learners, healthcare personnel must continuously update and expand their knowledge regarding developments in the healthcare field that support their respective professions. A review conducted by Tabari *et al.* demonstrated that multimodal educational interventions for healthcare personnel had a beneficial impact on participants' knowledge and perception levels.¹⁵ Additionally, primary healthcare facilities often have health cadres who are community-selected

individuals working voluntarily to improve community health.¹⁶ Health cadres were trained and educated by PHC, who play a vital role in educating and socializing the community about various health issues. A review highlighted the essential role of health cadres in preventing diseases like hypertension and its complications.¹⁷ Health cadres are also crucial in organizing *Posyandu* (Integrated Health Post) as health promoters, providing health information to the community, encouraging clean and healthy living behaviors, and inviting people to participate in *Posyandu*.¹⁸ Therefore, the role of health cadres is crucial in communities for disease prevention and education.

The community engagement program includes seminars and information dissemination using educational media such as pocketbooks, banners, and videos. These intervention methods were chosen because they can be efficiently conducted with many participants. Furthermore, researchers aimed to diversify the information delivery methods to ensure that the material reaches participants more effectively. In a meta-analysis on the effectiveness of cadre training, it was found that training using videos combined with discussions increased cadre knowledge by 33%, while training using visual aids,

Table 2. Pre-test and Post-test analysis of the health worker

		Post-test		p-value	
		yes	no		
Pre-test	1. Is Congenital Rubella Syndrome preventable?	Yes	23	2	1
		No	0	0	
	2. Can Congenital Rubella Syndrome affect the brain?	Yes	24	0	1
		No	1	0	
	3. Can Congenital Rubella Syndrome affect the eye?	Yes	25	0	-
		No	0	0	
	4. Can Congenital Rubella Syndrome affect the ear?	Yes	25	0	-
		No	0	0	
	5. Can Congenital Rubella Syndrome affect the heart?	Yes	25	0	-
		No	0	0	
	6. Can Congenital Rubella Syndrome affect a child's growth and development?	Yes	25	0	-
		No	0	0	
	7. Do you know what to do if there is an impact on the brain?	Yes	16	0	0,004*
		No	9	0	
	8. Do you know what to do if there is an impact on the eye?	Yes	16	0	0,004*
		No	9	0	
	9. Do you know what to do if there is an impact on the ear?	Yes	16	0	0,004*
		No	9	0	
	10. Do you know what to do if there is an impact on the heart?	Yes	15	1	0,021*
		No	9	0	
	11. Do you know what to do if there is an impact on your child's growth and development?	Yes	17	0	0,008*
		No	8	0	
	12. Do you know the impact of Congenital Rubella Syndrome on a child's quality of life?	Yes	20	0	0,063
		No	5	0	

*p-value <0,05

seminars, demonstrations, and practical exercises increased cadre knowledge by 70 percent.¹⁹⁻²⁰ The researchers chose PHC as the location for the community engagement program because PHC serves as an interface for health promotion, disease prevention, testing and diagnosis, treatment, and the provision of chronic care.²¹ Comprehensive approach conducted by PHC to promoting health aims to maximize health and well-being levels equitably while focusing on people's needs and preferences, both as individuals and communities, along the continuum from promotion and prevention to treatment, rehabilitation, and palliative care and as close as possible to people's everyday environment. The survey questions were designed based on the importance of knowledge that the community needs to know. Previous research has shown that patients with congenital conditions such as congenital heart disease, congenital hearing loss, low language, and congenital cataracts have a lower quality of life.²²⁻²⁴ These symptoms

are prevalent abnormalities related to CRS, leading to severe morbidity that requires comprehensive multidisciplinary treatment.²⁵ Therefore, it is essential to understand the signs and symptoms of CRS, their impact on life, and what should be done when a case of CRS is identified.

Improving pre-test and post-test scores can be attributed to new knowledge complementing or replacing existing knowledge.²⁶ In this program, knowledge is gained through the interventions conducted, including seminars with discussion sessions led by speakers and using educational media (written and digital). Additionally, the level of activity and interest of health cadres in the material presented should be considered, as it can be related to their knowledge level.²⁶ In this program, the participants showed good enthusiasm and activity levels. Some participants asked the speakers questions, sharing their experiences encountering cases in the field and seeking clarification on the fundamental aspects of CRS.

The World Health Organization

(WHO) has developed a framework for preventing and controlling measles and rubella cases.¹⁴ This framework outlines strategies and actions to achieve "a world free from measles and rubella." One such strategy is the implementation of vaccination programs, including making measles and rubella eradication programs mandatory at PHC, which are also part of universal health coverage (UHC). Primary Health Center is considered the most inclusive, equitable, cost-effective, and efficient approach to enhancing people's physical and mental health and social well-being.²⁷ Measles and Rubella (MR) vaccination in Indonesia began in 2017 and faced various challenges during its implementation. Initially, most Muslim Indonesians opposed this vaccine due to concerns about its use of forbidden (haram) substances based on a fatwa (religious decree) issued by the Indonesian Ulama Council in 2016. However, in 2017, the council ruled that the vaccine could still be used regardless of its production process involving pig-derived materials, leading

Table 3. Pre-test and Post-test analysis of the health cadres

		Post-test		p-value	
		yes	no		
Pre-test	1. Is Congenital Rubella Syndrome preventable?	Yes	25	1	1.000
		No	2	1	
	2. Can Congenital Rubella Syndrome affect the brain?	Yes	23	2	0,687
		No	4	0	
	3. Can Congenital Rubella Syndrome affect the eye?	Yes	27	1	1.000
		No	1	0	
	4. Can Congenital Rubella Syndrome affect the ear?	Yes	23	2	0,687
		No	4	0	
	5. Can Congenital Rubella Syndrome affect the heart?	Yes	24	1	0,375
		No	4	0	
	6. Can Congenital Rubella Syndrome affect a child's growth and development?	Yes	26	2	1.000
		No	1	0	
7. Do you know what to do if there is an impact on the brain?	Yes	2	2	0,007*	
	No	13	12		
8. Do you know what to do if there is an impact on the eye?	Yes	5	1	0*	
	No	16	7		
9. Do you know what to do if there is an impact on the ear?	Yes	4	1	0*	
	No	19	5		
10. Do you know what to do if there is an impact on the heart?	Yes	4	1	0,001*	
	No	15	9		
11. Do you know what to do if there is an impact on your child's growth and development?	Yes	6	1	0*	
	No	17	5		
12. Do you know the impact of Congenital Rubella Syndrome on a child's quality of life?	Yes	11	3	0,021*	
	No	5	0		

*p-value <0,05

to increased MR vaccine coverage.²⁸ Additionally, the government organized National Immunization Month to boost MR vaccine coverage further, accompanied by establishing CRS surveillance.³ Other programs, including this one, can increase vaccine coverage. In addition to educating healthcare personnel and health cadres, it is crucial to educate parents about the importance of this vaccine. Mother's knowledge of rubella is essential in increasing MR immunization coverage.²⁹ It is hoped that by providing training on CRS prevention through MR vaccination, healthcare personnel and health cadres can disseminate this information to the public, thereby increasing MR/MMR vaccination coverage and reducing Rubella and CRS cases in the community.

The study may have focused on a specific region or healthcare facility, limiting the generalizability of the findings to a broader population of health workers and cadres. The intervention aimed at increasing knowledge and awareness may have been implemented over a short

period, making it difficult to assess the long-term effectiveness of the intervention.

CONCLUSION

The community engagement program aims to improve the quality of promotive and preventive education health workers and cadres provide. It also aims to enhance the advanced management of CRS for health workers. The community engagement program helps to increase the knowledge of health workers and cadres regarding the impact of CRS on various organs and improves health workers' understanding of CRS's effects on child growth and development. The primary promotion and prevention efforts for CRS are carried out by increasing the coverage of MR vaccination and conducting CRS surveillance, starting at the primary healthcare facility level. It is essential to train medical personnel and health cadres at the PHC level about CRS so that they can educate the community about prevention efforts and the management of

CRS, creating a healthy society free from Rubella and CRS.

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CONFLICT OF INTERESTS

The authors declare that they have no competing interests. The article has not been previously published and is their original work.

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