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Community Medicine

WEBINAR TRAINING OF EARLY DETECTION OF CONGENITAL HEART DISEASE FOLLOWED BY ECHOCARDIOGRAPHY SCREENING IN BANYUWANGI, EAST JAVA, INDONESIA

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ABSTRACT **Introduction:** The prevalence rate of congenital heart disease (CHD) is considered high. The survival rate at 28 days of life decreased by almost 70% in newborns with CHD. Delayed diagnosis of CHD is believed to be the major reason why this congenital abnormality remains a heavy disease burden worldwide. Banyuwangi is one of the cities in Indonesia which has no pediatric cardologist. This study's aim is to improve the healthworkers's knowledge about early detection of CHD, and to provide the data about CHD's epidemiology in Banyuwangi. **Methods:** Webinar training was delivered through zoom meting by pediatric cardiologists as an intervention. To gauge the knowledge of healthworkers about CHD, we used a pre-posttest design. Paired-sample T-test was used to analyze the score, with p value <0.05 was considered significant. Echocardiography screening was conducted in Banyuwangi by pediatric cardiologists. Participant's gender, age, chief complaints, and type of CHD were obtained. **Results:** 77 participants were attended the webinar training, 43 of them were general pediatricians (55.8%). The mean of pretest and postest score respectively was 9.75/15 and 12.81/15. There was a statistically significant improvement of mean score (p <0.001). From the echocardiography screening we obtained total 17 children. 12 children were diagnosed with acyanotic CHD, 4 children with cyanotic CHD, and 1 child was normal. ASD was the most comon lesion with the total of 5 (29.41%). Shortness of breath and recurrent acute respiratory infection were the most chieft complaints found among screened children (29.41%). **Conclusion:** Webinar training can be an alternative method to improve the basic knowledge among health workers about early detection of CHD. In Banyuwangi, ASD was the most common CHD lesion.

KEYWORDS : congenital heart disease, webinar training, echocardiography, banyuwangi

INTRODUCTION

Congenital heart disease (CHD) is defined as every structural abnormality of the heart and/or large vessels that is present at birth.[1] CHD is considered the most congenital abnormality found in newborn. The etiology of this congenital abnormality is mostly undetermined, despite numerous of CHD incidence. The prevalence rate of CHD in 2017 was 17,9/1000 worldwide, the survival rate at 28 days of life decreased by almost 70% in newborns with CHD, and it was responsible for 261,247 deaths.[2,3] With the prevalence of 9.3/1000 live births, Asia become one of a region with the highest CHD prevalence globally.[4] Regretably, there is no sufficient data which could explain the epidemiology of CHD in Indonesia. One study which is conducted in Sardjito Hospital showed that the incidence rate of CHD in children was 10.4/1000, with ventricular septal defect (VSD) as the most common lession.[5]

One of the major reasons why this congenital abnormality remains a heavy disease burden worldwide is the delayed diagnosis of CHD, particularly in developing country, despite the advances in cardiovascular medicine and surgery over the past decades.[6] Delayed diagnosis of CHD is defined as the CHD is diagnosed after the patient sent home from the birth hospital or others medical facility. This could be determined when a cardiac intervention is immediately needed after the very fist diagnosis.[7] There are 85,1% of children had delayed diagnosis of CHD according to one study in developing country.[8] The other study in Indonesia demonstrated that six out of ten children experienced delayed diagnosis of CHD.[7]

Echocardiography remains a golden standard of diagnosing CHD.[9] Moreover, this diagnostic procedure is considered as a noninvasive but accurate diagnostic tool. However, not all healthworkers are able of utilizing it. Banyuwangi, one of the cities in East Java, Indonesia, has no paediatric cardiologist. Moreover, there is not a single data of that city that could describe the number of CHD. The purpose of this study is to improve the knowledge about early detection of CHD among healthworkers, and to provide the data about CHD's epidemiology in Banyuwangi, East Java, Indonesia.

METHODS

A pre-posttest design is used to evaluate the knowledge of healthworkers about CHD and its early detection. The education method was carried out through webinar training/zoom meeting, by public lectures, playing educational videos about CHD, and discussion session by Zoom Meeting, which conducted on 7th May 2023. The following subjects were used as topic of lectures: Early detection of CHD, Diagnosis and Treatment of CHD, Management of Patent Ductus Arteriosus in Newborn, Identifying Persistent Pulmonary Hypertension in Newborn, and Case Simulation. Bahasa Indonesia was selected as the main language for webinar. Participants were all healthworkers, including general pediatricians, general practitioners, midwives, nurses, and medical student from various fields in Banyuwangi, East Java, were gathered using consecutive sampling. The following were inclusion criteria for participants: age above 18, having ability to communicate using Bahasa Indonesia, are working at Banyuwangi, East Java, and willingness to participate in webinar training. Pre-test was taken by participants to evaluate their basic knowledge about early detection of CHD. Post test was conducted after the intervention was given to the participants. Pretest and postest were the same 15 multiple choice questions in a random order, about basic knowledge and early detection of CHD, based on our previous study. T-test was calculated using SPSS version 20 to analyzed pre-test and post-test results. P value <0.05 was considered statistically significant.

A visitation of echocardiography practice and newborn pulse oximetry screening by Pediatric Cardiologist Consultants was conducted to provide the data of CHD in Banyuwangi, East Java. The visitation was held at 10th June 2023 in Banyuwangi. Participants were all of children who lived in Banyuwangi. The

following were inclusion criteria for this visitation: age below 18, are suspected having CHD by general pediatricians or general practitioners, and have the parent's or their guardian's permission to participate in the echocardiography screening. Participant's gender, age, chief complaints, and type of CHD were collected.

RESULTS

There were 77 participants of the webinar training, consisted of 43 general pediatricians (55.8%), 16 general practitioners (20.8%), 11 nurses (14.3%), 4 midwives (5.2%), and 3 students (2.9%) (Table 1).

The mean of pretest score was 9.75/15. There was not a single participant who could get the perfect score. After the webinar training, participants took a posttest. The mean score was 12.81/15, with 15 participants achieved a perfect score. T-test revealed that mean post-test score was significantly higher than the mean pre-test score (P value=<0.001)

Table – 1 Participants Of Webinar Training

Participants	(N=77)
General Practiotioners, n(%)	16 (20.8)
General Pediatricians, n(%)	43 (55.8)
Nurses, n(%)	11 (14.3)
Midwives, n(%)	4 (5.2)
Students, n(%)	3 (3.9)

Table – 2 Results Of Pretest And Posttest Of Webinar Training

Test	Mean score	P value
Pretest	9.75	<0.001
Posttest	12.81	

From the visitation we found that there were total of 17 children screened by echocardiography examination (male 41.18% and female 58.82%) by 3 pediatric cardiology consultants. Among all the screened children, there were total of 12 who diagnosed with acyanotic CHD, 4 children with cyanotic CHD, and 1 child was normal. Atrial Septal Defect (ASD) was the most common lesion among children (29.41%), followed by ventricular septal defect (VSD) (23.53%) and persistent ductus arteriosus (PDA) (17.65%). In those with cyanotic CHD, 2 children were diagnosed tetralogy of Fallot (ToF) (11.76%). Shortness of breath and recurrent acute respiratory infection were the most chieft complaints found among screened children (29.41%) (Table 3).

Table – 3 Results Characteristics Of Participants In Echocardiography Screening Group (N=17)

Characteristics	Frequency (n)	Percentage (%)
Sex		
Male	7	41.18
Female	10	58.82
Age		
0-5 y	12	70.59
6-10 y	2	11.76
11-15 y	3	17.65
Chief complaints*		
Cyanosis	2	11.76
Growth failure	3	17.65
Shortness of breath	5	29.41
Recurrent acute respiratory infection	5	29.41
Asymptomatic	4	23.53
Type of CHD		
Acyanotic	12	70.59
Cyanotic	4	23.53
Normal	1	5.88
CHD lesion**		
VSD	4	23.53
ASD	5	29.41
PDA	3	17.65
ToF	2	11.76
TGA	0	0
DORV	1	5.88
PS	1	5.88
MR	1	5.88
TR	2	11.76
PR	1	5.88

*1 patient could experience more than 1 sign and symptom

**1 patient could have more than 1 lesion of CHD

LBW= Low Birth Weight; VLBW= Very Low Birth Weight; VSD= Ventricular Septal Defect; ASD= Atrial Septal Defect; PDA=Patent Ductus Arteriosus; ToF=Tetralogy of Fallot; TGA=Transposition of Great Artery; DORV=Double Outlet Right Ventricle; PS=Pulmonal Stenosis; MR=Mitral Regurgitation; TR=Tricuspid Regurgitation; PR=Pulmonary Regurgitation

DISCUSSION

In the time of pandemic, education method was demanded to move online, which nowadays, remote/online education, such as webinar training, has become an ordinary method and can be arranged easily, and yet, education is still one of the essential methods to empower healthcare.[10] One meta-analysis study showed that synchronous distance education, which refer to online (live) education method, had no significant different in effectiveness rahter than the offline method, but had a higher satisfaction ratings.[11] In addition, online education is also much more flexible and cost-effective both the location and time, which make this education method is quite acceptable and more convinient for healthworker who has a very diverse and tight schedule.[10,12,13]

This study showed that the webinar training had a significant role on empowering healthcare's knowledge about early detection of CHD. Two studies which conducted in Bojonegoro and Lumajang, Indonesia, also showed the similar positive result.[14,15] The other study which conducted in Jember also conlcuded that webinar training improved healthcare's knowledge.[16] One comparative interventional study also stated that both the e-learning group and the lecturer (conventional) goup had the same significant improvement on the knowledge about CHD.[17] It can be assumed that webinar training is the effective method, and could possibly replace the conventional one, to improve basic knowledge about CHD.

ASD was the most common CHD lession found in this study, followed by VSD and PDA. One study which conducted in Soeteomo General Hospital Surabaya showed the exact same result. It stated that ASD was the most common lesion, followed by VSD and PDA.[18] Nevertheless, many studies agreed that VSD was the most CHD lesion found in children, but still consistent to mention ASD as the second most lesion. A meta-analysis study of 260 across the world studies elucidated that VSD is the most frequent congenital cardiac anomaly in children, followed by ASD.[19] Many studies in Indonesia showed the same result as well.[5,14–16] However, there is no sufficient explanation that could explain about how ASD and VSD become the most frequent type of CHD lesion.

CONCLUSION

This study concluded that limited knowledge among health workers of CHD could possibly be one of the major obstacles for early screening and identification, as well as timely management. Webinar training can be an alternative method to improve the basic knowledge among healthworkers about early detection of CHD. In Banyuwangi, ASD was the most

common lesion of CHD.

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