Elementary school teachers' perception of Dengue and its environmentally friendly prevention: A focus group study

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Abstract

Understanding teachers' perceptions towards dengue prevention in schools is an important factor for an optimal implementation of dengue prevention and control measures. This qualitative study aimed to explore teachers' perceptions of dengue and its prevention in an environmentally friendly manner. 31 informants were chosen from 6 elementary schools. Data were obtained by Focus Group Discussion (FGD) and then analyzed by using Systematic Text Condensation and an editing analysis style. The results showed that the teachers confirmed the presence of patients with dengue hemorrhagic fever from students and residents living around the school. Most teachers agree and want to know about ovitrap applications in school, which is environmentally friendly. However, most teachers refuse to manage inorganic waste because of the bad experience. Engaging teachers in dengue prevention in schools has a high potential for success as long as it is efficient in terms of time and effort.

Introduction

Indonesia, as a tropical country, contributes to the high number of dengue fever patients in Southeast Asia. Data from the Ministry of Health Republic of Indonesia in 2014 revealed that in the range of 2010-2016, there was a high number of dengue fever cases. Fluctuations also appear in mortality ranges from 2009 to 2016. The highest CFR (Case Fatality Rate) was in 2012 and in general the CFR still exceeds the national target of <1%.[1] As a tropical country, of course, the risk of dengue infection will be higher than non-tropical countries.[2]

Therefore, providing early information on the community needs to be done so people have more awareness with dengue infection. Providing community-based interventions is not always easy.[3] The problems appear when community views do not in line with prevailing strategies as this may preclude prevention and control program in the community. Therefore, it is important to explore the community views as bottom-up program that might increase the chance for success.[4]

The school is an ideal site for the initiation of health promotion application since in school- age children the cognitive and motor skills are formed that assign their future proficiency.[5] It is hoped that from the schools, attaining health literacy in a population can be reached, as schools have a commitment to educating people.[6]

SD (Elementary School) students are a group of young people who are expected to become an agent of change for their families and for the people later. Education for elementary school students can be a strategy in dengue control.[7] It is hoped that introducing knowledge of dengue prevention at an earlier age can be a basis for adult health behaviors. However, elementary school students have not yet been able to make a decision by themselves. They need support, direction, and supervision from their teachers. So, teachers as educators and school managers have an important role to transfer knowledge about prevention of dengue infection to their students.[8] Teachers' perceptions about the prevention of dengue infection are essential in determining the type of interventions that are appropriate for school and elementary school students and are acceptable to schools.

Dengue is a bio-antroposocial event that considers the relationship between biological, epidemiological, social, and cultural data. The role of the vector is strongly influenced by ecological conditions.[9,10] This study was part of community intervention in controlling dengue vectors that did not harm the ecosystem (ecosystem approach).[11]

Interventions that will be proposed involving the school include the application of ovitraps, larval connector book, and inorganic waste management. Ovitrap has also been applied in one of the schools in the work area of Puskesmas (Public Health Center) Kepanjen of Malang Regency[12] and in Argentina and Uruguay, it can motivate schools in the control of dengue vector.[9] Similarly, inorganic waste management has been done by several schools by joining the BSM (Malang Waste Bank). While the dengue connector book in this study has similarities with student self-reporting activities as tested in Thailand. The self-reporting method can improve students' capacity to prevent dengue and reduce the larval index.[13] The diffusion of innovation theory developed by Rogers proposes several characteristics of innovation which has more advantages, proved its suitability, complexity, manageability, and observability.[14]

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Materials and Methods

Study design

Before implementing an ecological approach to preventing dengue which involved students and teachers in August 2013, we invited physical education teachers, homeroom teachers, and headmasters to participate in focus group discussions (FGD). Most of the participants were female teachers (27 people) while the rest were six male teachers. This method was chosen to obtain perception from discussion among several participants. The participants delivered their opinions on dengue prevention activities that were feasible to be conducted in their school.

There were three activities that might be conducted by involving elementary schools. They were ovitraps observation, larval connector book, and inorganic waste management. Ovitrap has also been applied in one of the schools in the work area of Puskesmas Kepanjen of Malang Regency.[9,12] Similarly, inorganic waste management has been done by several schools by joining the BSM. However, larval connector book is the first method they met.

A qualitative study was conducted to describe the perception of elementary school teachers regarding Dengue and its prevention by using an ecosystem approach. As 33 teachers of third until fifth grade from six SD at Malang city, East Java, Indonesia joined the study. Malang is the second largest city in East Java. As 323 SD were spread at 5 sub-districts in Malang.

Subjects and data collection

Focus Group Discussion (FGD) was conducted to explore the teacher's perception before the intervention was implemented. We grouped them based on the class/ grade they handled. There were 4 groups of FGD. They were groups of grade 3, grade 4, grade 5, and headmaster/ sports teachers.

Data analysis

We recorded the voice and transcribed the audio-recorded verbatim. Systematic Text Condensation and an editing analysis style were done. We bracketed our preconceptions, and read the transcribes to get the whole impression and determined previous categories. Then we identified units of meaning representing information about the perception of school' participation in the research.

Perpetually we coded and categorized these units of meaning, checked the similarity and variety, and compressed the content in each category. In the end, we discussed and summarized the content of each group into narrations. To strengthen the analysis we proposed a flowchart (Appendix 1) and discussed the analysis at each step to obtain a conclusion. We provided quotations to describe and strengthen the findings. To conduct member checking, we presented the results to the teachers while we prepared the following actions. We describe more information about methods in the focus group discussion guide and a COREQ checklist (Appendix 2 and 3).

Results

Participants

The demographic distribution of the study sample is shown in Table 1. Most of the participants had at least a high school education. The FGDs comprised headmasters, and teachers. The time needed for one FGD was approximately thirty - forty-five minutes. All participants contributed valuable and important information on all the topics being discussed during FGD. From the FGDs with some teachers, we obtained teachers' perception about the magnitude of dengue fever, the causes of dengue, and the prevention methods that are commonly used and useful for the ecosystem. Some participants' opinions can be summarized in the following themes.

Intrinsic and extrinsic factors cause of Dengue

Teachers argued that dengue patients are mostly residents around the school although sometimes there are students from the school. Dengue is caused by intrinsic factors such as low immunity and extrinsic factors that include puddle, accumulated waste, physical environmental factors, geography - season, lack of hygiene, cultural offerings, the presence of rented/boarding houses, low socioeconomic, and lack of awareness citizens.

"There are many factors ranging from many environmental factors (crowded areas), many slums area, many economic classes, many of them are also affected (neighbors are also affected), the child's immune system is less and low because it is not achieved." (Male teacher)

"Many boarding houses have no boarding mothers so they don't have time to clean up" (Female teacher)

Some teachers still think that puddle can be a breeding place for the Aedes mosquito, whereas actually, Aedes mosquitoes breed in clean water. Other teachers also stated that unclean sewers could be the cause of increased dengue cases.

"There are puddles that do not flow smoothly, there is a place where there are no drains, the second is waste that is not easily decomposed and then stacked." (Male teacher)

The waste management program through the BSM is considered by most teachers to be a cause of dengue case in schools. The program was considered to have failed and even harmed the school

"BSM never took. Even waste from home is taken to school. Garbage at home brought to school finally piled up in school" (Female teacher)

No results achieved by current Dengue prevention

The many preventions action proposed by teachers is increasing awareness about hygiene and 3M (close – drain – bury). In addition, other prevention is the improvement of home hygiene of each student, the use of mosquito repellent lotion, and cleanliness contest. Such prevention activities require sponsorship, while the results do not yet exist despite they have confidence that there will be results.

Most teachers stated that the puskesmas had not helped much in preventing dengue cases. This is marked by the slow response to fogging. Fogging is considered by some teachers as evidence of government attention in preventing dengue cases.

"Not very influential because of the fogging is done if there are reports of citizens." (Female Teacher)

Table 1. Demographic characteristic of the participants.

No	Variable	Frequency (6 SDs)
1	Male Teachers present	6
2	Female Teachers present	27
3	Headmaster sex	50% Female, 50% Male
4	The Presence of The Headmaster	33% present

The role of Puskesmas is still less

Puskesmas were considered not acting except for student immunization, wamantik (larval inspectors students) / dokcil (little doctor) training, and preparation of the contest only. Fogging is done when there are areas around the school that ask for it. In contrast, activities from college students, lecturers, and PKK were held in schools.

"Puskesmas often come when there is vaccination only if vaccination for dengue is not there" (Female teacher)

"Frequently puskesmas still not act" (Female teacher)

"During my time in the elementary school, a person who handles dengue is not there at all, no one cares. I do not know, indeed any care. In the village there is care, in the elementary school does not exist. "(Male teacher)

Safe and environmentally friendly Dengue prevention

According to teachers, safe and environmentally friendly prevention is to raise awareness of 3 M and cleanliness of the physical environment, without using chemicals and smoke (although some mention mosquito spray), mosquito rackets, mosquito nets, herbs and ways to be introduced by researchers i.e. ovitrap. While regarding the larval connector book, the teachers unanimously agreed and even gave input on its contents

"I think that is without smoke, fogging also using smoke because it is feared that like that right ... smoke is not always clean and it is less than the maximum. Probably using other possible ways from you. Using lotions usually do not appropriate, making the itchy and irritation on the skin. "(Male teacher)

Ovitrap application is feasible

Intervention in the form of ovitrap application is very interesting for teachers to learn it and approve it to be applied in school as shown from the following opinions:

"Can be props that might support the sports teachers, homeroom teacher, and also guard school. It's okay we try, the problem is there even though only 1 case. There's nothing wrong we try"(Female teacher)

"It can be. But the person responsible is the health and sports teacher. In the 2013 curriculum, children are taught to be researchers and care about the environment "(Female teacher)

Inorganic waste management is not allowing

The effort to involve BSM in the management of inorganic waste did not get a good response from the school because the school assesses the waste pick up schedule is not clear. As a result, schools have to sell their own waste because of the difficulty of waste shelters.

"For the management of inorganic waste, cooperation with BSM, once lasted 1 year. The obstacles are the children are embarrassed to bring waste to school, the shelter is not there, and time-consuming. The separation of wet and dry trashes exists but remains mixed. Everyday garbage is taken, officers. It's been sorted out but inside the cart was mixed again. "(Female Teacher)

Unclear of waste pick up by BSM occurred due to an incompatibility of waste pick up schedule with the availability of teacher time. BSM has a route of waste pick up where the duration of waste pick up cannot be predicted, depending on the amount of waste deposited by the community. Meanwhile, the teacher's schedule is also limited because of busy teaching and keeping his students.

Obstacles

The effort that has been done by the school so far is to remind students of the cleanliness of the school even though the teachers are busy and providing buckets for school. But there are no wamantik in these schools. Even if the puskesmas has dokcil, in general, there is no continuation due to lack of opportunities students who have been trained to socialize prevention of dengue fever to his friends.

"Actually, the students who are trained have got knowledge and books about Dengue, but the problem is how to transfer the knowledge has been obtained, most of the children still have difficulties or do not have the opportunity to convey the knowledge they have gained." (Female Teacher)

Constraints are also often faced by the school is often the turn of leadership so that the program is also changing, high teacher busyness, and when the rainy season school becomes dirty. School cleanliness is generally the main task of Pak bon (school cleaning staff) but not all Pak bon is aware of the duty. The role of the headmaster is very big in monitoring the work of Pak bon. Meanwhile, parents are less supportive when students are asked to work in school because school cleanliness is considered as the responsibility of Pak bon. The following interview quotes support the above statement.

"Routine clean up activity is actually effective enough to make the school environment clean. But in classroom cleaning activities, parents do not like when their children spend time or feel hired to clean up" (Female Teacher)

Discussion

It was revealed that teachers' perceptions include the presence of offerings in the tomb that cause dirty and may be able to accommodate rainwater so that a mosquito breeding place. This is in line with research in several Southeast Asian countries where water containers for religious purposes also have potential as breeding grounds for Aedes mosquitoes. In addition, densely populated areas, as mentioned by teachers, also have the potential to accelerate the transmission of Dengue.[15] Low immunity also become one of the factors of a person susceptible to dengue.[2]

Nevertheless, there are some opinions that need to be straightened out about the causes of dengue such as the number of wild plants, and puddles. Wild plants or shrubs are more associated with the number of Aedes albopictus mosquitoes that are usually found outside the home or garden. Similarly, water puddles are often associated with dengue, which is less precise, since Ae. aegypti is more common in clean water than in dirty water.[16] While water puddles occur more frequently outside the home, so the water is often dirty and is not a breeding ground for Aedes mosquitoes. Puddle can also become a breeding ground for Aedes mosquitoes.[17]

School efforts in preventing dengue during this time also appear not yet specific for prevention of dengue or still general, for examples: Friday Clean, Cleanliness Competition, and motivate students to keep clean. However, these efforts if done regularly will be able to reduce the mosquito breeding place as well. Cleanliness is one of the methods mentioned by teachers to prevent dengue fever in an environmentally friendly manner as it can reduce mosquito breeding grounds.[18] Cleanliness is usually a cause that is often thought to increase the risk of dengue.[19]

While waste management is usually considered as a factor that related to mosquito breeding sites.[19] But managing inorganic waste is another problem. Inorganic waste management involving other parties, namely BSM, it seems unlikely to be applicable in these schools because of the unsuccessful experience of cooperation with BSM a few years earlier. However, the efforts of inorganic waste management involving BSM can continue

to be improved because in some schools such efforts can go well.

School efforts often experience difficulties either from their own schools, parents, education offices, and nature. The change of headmaster is often a constraint because there is usually a change of program. School leadership plays an important role in commanding all subordinates in maintaining cleanliness. The busyness of teachers in school or limited time in school can be overcome by integrating the knowledge of dengue with existing lessons, such as Natural Sciences. Communication between schools and parents also needs to be improved so that no misunderstandings occur in terms of involving students maintaining school hygiene.

Student involvement in maintaining school hygiene is prevalent in many countries. The hope is that students have a caring and environmental responsibility and are environmentally sensitive. To achieve the participation of all parties in the school, it requires leadership of the headmaster. Participation and leadership are closely related to each other because leaders need strong participation from those led. On the other hand, participation also requires a strong direction and leadership structure.[20]

Unfortunately, schools are often still very dependent on puskesmas, especially in terms of health education to students. Health workers in puskesmas are often also limited to serve one-third of the district's population. Therefore, the cooperation between puskesmas and schools needs to be improved, not only when it will follow the race, but also in routine prevention activities in schools. It appears that schools consider that dengue control is the sole responsibility of the government as it does in Trinidad and Tobago.[21] Besides, in addition, their dependence on the government through fogging is still high. This is also found in other countries.[19]

The environmentally friendly method of dengue fever prevention is defined by most participants as a way of not using chemicals or fogging, altering the physical environment, using herbs, and using tools. This finding is in line with another study in Malaysia which stated that non-chemical control alternatives or natural methods to repel mosquitoes are preferred by participants study. These methods can maintain ecosystem services for the community as they can prevent water contamination and improve hygiene and health culture in the community.[22]

On the other hand, ovitrap, as a method that is considered new by the teachers even invite their curiosity. Ovitrap is expected to be a student learning medium.[16] However, teachers also want to know the effectiveness of ovitrap. Something new seems to encourage people to try it. However, once a method is perceived as unsatisfactory, it seems that the method will be difficult for people to accept again.

Conclusions

Teachers have responsibilities to implement dengue prevention in the schools. Engaging teachers in dengue prevention in schools has a high potential for success as long as it is efficient in terms of time and effort.

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