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Determinant of Environmental Disease in Health Promotion of Community Lead Total Sanitation (CLTS) on Elementary Students as Primary Prevention in Isolated District, Indonesia

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Abstract

West Kalimantan was called “a thousand rivers, that many place in isolated area. Discoveries that emerging and re-emerging pathogens have their origin in environmental change has created an urgent need to understand how these environmental changes impact disease burden. Prevalence of environmental based disease is high enough in this area. The aimed of this research was to identify determinants factors of environmental disease in isolated area of West Kalimantan in Health promotion effort of Community Lead Total Sanitation (CLTS) as primary prevention at elementary school students in 2015. The method used quantitative research with cross sectional approach and total sampling at elementary students (80 students at third, fourth, and fifth grades in Isolated

District). The results showed that the significant determinant of environmental disease are: knowledge (p value = 0.000), attitude (p value = 0.000), the practice of Clean and Healthy Behavior (p value = 0.005), and latrine ownership (p value = 0.000). Knowledge, attitudes, and practices of PHBS are protective factors that can prevent environmentally based disease incidence (OR <1). Based on the results of this study, media favored by elementary students are comic, and short movie. School children are the future generation and potentially trigger to apply Community Lead Total Sanitation (CLTS). They are also as agents of change in a family environment, so as to stimulate the family to apply CLTS in particularly, and society in generally. Therefore, health promotion CLTS required for elementary students as agents of change so as to reduce the incidence of environmental disease through the comic and the movie according to the needs. In addition, the need for cooperation with local governments in the provision of public facilities and infrastructure in communities in isolated district.

Keywords: Sanitation, Health Promotion, Community Lead Total Sanitation (CLTS), Environmental Disease, Primary Prevention

Introduction

Public health scientists are increasingly discovering that the recent emergence or re-emergence of infectious diseases has an origin in environmental change [1,2]. These environmental changes encompass social processes such as urbanization and creation of transportation infrastructure, as well as ecologic [3].

West Borneo is one of the provinces which has a lot of isolated district. It is due to the fact that West Borneo (West Kalimantan) is surrounded by rivers (well-known as ‘thousands of river’. Therefore, reaching the district is not easy. The prevalence of environmental disease is sufficiently high in these isolated district, like: diarrhea, malaria, ISPA, dengue fever, tuberculosis, dermatological disease, and worm infestation (especially found in school year children). People in these district have minimum access to health information and adequate facilities and infrastructures. Besides, low level of social and economy status is another reason which deteriorates this problem.

Human behaviors and their surroundings are highly influence in this environmental

disease problem [3]. Epidemiology studies show the correlation between determinant of environmental and diseases, so that identification of those risk factors is needed [4]. The previous studies which were conducted by Kumar and Harada (2002) show that sanitation and significant air pollution are pertained to these diseases; typhus, diarrhea, and malaria. These things are positively correlated with water consumption pattern and poverty (including unhealthy house environment and social economy situation of the families) [5]. In addition, air pollution is also the infection factor of the environment-based disease [6]. This disease can be prevented by creating health environment and behavior [7].

Community-Led total sanitation (CLTS) offers a new, peoplecentric approach conceptually grounded in participatory development. But despite its broad appeal, the CLTS policy narrative has become equated with quick results, low-cost, provocative language and the potential for community self-help [8]. Bulaya *et al.* (2014) revealed that CLTS as a control measure did not significantly improve *T. solium* infections in pigs. The research also revealed that the sanitation practices and awareness of cysticercosis did not change. It is recommended that a longer term evaluation be undertaken when the villages have been declared open defaecation free [9]. Health education, as one of an essential component of prevention and control programmes for environmental disease. One of the possible control measures is the improvement of basic sanitation, hygiene and health education, which has proved to be an efficient strategy for many parasitic and infectious disease transmitted by faeces [10].

The aimed of this research was to know the determinant of environmental disease in isolated district to promote Community-Lead Total Sanitation (CLTS) on Elementary Students as Primary Prevention.

Materials and Methods

The method used quantitative research with cross sectional approach and total sampling at elementary students (80 students at third, fourth, and fifth grades in Sepuk Laut District). This research was conducted on March-June 2015.

The instrument for data collection was questionnaire which was obtained from various literatures. Questions were developed in English and were translated into Indonesia by an expert translator. Before the questionnaire was used, research instrument test was conducted to know the validity and realibility of the instrument. It was used 30 respondent that had similar characteristic with respondent in this research. The result showed that all of the item questionnaire was valid and reliable ($r > 0,3$ and alpha cronbach $> 0,7$).

Data collection was conducted by having interview with respondents. Analyzing data was used Chi-Square tests.

Results and Discussions

Here is the result of univariat analysis of 80 respondents in this research:

Table 1. Univariat Analysis

No	Variable	N	%
1.	Knowledge		
	Not good	30	37,5
	Good	50	62,5
2.	Behavior		
	Not supportive	38	47,5
	Supportive	42	52,5
3.	Health and clean lifestyle		
	Not good	46	57,5
	Good	34	42,5
4.	Possession of lavatories		
	Yes	60	75,0
	No	20	25,0
5.	Environmental disease		
	Yes	62	77,5
	No	18	22,5

Source: Primary data, 2005.

The table above showed that the respondents' knowledge was bad (37.5%), unsupportive behavior (47.5%), bad clean and health lifestyle (57.5%), those who do not possess lavatories (75.0%), and got environment-based disease within 6 months (77.5%).

The result of bivariate analysis can be seen in the following table:

Table 2. Result of bivariat analysis with Chi-Square Test

No	Variable	The occurrence of environment-based disease		
		<i>p value</i>	PR	95% <i>Confidence Interval</i>
1.	Knowledge	0,0001	0,486	0,330 – 0,716
2.	Behavior	0,0001	0,608	0,460 – 0,804
3.	Health and clean lifestyle	0,005	0,693	0,552 – 0,870
4.	Latrines	0,0001	3,800	1,775 – 8,136

Source: Data Analysis by using SPSS, 2005.

Knowledge is a protective factor in environment-based disease cases. The result of this research showed that “good knowledge” about sanitation and clean and healthy lifestyle could prevent 2,06 times someone from having environment-based disease compared to those who lack of knowledge. In contrast, Williams (2009) revealed that there was significant correlation between knowledge and waterborne disease [11]. This knowledge is influenced by education. In addition, the previous research showed that low level of education more likely to have minimum of knowledge. Therefore, it would influence the occurrence of diseases (including diarrhea) [12],[13]. Moreover, the research was conducted in Zimbabwe, showed that knowledge about sanitation and contagion had positive behaviour in prevention of *waterborne disease* [14].

As well as knowledge, Behaviour is a protective factor in environment-based disease. This research showed that positive's behaviour regarding sanitation could prevent 1,6 times environment-based disease compared to those who are not positive. The negative behavior about sanitation are more likely potential having environment-based disease (including *waterborne*

disease) [15]. According to previously survey, healthy lifestyle would impact on human health status [16-17]. Positive behavior needs to be nurtured in order to create positive actions. Positive action could prevent the dehydration of diarrhea [18].

Clean and Healthy Behavior (PHBS) is also the protective factor in the occurrence of environmental disease. This research showed that the healthy and clean lifestyle could prevent environment-based disease 1,4 times. These healthy and clean lifestyles are influenced by knowledge and practice of Clean and Healthy Behavior. The result of this research shows that there is a significant relation between knowledge (*p value = 0,004 and OR = 5, 091; 95%CI = 1,773 – 14,615*) and behavior (*p value = 0,035 and OR = 2,971;95%CI = 1,175-7,514*). Green theory stated that behavior is influenced by predisposing factors which are knowledge and behavior. These behaviors and knowledge will form or lead the realization of certain attitude. Children is a potential target group of PHBS promotion, especially on elementary school children. They have active in playing with soils (the medium of the disease infection). PHBS program at elementary school children could be started with simple thing such as washing hands by using soaps, brushing teeth, and cleaning their nail and hair. These activities can help reduce the risks of the occurrence of diseases, such as diarrhea and worm infestation which frequently attacks school age children (6-12 years old that is actually related to PHBS).

Hand hygiene has been shown to reduce the incidence of respiratory and gastrointestinal infections [19]. Despite its simple, cost-effective nature, adequate hand washing is rarely practiced [20].

The possession of lavatory was risk factor of the occurrence of environment-based disease ($PR > 1$). Respondents who do not have lavatory or water closet more likely get infected by environmental disease 3,8 times compared to those who have lavatory. The supply of lavatory facilities is a part of important sanitation efforts. Viewed from health perspective, feces and waste can pollute the environment particularly soil and water source. Using of latrines as health behavior enabling factor is the most dominant determinant in using water closet. Availability of latrine was one of health's family facilities enables the family members to use latrines as

facilities to defecate [21].

Faeces were considered disease-causing agents; notions of “proper hygiene”¹ emphasised latrine use, that faeces were not to be used to fertilise crops and that latrines had to be constructed away from homes to avoid “bad odours.” In agreement with Green (1999) *cit* Bardosh (2015), local aetiologies of sanitation-related diseases (cholera, bilharzia, soil-transmitted helminths, porcine cysticercosis and diarrheal diseases) followed naturalist perspectives through food, water, air, insects and animals [8]. Their health and livelihood impacts were well appreciated; 64% of families in my household questionnaire reported at least one member with severe diarrhoea and 11% with intestinal worms within the last six months, equivalent to a recent parasitological survey in Katete [22]. Some diseases which can be spread out by human’s feces such as; typhus, dysentery, cholera, various of worms (pinworms, bracelet worms, ribbon worms), schistosomiasis etc. To prevent the contamination of feces to environment, human’s defecation disposal must be managed well. Defecation must be in certain places or healthy water closet.

¹Open defecation, both symbolically and practically, represented an embedded marginalisation from the modern Zambian state where multiple barriers to latrine construction coexisted in the context of fragile livelihoods. In such agrarian communities, CLTS cannot be conceptualised as a blanket approach quickly bringing total sanitation to the masses. For its strengths to be realised in contexts of rural poverty, a targeted strategy that builds local institutional capacity and iteratively scales-up over time is needed [8]. Miko *et al.* (2013) revealed that more women than men reported consistent hand washing before preparing food ($p = .002$) and after using the toilet ($p = .001$) [23].

Conclusion

Determinant of environmental diseases in this study (at elementary school students) are knowledge about sanitation and healthy and clean lifestyle, behavior towards sanitation, healthy and clean lifestyle, and possession of lavatory. Health education is needed to increase knowledge, behavior, and healthy and clean lifestyle of people in isolated district, so that it can

prevent the occurrence of environmental disease. It is needed to have intervention as primary prevention on elementary school students to promote their knowledge and behavior regarding sanitation and healthy life style.

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