Elementary school students' knowledge on environmental health

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Abstract. Healthy behavior is one of the main things to maintain life, especially in a pandemic situation. Therefore it needs to be instilled early to form a persistent behavior. Several studies have shown that knowledge is one of the factors that influence hygiene behavior. This study aims to determine the knowledge of elementary students about environmental health. This research is a quantitative study using a survey method. The sample in this study were students in grades 4, 5 and 6 in two schools in South Tangerang. The results show that elementary students' knowledge of environmental health is in the very good category. This is indicated by the average achievement of 96.73 of the ideal score.

Keywords: students, knowledge, environmental health, behavior

1. Introduction
Covid-19 pandemic that began in the late of 2019 in Wuhan, China, has been emerging as global citizens concern. This pandemic spread fast, and as early this November already suffering more than 40 million people and killed to almost 1.3 million in the world [1]. The phenomenon for many people has recharged the awareness of the importance of hygiene behavior. Studies and WHO suggest that this disease could be minimized effectively by “simply” physical distancing, wearing mask, and washing hand with water and handsoap [2]. In Indonesia, those are called 3M (Menjaga jarak, Memakai Masker, dan Mencuci Tangan dengan sabun). Those 3M are basically part of practicing hygien behavior.

Behavior, as a human aspect, has many influencing factors. one of it is knowledge. Knowledge on environmental health is crucial to maintain healthy life. As it is crucial, it needs to be inhabit early. Elementary School ages are important stage to implant a concept and habit, included healthy life. Elementary school students formally already interact with “new” environment from their home environment. In Indonesian context, many school students buy snacks, foods, and drinks at school although they bring foods and drinks from home. They play, work, learn, eat, drink, and do what they do at home in school, including using toilet. WHO mentioned that many children in the world still suffer from infectious disease and cause death. Based on WHO data in 2019, Indonesia is in the top 10 countries with the highest number of death of children under 5. While for preventing older children mortality, WHO put water and sanitation as one of the aspects to emphasis asa well as education, transportation and road infrastructure, and law enforcement. Since elementary children time spent in school is significant, majority half day or even more, it is important to capture elementary school students knowledge on environmental health.

World Health Organization [3] address environmental health deal with all physical, chemical, and biological factors around an individual, and all relevant factors that influent behavior. It includes evaluation and controlling of potential affecting environmental factors of health. These all aim in preventing diseases and creating an environment that support health. Indonesian government document of rules stated that environmental health is efforts to prevent disease and or health problems
from risky environmental factor in creating a healthy quality environment physically, chemically, biologically, and also socially [4].

Environmental health has been discussing by many parties, one that should be refered is WHO. WHO suggest 12 topics of environmental health. They are (1) Air pollution in surroundings, (2) household air pollution, (3) water, (4) sanitation and hygiene, (5) safety of chemical substances, (6) radiation, (7) climate change, (8) crucial environmental health, (9) work place, (10) cities, (11) residents, and (12) health facilities [1]. Children are mainly fragile and threat by the risk of environmental factor such as air pollution, water, inappropriate sanitation and hyginene, chemical substances and waste, radiation, and climate change.

This study focus on school environment-related factors, ie. Water and sanitation-hygiene. Water is crucial for human being and other creatures people around the world drink water from many sources and ways. The water could be safe or not safe to consume. Unsafe water causes disease such as diarrhea and parasit-related disease. It is very important to have safe water for food and sanitation in order to protect health. Sanitation not only aims to prevent disease by preventing contact with pathogenic or parasit in waste/disposal, but also to raise human pride and welfare. Hygiene, such as washing hand, could minimize infection agent from hands and prevent disease spread.

Knowledge is result of knowing, which happen after an individual sensing/observing on a specific object. It is a very important domain in shaping an individual behavior [5][6]. Suriasumantri [7] suggest that knowledge is basically all we know about a specific object. Knowledge is in cognitive domain of human physiological studies. The cognitive hierarchial sytem developed by Bloom known as Blooms Taxonomy is widely use. Krathwohl, D. R. revised cognitive domain in four aspects, they are factual, conceptual, procedural, and metacognitive [8].

2. Methods
This study implement survey method. Respondents of this study are students of two state elementary school in South Tangerang Distric of Banten Province, Indonesia. The respondents are from 4th, 5th and 6th graders. A set of test used to measure student knowledge on environmental health. The instrument developed based on WHO important topic of environmental health that closely related to elementary students daily life in school, namely water and sanitation. It covers three domain of cognitive aspect: factual, conceptual and procedural. There are 26 six valid items with 0.955 (alpha cronbach) as shown in Table 1. Data collected in April 2020 using google form as online learning implemented during the pandemic.

| Cognitive Domain | Number of Items | Total |
|------------------|----------------|-------|
|                  | Sanitation     | Water |       |
| Factual          | 3              | 2     | 5     |
| Conceptual       | 5              | 3     | 8     |
| Procedural       | 9              | 4     | 13    |
| Total            | 17             | 9     | 26    |

3. Result and Discussion
The total number of respondents from two elementary schools are 450 students as shown in Table 2. Based on Dapodik [9], the sample of this study consist 55,02% of total population (986 students). However, the respondents that filling the test consist 45,69 % of total sample (450 students). Boys number consist 47,11% is less than girls that consist 52,89% of respondents. From grade point of view, the number of respondent from grade 4, 5, and 6 have not big difference.
Table 2 Respondent Profile

| Respondent Profile | School A | School B | Total | Percentage |
|--------------------|---------|---------|-------|------------|
| **Gender**         |         |         |       |            |
| Boys               | 122     | 90      | 212   | 47.11      |
| Girl               | 134     | 104     | 238   | 52.89      |
| Total              | 256     | 194     | 450   | 100.00     |
| **Grade**          |         |         |       |            |
| 4                  | 82      | 61      | 143   | 31.78      |
| 5                  | 89      | 64      | 153   | 34.00      |
| 6                  | 85      | 69      | 154   | 34.22      |
| Total              | 256     | 194     | 450   | 100.00     |

Based on the collected data, the score of elementary schools knowledge on environmental health is 25.15 in average with standard of deviation 1.416; minimum score 14, and maximum score 26.00. The score equal to 96.73 % ideal score. As it almost reach the ideal score, it could be said that the elementary schools knowledge on environmental health is already in very good category. In addition, more than half of respondents achieve ideal score of 26. It might be caused by the awareness of health has risen significant as pandemic run. Nobody wants to suffer from the covid 19 or even die. So there are no alternative except maintain and always implement hygiene behavior especially washing hand that include in 3M discipline. The campaign of hygiene so massive during the pandemic. It could explain the data. It is good, to know that students already aware of health aspect especially on water and sanitation, and we could hope by this knowledge as basic modal, they could maintain their health is undirect ways. However, it is not necessarily same with the behavior.

The frequency distribution of elementary schools knowledge on environmental health score available in Table 3. Although the majority of student has have very sufficient knowledge, there are several that still in low understanding of environmental health aspect in school context. If we do not want any student left behind in this case, teacher and school should give special attention to them. For 4-6 graders, guidance and modelling from teacher is more effective to make behavioral change than teaching only.

Table 3 The frequency distribution of elementary schools knowledge on environmental health

| No | Score | % of ideal score | Frequency | Percentage |
|----|-------|------------------|-----------|------------|
| 1  | 14.00 | 53.85            | 1         | 0.22       |
| 2  | 16.00 | 61.54            | 2         | 0.44       |
| 3  | 18.00 | 69.23            | 3         | 0.67       |
| 4  | 19.00 | 73.08            | 1         | 0.22       |
| 5  | 20.00 | 76.92            | 1         | 0.22       |
| 6  | 21.00 | 80.77            | 1         | 0.22       |
| 7  | 22.00 | 84.62            | 8         | 1.78       |
| 8  | 23.00 | 88.46            | 15        | 3.33       |
| 9  | 24.00 | 92.31            | 42        | 9.33       |
| 10 | 25.00 | 96.15            | 147       | 32.67      |
| 11 | 26.00 | 100.00           | 229       | 50.89      |
| Total |       |                   | 450       | 100.00     |
In general, there is no difference between boys and girls knowledge on environmental health. Figure 1 shows that the average of three aspect of cognitive domain are at very good level as they are nearly reached maximum score. However, between the three, factual aspect of cognitive aspect is less than the other two (conceptual and procedural). Good living is one of basic human right. Gender difference is not applicable in health needs. Girls and boys have equal needs as well as facilitation to maintain good living. The data of this study represent the concept of gender equality in health.

![Figure 1. Students Environmental Health Knowledge Based on Gender](image1)

The same case with grade point of view, that there is no difference between 4th, 5th, and 6th graders knowledge on environmental health. Figure 2 shows that the average of the three grade are similar in the three aspect of cognitive domain. This could be determined by their character similarity in cognitive level, which is concrete operational, and also the success of hygiene campaign in the pandemic situation. Although 6th graders might be more “mature” than the other two, the massive and very frequent campaign of the importance of hygiene looks have uniform their knowledge without grade borders.

![Figure 2. Students Environmental Health Knowledge Based on Grade](image2)

4. Conclusion
This study finds that elementary students knowledge on environmental health is in very good category. There is no difference between girls and boys achievement, as well as grade. However, there are several student that need more attention to make sure there is no student left behind in health status. Although in general it is good, environmental health knowledge does not necessarily match with the
behavior it is important to capture the behavior to make sure student implement health partice in school

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