

The Effectiveness of Health Education to Increase Knowledge on Life Cycle of *A. lumbricoides* among Orphans in Lubang Buaya Village, East Jakarta

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Abstract

The prevalence of ascariasis in Indonesia remains high, especially in children who live in crowded area. Knowledge on *A. lumbricoides* is the key in preventing ascariasis. The purpose of this research is to know the effectiveness of health education in increasing the knowledge on the life cycle of *A. lumbricoides* among the orphans. This experimental study (pre-post study) was conducted at orphanage in Lubang Buaya Village, East Jakarta. The data was taken on June, 12th 2012 by handing out questionnaires about the life cycle of *A. lumbricoides* to the subjects before and after health education. All orphans who gathered were becoming the research subjects. Data was processed using SPSS 11.5 and tested with marginal homogeneity. The results show the numbers male subjects and female subjects are 59 (41.5%) and 83 (58.5%), 78 primary school (54.9%), 55 junior highschool (38.7%), and 9 senior highschool students (6.4%). Before health education, the numbers of respondents with good, fair, and poor knowledge level of *A. lumbricoides* were 1 (0.7%), 11 (7.7%), 130 subjects (91.6%). After education, the number of subjects with good and fair knowledge increased to 8 (5.6%) and 50 subjects (35.2%), while poor knowledge decreased to 84 (59.2%). Marginal homogeneity test showed a significant difference ($p < 0.001$) between the orphans' knowledge before and after health education. In conclusion, health education is effective to increase knowledge of *A. lumbricoides* in orphans.

Keywords: knowledge level, health education, orphans, ascariasis.

Efektivitas Penyuluhan terhadap Peningkatan Pengetahuan Siklus Hidup *A. lumbricoides* pada Anak Panti Asuhan di Kelurahan Lubang Buaya, Jakarta Timur

Abstrak

Askariasis memiliki prevalensi yang masih tinggi di Indonesia terutama pada anak yang tinggal di daerah padat penghuni. Pengetahuan tentang *A. lumbricoides* merupakan kunci pencegahan askariasis. Tujuan penelitian ini mengetahui efektivitas penyuluhan untuk meningkatkan pengetahuan anak panti asuhan mengenai *A. lumbricoides*. Penelitian experimental (pre-post study) dilakukan di panti asuhan X, Kelurahan Lubang Buaya, Jakarta Timur. Data diambil pada tanggal 10 Juni 2012 dengan mengisi kuesioner sebelum dan setelah penyuluhan. Semua anak yang hadir saat penyuluhan dijadikan subyek penelitian. Kuesioner berisi pertanyaan tentang siklus hidup *A. lumbricoides*. Data diolah dengan program SPSS versi 20 dan diuji dengan marginal homogeneity. Hasil penelitian menunjukkan 59 (41,5%) responden adalah laki-laki dan 83 (58,5%) perempuan; terdiri atas 78 murid (54,9%) SD, 55 murid (38,7%) SMP, dan 9 murid (6,4%) SMA. Sebelum penyuluhan, tingkat pengetahuan baik, sedang, dan kurang dimiliki oleh 1 responden (0,7%), 11 responden (7,7%), dan 130 responden (91,6%). Setelah penyuluhan, jumlah responden dengan pengetahuan baik dan sedang meningkat menjadi 8 responden (5,6%) dan 50 responden (35,2%) sedangkan responden dengan pengetahuan kurang menurun menjadi 84 responden (59,2%). Uji marginal homogeneity memberikan $p < 0.001$, berarti ada perbedaan bermakna pada hasil sebelum dan sesudah penyuluhan. Disimpulkan penyuluhan efektif meningkatkan pengetahuan responden mengenai *A. lumbricoides*.

Kata kunci: tingkat pengetahuan, penyuluhan, anak yatim piatu, askariasis.

Introduction

Ascariasis is a disease caused by *A. lumbricoides*.¹ It might infect both adults and children; however, children are more commonly infected by the worm. This might be due to the fact that children tend to put things in their mouths. Humid temperature, tropical climates, crowded conditions, improper water supply, and poor personal hygiene may help the outbreaks of parasitic infections.²

In Indonesia, the prevalence of ascariasis remains high.¹ In 2008, the prevalence of ascariasis in elementary school students in North and West Jakarta are 80% and 74%, respectively.³ Malnutrition, anemia, growth retardation are the examples of clinical findings in patients who are infected by *A. lumbricoides*. These conditions occur in severe infection in which helminthes absorb nutrients, decreasing appetite, causing diarrhea, and constipation. Along with the progression of the disease, immune system of the children is also being suppressed, allowing other diseases to develop. Furthermore, decrease in work productivity will occur and these conditions might lead to decreasing quality of life.⁴

There are several factors that determine the occurrence of disease, including *A. lumbricoides* infection. Generally, there are three factors affecting the occurrence of a disease; the host, the agent, and the environmental factors. Some of these factors are modifiable, while the others are un-modifiable. A disease will occur once the equilibrium of these factors is disturbed. The theory that explains the occurrence of a disease and the factors related is called the triad epidemiology theory.⁵

The host factor is mostly un-modifiable and very individual, differ from one person to another. The host factors decide the outcome of the interaction among other factors. The host factors are age, sex, ethnicity, occupation, literacy level, income, marital status, nutritional status, and life-style.⁶ On the other hand, the agent and environmental factors might be modified.⁵

In Lubang Buaya Village, East Jakarta, there is an orphanage with a crowded population, thus it is predicted that the prevalence of ascariasis in that orphanage is high. In order to increase the awareness of the orphans on ascariasis, health education is needed. Thus, we give health education to the orphans. To know the effectiveness of health

education, survey on the orphans' knowledge level before and after health education was conducted.

Methods

Experimental study, more specifically, pre-post study was used to study the effectiveness of health education to increase the knowledge on the life cycle *A. lumbricoides* among the research subjects. This research was conducted in 11 months, starting on March 2012 until February 2013. The data was taken on June, 10th 2012 at orphanage X in Lubang Buaya Village, East Jakarta.

All the subjects from orphanage X in Lubang Buaya Village, East Jakarta, who were present during the event held, were included as total population. This was to make sure that justice was served by allowing all subjects from the orphanage to participate in this research.

Questionnaire containing 6 questions about the life cycle of *A. lumbricoides* was used as main data source to study the level of knowledge and health education was given once all the pre-test questionnaires were collected. The health education was given by a health professional. During the health education, the subjects were given the opportunities to ask questions. After the health education, the researcher handed out the post-test questionnaires which contained the same questions as the pre-test questionnaires. The subjects then once again were being asked to complete all of the questions in the questionnaires. After all the questions were completed, the questionnaires were being collected.

The data were processed by using SPSS 20 program. Data analysis was conducted in two ways; univariate analysis and bivariate analysis. In univariate analysis, every variable was analyzed with distribution of absolute number and/or percentage with qualitative explanation. In bivariate analysis, cross table would be used to analyze the relation between 2 variables using marginal homogeneity test.

Results

To study the effectiveness of health education in improving the orphans' knowledge on the life cycle of *A. lumbricoides*, all orphans were involved (142 subjects). There was no drop-out in this research; thus, all data could be analyzed.

Table 1. Distribution of Subjects' Gender, Education, History of STH, and Activities Outside the School

| Variable | Category | Frequency | Percentage |
|---------------------------|-------------------|-----------|------------|
| Gender | Male | 59 | 41.5 |
| | Female | 83 | 58.5 |
| Level of formal education | Primary school | 78 | 54.9 |
| | Junior highschool | 55 | 38.7 |
| | Senior highschool | 9 | 6.3 |
| | | | |
| History of STH | Yes | 47 | 33.1 |
| | No | 95 | 66.9 |
| Activities outside school | Playing soccer | 25 | 16.2 |
| | Qur'an reading | 112 | 72.7 |
| | Others | 17 | 11.1 |

From table 1, it is known that the total subject of this research was 142 orphans with domination on female subjects. Majority of the subjects were primary school students (54.9%), followed by junior high school (38.7%) and senior highschool students (6.3%). It is seen that 66.9% of the subjects had never had STH infection throughout their lives. Qur'an reading was the most popular activity outside school activities among the orphans (78.9%) followed by playing soccer (25%), and other things such as playing video games (17%).

Table 2. Distribution of Subject's Knowledge on Life Cycle of *A.lumbricoides* and Related Factors before the Health Education

| Variable | Category | Knowledge level | | | p |
|-----------------------------|---------------------|-----------------|-------|-------|-------|
| | | Poor | Fair* | Good* | |
| Gender | Male | 55 | 3 | 1 | 0.307 |
| | Female | 75 | 8 | 0 | |
| Level of education | Primary school | 72 | 6 | 0 | 0.783 |
| | Junior high school* | 50 | 4 | 1 | |
| | Senior high school* | 8 | 1 | 0 | |
| | | | | | |
| History of STH | Yes | 42 | 5 | 0 | 0.532 |
| | No | 87 | 6 | 1 | |
| Activities outside school** | Playing soccer | 23 | 2 | 0 | 1 |
| | Qur'an reading* | 103 | 8 | 1 | |
| | Others* | 15 | 1 | 0 | |
| | | | | | |

*for the importance of data analyzing, the data in the fair and good column are combined.

**subjects might choose more than 1 activities.

Table 2 shows that only 1 subject (0.7%) who had had good knowledge on life-cycle of *A.lumbricoides* before the health education; he was a junior highschool student, never had any history of STH, and his activity outside the school was reading Qur'an. Majority of the subjects (130 subjects) had poor knowledge related to life-cycle of *A.lumbricoides* before the health education. Meanwhile, a few subjects (11 subjects) had fair knowledge on *A.lumbricoides* life cycle before health education was given. The table 4.2. also shows that there was no significant difference on the level of knowledge on the life cycle of *A.lumbricoides* before the health education between the gender, level of formal education, history of STH, and activities outside school of the subjects (chi square, $p > 0.05$). On other words knowledge on *A.lumbricoides* was not associated with demographic characteristic.

Table 3. Subject's Knowledge Level on Life Cycle of *A.lumbricoides* and other Related Factors after the Health Education

| Variable | Category | Knowledge level | | | p |
|-----------------------------|---------------------|-----------------|------|------|-------|
| | | Poor | Fair | Good | |
| Gender | Male | 32 | 16 | 11 | 0.009 |
| | Female | 24 | 38 | 21 | |
| Level of education | Primary school | 42 | 26 | 10 | 0.001 |
| | Junior high school* | 14 | 23 | 18 | |
| | Senior high school* | 0 | 5 | 4 | |
| | | | | | |
| History of STH | Yes | 18 | 15 | 14 | 0.313 |
| | No | 37 | 39 | 18 | |
| Activities outside school** | Playing soccer | 15 | 5 | 5 | 0.239 |
| | Qur'an reading* | 39 | 45 | 28 | |
| | Others* | 5 | 7 | 4 | |
| | | | | | |

*for the importance of data analyzing, the data in the fair and good column are combined.

**subjects might choose more than 1 activities.

After health education, there were 32 subjects who had good knowledge, 54 subjects with fair knowledge, and 56 subjects with poor knowledge on the life cycle of *A.lumbricoides*. The subjects with good knowledge were mostly junior high school students. The subjects with fair and poor knowledge were dominated by primary school students. Most of the subjects never had STH infections. There is no significant difference on the level of knowledge on the life cycle of *A.lumbricoides* after the health education between history of STH and activities outside school of the subjects ($p > 0.05$). However, there is significant difference on the level of knowledge on the life cycle of *A.lumbricoides* after

the health education between the gender and level of formal education of the subjects (Table 3).

Table 4. The Effectiveness of Health Education in Increasing the Knowledge on the Life Cycle of *A.lumbricoides* among the Subjects

| Health education | Knowledge Level | | |
|------------------|-----------------|-----------|-------------|
| | Good | Fair | Poor |
| Before | 1 (0.7%) | 11 (7.8%) | 130 (91.6%) |
| After | 32 (22.5%) | 54 (38%) | 56 (39.4%) |

Table 4. summarizes the effectiveness of health education in increasing the knowledge on the life cycle of *A.lumbricoides* among the subjects. Over all the number of subjects who had good knowledge and fair knowledge on *A.lumbricoides*' life cycle increased by 21.54% and 30.29% respectively after the health education after the health education. On the other hand, the number of subjects who had poor knowledge decreased by 52.2% after the health education. The marginal homogeneity test confirms the significance of the improvement of knowledge on life cycle of *A.lumbricoides* by giving the result of $p < 0.001$. This shows that health education was effective in increasing the subjects' knowledge on life cycle of *A.lumbricoides*.

Discussion

Ascariasis is an infection caused by *A. lumbricoides*. Usually, the symptoms of ascariasis occurs in severe infection. For example, malnutrition; which is common in children with severe ascariasis, is debilitating because it causes growth stunt and mental retardation. Cough, dyspnea, and mild fever are other examples of clinical manifestations of ascariasis. In more severe cases where proper treatment is not given, ascariasis might result to death.⁷

Jakarta, including East Jakarta, is believed to serve an optimal condition for the growth of *A. lumbricoides*. Its land is damp and consists of clay which is the type of soil that is preferred by *A.lumbricoides*. East Jakarta has high rainfall, it reaches 243 mm in 2007.¹⁵ East Jakarta has crowded population, on July 2011 the population density reached 13,882 people/km². In addition, the flood that happens in East Jakarta also helps in carrying and spreading of *A.lumbricoides*' eggs which indirectly increase the risk of ascariasis.¹⁶

The Knowledge Level on Life Cycle of *A.lumbricoides* before Health Education

Knowledge is one of the important factors to prevent a disease. By having sufficient knowledge on a certain disease, one will try to avoid things that may precipitate the occurrence of a disease, thus decreasing the possibility to get the disease. Once a person is healthy, his or her quality of life will also increase.¹⁴ From the previous research conducted by Wijaya,¹⁷ association between knowledge and preventive behavior on STH infection on students in Pacet was found. The research showed that by having better knowledge on STH infection, aliyah students (equivalent to senior high school) were able to take preventive behavior than the tsanawiyah students (equivalent to junior high school). In order to increase the quality of life of the community, many ways might be conducted. One of them is carrying out health education on certain disease.¹⁴

Before health education, the subjects have never had any education on the life cycle of *A.lumbricoides*. Researcher also did not find any equipment (brochure, magazine, paper) that might introduce *A.lumbricoides* to the subjects at the orphanage. This may explain why only one subject had had good knowledge on the life cycle of *A.lumbricoides* before the health education.

The Effectiveness of Health Education in Improving the Knowledge on Life Cycle of *A.lumbricoides*

Health education in one of the effort to increase knowledge.¹⁴ The knowledge of a person influences the way he or she behaves on daily basis. A research which was conducted by Jukes et al¹⁸ shows that individuals with higher education levels were more protected against HIV than those with lower education level. From that research, it was known that higher education people have better understanding on how the disease transmission was; thus, they might take the necessary action to prevent from getting infected. The same result was showed in a research conducted by Amri¹⁹ on the effectiveness of education to STH prevalence in West Java. After the health education, the respondents of Amri's research took a better preventive behavior towards STH. Amri¹⁹ also mentioned that decreasing prevalence of STH was found after the health education. Therefore, the same theory might be able to be applied in this research.

Health education might be conducted in several different ways; lecture, discussion, poster, leaflet, etc. From all of those methods, lecture is

believed to be the most effective way of educating people. This might be caused by in lecture; there is two ways of communication. The subjects might ask questions to the one who gives the lecture if the subjects have not understood about the materials given. The two ways communication also increases the excitement of the subjects; thus, they give more attention to the materials given. A research conducted by Pasaribu²⁰ showed that lecture give more improvement on the knowledge on *A.lumbricoides* than a comic book did.

From the data collected in this research project, it is known that after the health education, the number of subjects with good and fair knowledge increased significantly, while the subjects with poor knowledge decreased. Several factors might contribute to the outcome of this research.

First, the lecture given was a new material to the subjects. This leads to the condition in which proper attention was given to the materials. In order to maintain the subjects' attention, 10 students from university and the orphanage's staffs helped to keep the situation optimal for learning the materials.

Second, the lecturer was a health professional who had experiences in giving lectures. Thus, the lecture was attractive. The materials given in the lecture came in interesting shapes; for examples, slides and pictures. The lecturer also taught the subjects to sing a song about how to wash hands. Thus, these methods attracted the subjects' attention.

Third, in the lecture session, there was a questions-and-answers session in which the subjects were given the opportunities to ask the lecturer if there was something that they had not understood.

Besides the previous factors, some demographic characteristics also affected the outcomes of this research. The data showed that the subjects with good knowledge after health education were mostly female. Usually, females are calmer than males. This lead to the condition in which females might gave better attention than males. According to Cook,²¹ the female students might have better understanding on the materials given. Cook²¹ proposed that there were basic differences between young male and female in school age. Female tends to have better verbal skill; such as spelling and writing skills. These differences tend to become smaller during adolescence, but the writing skills remain the same. The fact that the female subjects chose to sit at the front part while the male subjects chose to sit at the back also gave

more advantage to learn about the materials.

The data also showed that there was significant difference on the level of knowledge on the life cycle of *A.lumbricoides* after the health education between the subjects with different level of formal education. Wijaya,¹⁷ in her research mentioned that aliyah students have better understanding than the tsanawiyah students. Ng et al²² also reported that there was significant association between level of education and level of knowledge, attitude, and practice of personal hygiene. Among 345 participants of that research, the oldest group had higher personal hygiene. It reflects the result of this research. All the high school students who participated in this research had improvement of their knowledge on life cycle of *A.lumbricoides* after the health education, while not every subject who were junior high school and elementary school students showed improvement.

Conclusion

The subjects consisted of 59 males (41.5%), 83 females (58.5%); primary school (54.9%), junior high school (38.7%) and senior high school students (6.3%). Most of them never had STH infection throughout their lives. The most popular activity among the subjects beside studying are reading Qur'an (78.9%), followed by playing soccer (17.6%), and other activities such as playing video games (11.9%).

Before health education, only 1 subject had good knowledge, 11 had fair knowledge, 130 had poor knowledge. After health education, the subjects with good and fair knowledge increased to 32 and 54; the number with poor knowledge decreased to 56. Health education is effective to increase knowledge on the life cycle of *A.lumbricoides* among subjects.

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