
The Effect of Health Promotion on Helminthic Infection Among the Garbage Collectors at the Final Disposal Site of Piyungan, Bantul, Yogyakarta

Resmiaini^{1*}, Windadari Murni Hartini¹, Soeyoko², Sri Sumarni²

¹Politeknik Kesehatan Bhakti Setya, Yogyakarta, Indonesia; ²Department of Parasitology, Faculty of Medicine, Universitas Gadjah Mada, Yogyakarta, Indonesia.

Corresponding author: resmiaini@gmail.com

ABSTRACT

Introduction: Garbage collector is a group of workers with a high risk of developing helminthic infection. This is because the profession mostly related with garbage is susceptible to higher risk of exposure to worm egg. Health promotion for the use of self-protective equipments and personal hygiene is one of the ways of developing awareness among the garbage collectors to behave and act based on their knowledge. This would eventually reduce the incidence of helminthic.

Objectives: To find out the effect of health promotion for the use of Self-Protective Equipment and personal hygiene in improving knowledge, attitude, and garbage collecting practice and to get a description on the helminthic infection.

Methods: A *quasi experiment* study was conducted with *Pretest and Posttest Group Design*. Samples of the study were garbage collectors, who were selected with purposive sampling technique. The samples were divided into two groups: treatment group (25 respondents) and control group (25 respondents). Data were collected using questionnaires for knowledge, attitude, practice, and fecal samples. The data were analyzed using statistical analyses, namely, paired *t*-test and independent *t*-test with a significance level of $p=0,05$.

Results: Knowledge who received health promotion (treatment group), on the helminthic infection was better than those in the control group, who did not receive health promotion. No significant difference was found for attitude and personal hygiene practice between the treatment group and the control group. A decrease of helminthic infection was found after the health promotion in both the treatment group and the control group.

Conclusion: Health promotion can enhance the garbage collectors' knowledge on the prevention and reduce the incidence of helminthic infections.

Keywords: Health promotion, garbage collectors, helminthic infection

INTISARI

Pendahuluan: Pekerja pengangkut sampah merupakan sekelompok pekerja dengan risiko tinggi terkena infeksi cacing. Hal ini disebabkan karena profesi sebagai tenaga pembuang/pengangkut sampah sangat erat dengan bahan-bahan sisa/sampah yang biasanya banyak tercemar telur cacing. Usaha pencegahan melalui Promosi kesehatan dengan jalan menggunakan peralatan pelindung diri seperti sepatu boot, sarung tangan, masker

dan kebersihan pribadi adalah merupakan cara pencegahan yang perlu disadari dan dilakukan oleh petugas pembuang/pengangkut sampah agar terhindar dari infeksi kecacingan.

Tujuan: Untuk mengetahui pengaruh promosi kesehatan yang berupa penyuluhan tentang pengetahuan mengenai infeksi kecacingan serta cara pencegahan seperti penggunaan alat pelindung diri dan cara hidup bersih agar supaya dalam melakukan kegiatan sehari-hari dapat terlindung dari infeksi cacing.

Metode: Penelitian eksperimen kuasi dilakukan dengan pretest dan posttest Group Design. Sampel dari penelitian ini adalah pengumpul sampah, yang dipilih dengan teknik purposive sampling. Sampel dibagi menjadi dua kelompok: kelompok perlakuan (25 responden) dan kelompok kontrol (25 responden). Data dikumpulkan dengan menggunakan kuesioner untuk pengetahuan, sikap, praktek, dan sampel kotoran. Data dianalisis dengan menggunakan analisis statistik, yaitu uji-t berpasangan dan t-test independent dengan taraf signifikansi $p = 0,05$.

Hasil: Pengetahuan tentang infeksi kecacingan pada kelompok yang menerima promosi kesehatan (kelompok perlakuan), adalah lebih baik dibandingkan dengan kelompok kontrol, yang tidak menerima promosi kesehatan. Tidak ada perbedaan signifikan yang ditemukan untuk sikap dan praktek kebersihan pribadi antara kelompok perlakuan dan kelompok kontrol. Penurunan infeksi cacing ditemukan setelah promosi kesehatan pada kedua kelompok perlakuan dan kelompok kontrol.

Kesimpulan: Promosi kesehatan dapat meningkatkan pengetahuan pengumpul sampah pada pencegahan dan mengurangi kejadian infeksi cacing.

Kata kunci: Promosi kesehatan, pengumpul sampah, infeksi cacing

INTRODUCTION

Occupational Health and Safety is a system program designed for both the employees and the employers as an effort of preventing the incidence of occupational accidents and occupational diseases at workplace. The system program works by identifying things that are potential to cause occupational accidents and occupational diseases¹.

Garbage collector is a group of workers with a high risk of developing helminthic infection. The garbage collectors sort and select usable things from the piles of garbage every day. The closest risk among the garbage collectors is garbage-related infections, such cholera, diarrhea, typhus, skin infection (itching), and helminthic infection. The diseases were attributable to direct exposure with the garbage

and to the habit of disobeying personal hygiene practice².

The problem of garbage piles could not be solved only by opening new disposal site. It required active participations of the parties involved in the garbage management, including garbage collectors who are having direct contact with the garbage every day and climbing the garbage piles every day. Therefore, the garbage collectors are in high risk of developing health problems due to the direct impact of the garbage. One of the diseases attributable to the direct exposure to garbage is parasite-related diseases, such as helminthic infection³.

Worm-related infections do not generally show evident symptoms, but they may result in and contribute to the decrease in health degree when they were attributed to the symptoms such as nutritional deficiency, pneumonia,

enteric diseases, and Vitamin A deficiency. Worm-related infections are essentially harmful since they do not show evident symptoms. Consequently, the patients are not aware that they have been infected and that they suffer from a declining health degree. The decrease in health degree may lead to the decrease of productivity among the patients. The infections may even lead to death when let uncontrolled⁴.

It had been suggested that mere treatment would not decrease the rates of re-infection. The treatment must be combined with the change in knowledge, attitude, and personal health practice. A study in Paseh Subdistrict, Bandung District, West Java, concluded that soil and nail contaminated with worm eggs had been fruitful media of intestinal helminthic infection. Therefore, even though the pediatric patients were treated but no taught of a good hand-washing practice, the transmission rates of the disease would remain high⁴.

Health promotion had been a part of public health effort that puts special emphasis on community empowerment activities to maintain, to enhance, and to protect the people's health. Empowerment was provided by developing awareness, willingness, and capability in health sector as well as by creating a supporting climate for the program. In this way, the main emphasis of community empower had been behavioral development and healthy environment. The community is expected to participate actively as the actors (subjects), not to be passive as a mere object of an activity.⁶

MATERIALS AND METHODS

A quasi-experimental study was conducted using *with pretest and posttest design* that used a control group to determine the difference

between *before* and *after* the intervention⁷. The design was selected since it had been difficult for any field study in social sciences to use true experiment with randomization and truly identical subjects⁸.

Variables of the study were:

1. Independent variable, namely, health promotion with speech and demonstration methods
2. Dependent variables, namely, knowledge, attitude, and personal practice/action of the garbage collectors toward helminthic infection

Locus of the study included the following:

1. The study was conducted at the Final Disposal Site of Piyungan, located at Ngablak village, Sitimulyo, Piyungan, Bantul, Yogyakarta.
2. Measurement of helminthic infection was conducted at the Laboratory of Rajawali Citra Hospital Yogyakarta by investigating the samples of garbage collectors' feces using floating method.

Process of the Study

The study was conducted from January to June 2012. The study was conducted in the following stages:

1. Preparation Step

The first step of the study was preparing administrative procedures, permission, and preliminary learning, collecting preliminary data to the locus of the study, testing the questionnaires outside the locus of study, and counting the validity and reliability of the questions for correction and perfection of data collection⁴.

2. Implementation Step

a. Distribution of pre-test questionnaires

Before the questionnaires were distributed,

the researcher obtained informed consent from the respondents by explaining the aim and the objective of the study as well as the way of filling up the questionnaires, and getting the agreement on when the respondents had to return the questionnaires. The questionnaires were filled up before the examination for helminthic infection.

- b. Examination of the fecal samples collected from the garbage collectors at the Laboratory of Rajawali Citra Hospital, Yogyakarta
- c. The researcher was assisted by two assistants who distributed the *pre-test* questionnaires to the treatment group and the control group. The respondents were asked to answer the pre-test questions on the questionnaire sheet within the pre-determined time, namely, ± 30 minutes. All the respondents collected feces for examination of helminthic infection.
- d. After the pre-test questionnaires were collected, the next step was health promotion intervention for the treatment group. Intervention was provided in the form of short explanation on the helminthic infection from the health staff for ± 30 minutes. The next step was discussion (question-response) session that lasted for ± 15 minutes to get a feedback from the fecal examination.
- e. Post-test was conducted after the intervention. The respondents were asked to answer the post-

test questions on the questionnaire sheets that had been distributed. Fecal samples of the garbage collectors were analyzed after 3 months of the health promotion intervention given that the growth period of the worm occurred since the first time the worms were swallowed until they grew up to adult female worms and get ready to lay their egg. It lasted for 30-90 days.

The step was conducted by observing the respondents when filling up the questionnaires. The assessment was conducted by filling up the observation sheet (*checklist*).

3. Data Processing and Report Formulation Step

Data that were collected through questionnaires included data on the respondents' characteristics, knowledge on personal hygiene including the use of self-protective equipments, attitude, and personal hygiene practice. The collected data were then arranged, edited, coded, and scored. The next step was data analysis and the results were used as the material in formulating the study report.

RESULTS AND DISCUSSION

Respondent's characteristics in the study included age, gender, educational level, and the period of working as garbage collectors (tenure).

Table 1. Respondent's Characteristics

Characteristics	Treatment		Control		Statistic test	
	No	%	No	%	t	p
Age					t	p
Mean	33,68		33,20			
SD	8,67		6,97		0,216	0,83
No. Of Samples	25		25			
Gender	No	%	No	%	χ^2	p
Female	19	76	3	12	3,40	0,065
Male	6	24	22	88		
Total	25	100	25	100		
Education	No	%	No	%	χ^2	p
Primary School	17	68	12	48	0,52	0,47
Junior High School	8	32	13	52		
Total	25	100	25	100		
Tenure					t	p
Mean	8,40		8,6		0,197	0,845
SD	3,25		3,90			
No. of Samples	25		25			

Age of the respondents in the treatment group ranged from 22 to 50 years and age of the respondents in the control group ranged from 22 to 47 years. Analysis with dependent t-test revealed $p=0.83$ ($>0,05$). It means that there was no significant difference between the age of respondents in the treatment group and the control group.

There were more female respondents in the treatment group, namely, 19 respondents (76%) than male respondents were, namely, 6 respondents (24%). On the other hand, control group had more male respondents, namely 22 (88%), than female respondents, namely 3 (12%).

Most of the respondents graduated from primary school and junior high school. In the treatment group, 17 respondents (68%) were primary school graduates, while in the control

group, 13 respondents (52%) were junior high school graduates.

The respondents in the treatment group had worked as garbage collectors for 2 to 15 years. Seventeen (68%) respondents had worked as garbage collectors for 6 to 10 years compared to 12 respondents (48%) in the control group.

Fecal samples collected from the garbage collectors were taken to the laboratory of Rajawali Citra Hospital Yogyakarta. The samples were examined with floating method using NaCl. The results of fecal examination presented in Table 2 revealed that in the treatment group, most respondents (11 respondents, 44%) had hookworm infection. In the control group, 6 respondents (24%) had *Ascaris lumbricoides* infection. The study also found a double infection case (hookworm and

Trichuris trichiura infections) in 1 respondent (4%) of the treatment group, while double infection of hookworm and *Ascaris lumbricoides* was found in 2 respondents (8%) of the control group.

Table 2. Results of laboratory examination based on the types of worm

Types of worm	Treatment	Control	Statistic Test	
	No	No	χ^2	p
Uninfected	13	12		
Hookworm	11	5		
<i>Ascaris lumbricoides</i>	-	6	10,25	0,036
Hookworm + <i>T. trichiura</i>	1	-		
Hookworm + <i>A. lumbricoides</i>	-	2		
Total	25	25		

Table 3. Respondent's knowledge before and after the treatment

Variables	pretest	Post-test	Difference	t	p
Treatment	7,08	9,88	2,80	7,668	0,0001
Control	7,12	7,44	0,32	1,250	0,224

Mean pre-test knowledge of the respondents in the control group was 7,12 and 7,44 in the post-test. It means that no significant knowledge improvement was found ($t=1,248$; $p>0,05$). Difference in knowledge level was not only related to method and media factors, but also to other potential factors. Sugiharto⁹ suggested that some aspects might enhance one's knowledge, including basic capacity (intelligence), special talent, and maturity.

Table 4. Respondent's attitude before and after intervention

Variables	pretest	Post-test	Difference	t	p
Treatment	22,92	23,44	0,52	1,053	0,303
Control	23,40	22,28	-1,12	1,719	0,098

Mean attitude score in the treatment group was 22,92. It increased to 23,44 after the intervention, with $p=0,303$ ($p>0,05$). On the other hand, mean attitude score in the control group was 23,40 and mean post-test score (without intervention) was 22,28, with $p=0,098$ ($p>0,05$). It means that no significant influence (fixed) between the mean pre-test and post-test scores and no difference was found in the mean attitude score between the treatment group and the control group.

Table 5. Respondent's practice before and after intervention

Variables	Treatment			Control		
	mean	t	p	mean	t	p
Pre-test	18,92	1,77	0,88	18,36	0,901	0,376
Post-test	19,24			18,48		

Assessment of personal practice used questionnaire sheet consisting of 11 questions filled up by the respondents in the treatment group and the control group. In the treatment group, mean practice score before intervention was 18,92, with $p=0,88$ ($p>0,05$). In the control group without intervention, mean pre-test score

was 18,36 and mean post-test score was 18,48, with $p=0,376$. It means that there was no (fixed) influence on the pre-test and post-test scores. Therefore, no difference was found in the mean practice scores between the treatment group and the control group.

Table 6. Prevalence of helminthic infection in the treatment group and the control group

Variables	Pre-test		Post-test		x ²	p
	positive	%	Positive	%		
Treatment	12	48	6	24	8,55	0,003
Control	12	48	9	36	15,23	0,0001

Respondents in the treatment group received health promotion and the result of fecal examination was distributed to the respondents, while the respondents in the control group did not. Three months later, fecal examination was conducted to find helminthic infection. Post-test showed that 6 respondents (24%) in the treatment group had helminthic infection, with $p=0,003<0,05$, compared to 9 respondents (36%) in the control group, with $p=0,000<0,05$. It means that there was a significant difference between the treatment group and the control group. There might be information bias between the treatment group and the control group;

therefore, some respondents in the control group might take anti-helminthic drugs. This is evident in the post-test practice questionnaires, where respondents in both treatment group and control group had significant change from positive to negative score.

The study found that of 50 respondents, 24 respondents (48%) had helminthic infection. It shows that knowledge, attitude, and action related to helminthic infection, including the use of self-protective equipments were still relatively low among the garbage collectors at the Final Disposal Site of Piyungan, Bantul.

Knowledge on the use of self-protective equipments and personal hygiene was necessary

to make the garbage collectors aware on the helminthic infection. The garbage collectors at the Final Disposal Site of Piyungan, Bantul, Yogyakarta had inadequate knowledge on the use of self-protective equipments and personal hygiene because they had never had any training session on the use of self-protective equipments and personal hygiene from the relevant authorities or the governmental institution. This is in line with Simon-Morton¹⁰, suggesting that knowledge served as information stimulator that might be acquired from formal and informal education.

Statistic analysis using *Paired t test* in the treatment group revealed that health promotion with lecture/speech method could add the respondents' knowledge ($p=0,0001<0,05$) on the prevention of helminthic infection. On the other hand, no improvement was evident in the respondents' attitude and practice. Control group that did not receive health promotion did not show any improvement in knowledge, attitude, and practice. This is in line with Notoatmodjo¹¹, suggesting that health education among adults was generally more difficult than it was for children. This is probably because adults had developed certain knowledge, attitude, and practice for years. Health education intervention within a short period of time would only change or add knowledge in the society. This is in line with Noya¹², concluding that one-day lecture on reproductive health could add high school students' knowledge on the prevention of HIV/AIDS and sexual infectious diseases. This is because one-day lecture on reproductive health was provided in a form of two-way communication (with discussion session).

Statistic test for the treatment group revealed no significant difference. It means that health promotion for the use of self-protective

equipment and personal hygiene would not improve the garbage collectors' attitude toward helminthic infection prevention. This is evident from the fact that the respondents had low score for mean attitude. In addition, low score for the attitude of using self-protective equipments and personal hygiene was also attributable to the fact that the garbage collectors had low educational level. Most of the garbage collectors (45,22%) were primary school graduates. In this case, Buchari¹³ suggested inadequate knowledge and insight on occupational health. The workers thought that occupational diseases had been a norm. Consequently, they had slightly negative attitude toward occupational health and safety. Green¹⁴ suggested that attitude refers to a collection of belief that includes evaluative belief. Therefore, attitude must be measurable in both positive and negative ways. It means that respondents who had negative attitude toward the prevention of helminthic infection had higher risk of having the disease, compared to those with positive attitude toward the prevention of helminthic infection.

Results of practice analysis revealed that the garbage collectors had not been fully aware of the importance of using self-protective equipments and practicing personal hygiene as an effort of preventing themselves from helminthic infection. In addition, the garbage collectors frequently complained the condition and comfort in the use of self-protective equipments. Health promotion, which was provided in a periodic way and with an appropriate method, would improve the use of self-protective equipment and personal hygiene practice among the garbage collectors. In line with the finding of a study by Yusrizal¹⁵, the study also suggested a significant correlation between the practice of using complete self-protective equipment and incomplete self-protective equipment

among the garbage sweepers in Payakumbuh District. Similarly, Zahtamal¹⁶ suggested that to be successful, health promotion must be followed up by the efforts of controlling supporting factors, such as hazard control, feasibility of self-protective equipment, organizational aspect of training in occupational health and safety, and preliminary examination and periodic examination for the workers.

Decrease in the prevalence of helminthic infections among the control group was probably attributable to the probability that the respondents got information on helminthic infections from their friends, mass media, electronic media, and health facilities.

CONCLUSION

The study concludes the following points:

Health promotion can enhance knowledge on the use of self-protective equipments and personal hygiene to prevent helminthic infection among the garbage collectors at the Final Disposal Site of Piyungan, Bantul, Yogyakarta.

There is no significant difference between the attitude of using self-protective equipment and personal hygiene toward helminthic infection after the health promotion.

There is no significant difference between the practice of using self-protective equipment and personal hygiene toward helminthic infection after the health promotion. Health promotion can reduce prevalence of helminthic infection among the garbage collectors at the Final Disposal Site of Piyungan, Bantul Yogyakarta.

RECOMMENDATION

1. It is necessary to give continuous counseling to the garbage collectors on the importance of

changing their attitude toward knowledge, attitude, and personal hygiene practice.

2. Further research can use an appropriate counseling method to improve knowledge, attitude, and personal hygiene practice among the garbage collectors.
3. The garbage collectors are suggested to improve their self-hygiene and to use appropriate self-protective equipment as an early way of preventing occupational diseases and occupational accidents.

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