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The effectiveness of peer health educator interventions in improving clean and healthy living behaviours at the *Santri* of Islamic Boarding School

Puspita Sari[1], Silvia Mawarti Perdana[1], M.Ridwan[1], Muhammad Rifqi Azhary[1]

[1] Department of Public Health, Faculty of Medicine and Health Sciences, Universitas Jambi, Jambi, 36361, Indonesia

*Coressponding Authors: puspita.sari@unja.ac.id

Abstract

Background: Islamic boarding schools (*pesantren*) are traditional educational institutions in Indonesia with a high density of students (*santri*). Unhealthy habits such as eating together from a single tray, not washing hands with soap before meals, sharing bathing equipment, and even exchanging clothes increase the risk of infectious diseases including respiratory infections, diarrhea, typhoid, and scabies. Clean and Healthy Living Behavior (PHBS) is essential in pesantren to develop healthy habits and create a healthier environment. **Objective:** This study aimed to evaluate the effectiveness of the peer health educator method in improving students' knowledge and attitudes toward PHBS in Islamic boarding schools. **Methods:** A quasi-experimental study was conducted using a *two-group pretest-posttest control group design*. The total sample consisted of 120 students, with 60 in the intervention group (peer health educator) and 60 in the control group, selected purposively. Inclusion criteria were active students who could read and write and were willing to participate, while exclusion criteria included students who were ill or transferred during the study. The research instrument was a PHBS questionnaire using a Likert scale. Data were analyzed using the Wilcoxon test to assess differences in scores before and after the intervention. **Results:** The findings showed significant improvements in the intervention group, both in knowledge (p=0.006) and attitudes (p=0.003). Changes were also observed in the control group, but the effect was less significant compared to the intervention group (knowledge p=0.000; attitude p=0.009). **Conclusion:** The peer health educator method was effective in improving students' knowledge and attitudes regarding PHBS in Islamic boarding schools in Batanghari Regency. This approach is recommended as a community-based health promotion strategy in pesantren.

Keywords: Peer health educator; PHBS; Students; health promotion; Boarding

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INTRODUCTION

Islamic boarding schools are one of the oldest Islamic educational institutions in Indonesia that have an important role in shaping the character and behavior of students, including in the health aspect. The lifestyle of students who live together in a dormitory environment with a high level of density is often a risk factor for various infectious diseases such as diarrhea, upper respiratory tract infections (ARI), and skin diseases such as scabies [1]. This condition is exacerbated by the low practice of Clean and Healthy Living Behavior (PHBS) among students, such as the habit of not washing hands with soap, using toiletries together, and consuming food in the same container[2]

Nationally, the implementation of PHBS in schools and Islamic boarding schools is still not optimal. Based on data from the Ministry of Health of the Republic of Indonesia (2023), only around 62.4% of educational institutions meet the PHBS indicators, with the lowest levels in Islamic boarding schools and boarding schools[3]. In fact, healthy behavior is one of the important components in efforts to improve the degree of public health which can be prevented through effective health education. Peer-based health education interventions (*Peer Health Education*) is one of the approaches that has been proven to be effective in improving knowledge, attitudes, and health behaviors in adolescents[4]. Santri as a group of teenagers in the context of pesantren has great potential to become agents of change through this peer approach. Approach *Peer Health Educator* Allowing the transfer of health information to be carried out by fellow students with similar language, experiences, and social contexts, so that health messages become easier to accept and apply [5].

Some previous studies have shown that the *Peer Education* Effective in improving clean and healthy living behaviors in adolescents, both in the school environment and Islamic boarding schools [6]. However, most of the research is still limited to a small scale with a relatively small number of respondents and has not yet described the conditions of pesantren in rural areas such as Batanghari Regency. Therefore, this study was conducted to analyze The effectiveness of the Peer Health Educator method in improving students' knowledge and attitudes towards clean and healthy living behavior in Batanghari Regency Islamic boarding schools

METHOD

Study design and setting

This study is a quasi-experimental research with a *two-group pre-test and post-test control group design*. The study was conducted on two Islamic boarding schools in Batanghari Regency, Jambi Province, which have similar characteristics in terms of the number of students, dormitory facilities, and education system. One pesantren was designated as an experimental group that received *Peer Health Educator* intervention, while the other pesantren was a control group without intervention. The research was carried out from July to September 2025.

Population, samples, and sampling

The population in this study is all students living in Islamic boarding schools in Batanghari Regency. A total sample of 120 students consisting of 60 students in the experimental group and 60 students in the control group. The sampling technique was carried out by purposive sampling by considering the suitability of age characteristics and length of stay in the pesantren. The inclusion criteria include students who are 12-19 years old, live in a pesantren for at least six months, and are

willing to become respondents. The exclusion criteria include students who are sick or absent during the research activity.

This research involves the population of all students who live and study at Islamic boarding schools in Batanghari Regency, Jambi Province, with a total of more than 2,500 students spread across 40 active Islamic boarding schools according to data from the Ministry of Religion of Batanghari Regency in 2024 [7]. The two Islamic boarding schools were chosen purposively because they have similar characteristics in the number of students, coaching systems, and environmental health facilities. The total research sample was 120 students, consisting of 60 respondents in the experimental group and 60 respondents in the control group, which were determined using the purposive sampling, namely selection based on the suitability of characteristics with the research objectives [8].

The inclusion criteria include students aged 12–19 years, living in an Islamic boarding school for at least six months, being able to read and write, and willing to be a respondent by signing informed consent. Meanwhile, the exclusion criteria include students who are sick or absent during the implementation of interventions and data collection. The independent variables in this study are Peer Health Educator (PHE) intervention, while the dependent variable includes knowledge and attitude of students towards Clean and Healthy Living Behavior (PHBS). The determination of the sample count was based on a quasi-experimental analysis formula of two independent groups with a 95% confidence level and 80% test strength, which showed that 120 respondents had met the minimum sample size recommended for public health research [9]

Instruments and criteria

The instruments used in this study are in the form of Structured questionnaire compiled based on the guidelines Clean and Healthy Living Behavior (PHBS) from Ministry of Health of the Republic of Indonesia (2023) [10]. This questionnaire consists of two main parts, namely: (1) knowledge of PHBS which contains 15 multiple-choice questions that include indicators of personal hygiene, clean water use, environmental sanitation, and handwashing behavior with soap; and (2) attitudes towards PHBS which consists of 10 statements using a four-point Likert scale ranging from "strongly disagree" to "strongly agree".

This questionnaire is designed to measure the extent of students' understanding and positive attitude towards the implementation of PHBS in the pesantren environment. Validity of the contents (Content validityThis questionnaire has been tested by three experts in the field of health promotion and public health education from the University of Jambi. Meanwhile, the reliability of the instrument was tested on 30 respondents outside the research sample using coefficients Cronbach's alpha, with a result of 0.86 for the knowledge aspect and 0.81 for the attitude aspect, which indicates an excellent level of internal consistency[11].

Data collection and procedures

The research process is carried out through several systematic stages. Before implementation, coordination was carried out with caregivers and managers of Islamic boarding schools to determine a schedule of activities that do not interfere with students' learning activities. From each pesantren, 60 respondents were selected who met the inclusion criteria. The first Islamic boarding school was

designated as an experimental group, and the second Islamic boarding school as a control group.

Prospective *peer health educators* participated in a three-day intensive training facilitated by researchers and health workers from the Batanghari Health Center. The training materials include personal hygiene, handwashing behavior with soap, waste management, cleanliness of the dormitory environment, and behavioral-based disease prevention. The training is structured in a participatory method through lectures, group discussions, demonstrations, and role simulations.

After the training, the intervention lasted for four weeks. During this period, *peer educators* carry out weekly educational activities to other fellow students through small group discussions, educational games, and habituation of clean behavior in the dormitory. Researchers conduct field supervision every week to monitor the implementation of interventions, provide feedback, and ensure consistency of educational methods.

After four weeks of the intervention was completed, the final data collection (post-test) was carried out using the same questionnaire. Post-test activities aimed to measure changes in students' knowledge scores and attitudes in both groups (experiment and control). In addition to questionnaires, direct observation was also carried out on PHBS practices in the Islamic boarding school environment, such as room cleanliness, sanitation facilities, and the availability of handwashing facilities.

All data was collected by a team of enumerators who had been trained, with direct assistance by researchers. Data collection is carried out face-to-face by maintaining the principles of confidentiality and research ethics.

Statistical analysis

The data were analyzed using IBM SPSS Statistics software version 26. Univariate analysis was conducted to describe the characteristics of respondents. The bivariate test was conducted using the Wilcoxon Signed Rank Test to see differences in knowledge and attitude scores before and after the intervention in each group, as well as the Mann-Whitney U Test to compare differences between groups. The result is considered significant if the p value < 0.05.

Ethical considerations

This research has received ethical approval from the Health Research Ethics Commission of the Ministry of Health of the Ministry of Health of Yogyakarta with protocol number DP.04.03/e-KEPK.1/1080/2025, approval date August 21, 2025. All respondents were given an explanation of the research and signed an informed consent sheet before participating.

RESULT

Respondent characteristics

Based on Table 1, the age distribution of respondents in both groups was relatively balanced, with the majority in the range of 16–19 years (51.7% in the experimental group and 48.3% in the control group). Most of the respondents were women, both in the experimental (71.7%) and control (68.3%) groups. The history of receiving PHBS information was more from the group that had never been informed before (65.0% experiments; 68.3% controls). Of the respondents who had received information, the most sources came from health workers in the experimental group (15.0%) and from parents in the control group (10.0%). The results of the Kolmogorov-Smirnov statistical test obtained a value of significance of knowledge

and attitudes of pre-test and post-test students, less than 0.05. This means that the data is distributed abnormally. Therefore, the statistical difference test is tested using wilcoxon.

Based on Table 2, there was an increase in the average knowledge in the experimental group from 11.80 to 13.60 with a statistically significant difference (p=0.006). In the control group, there was also an increase from 11.00 to 11.70, but the increase was not as large as the intervention group (p=0.000). For the attitude variable, the average score of the experimental group increased from 39.85 to 40.95 with significance (p=0.003), while the control group increased from 39.50 to 40.75 with p=0.009. These results show that the Peer Health Educator method is effective in improving students' knowledge and attitudes about Clean and Healthy Living Behavior in the Islamic boarding school environment.

Table 1. Respondent characteristics by intervention and control groups (n = 120)

Characteristic	Experimental Group (n=60)	%	Control Group (n=60)	%
Age				
12–15 years	29	48,3	31	51,7
16–19 years old	31	51,7	29	48,3
Gender				
Man	17	28,3	19	31,7
Woman	43	71,7	41	68,3
History of Obtaining PHBS Information				
Already	21	35,0	19	31,7
Never	39	65,0	41	68,3
PHBS Information Resources				
Parents	3	5,0	6	10,0
Media	7	11,7	4	6,7
Health workers	9	15,0	4	6,7
Friend	3	5,0	4	6,7

Table 2. Effect of peer health educator intervention on knowledge and attitudes of clean and healthy living behaviors (PHBS) (n=120)

Variable	Group	Before (Mean±SD)	After (Mean±SD)	Min–Max	95% CI (Lower–Upper)	p-value
Knowledge	Experiments (n=60)	11.80 ± 4.28	13.60 ± 3.36	8–16	10,70 – 13,15	0,006
	Control (n=60)	11.00 ± 4.06	11.70 ± 3.04	8–15	10,80 – 12,90	0,000
Attitude	Experiments (n=60)	39.85 ± 9.66	40.95 ± 8.93	34–56	37,00 – 46,80	0,003
	Control (n=60)	39.50 ± 9.70	40.75 ± 9.81	31–53	37,80 – 44,20	0,009

DISCUSSION

Knowledge is a fundamental component in the pyramid of health behavior change, where before a person changes actions (behavior) he needs to first understand correct

and relevant information. The *diffusion theory of innovations* states that the adoption of innovations (including health innovations) is influenced by the community's initial knowledge of the innovation. In addition, *the KAP* (Knowledge-Attitude-Practice) model places knowledge as the initial stage that triggers changes in attitudes and practices. In the context of PHBS pesantren PHBS, increasing students' knowledge of hygiene and health aspects is the basis for them to be willing to implement daily actions such as washing hands, maintaining the cleanliness of the dormitory, and using sanitation facilities.

The results of this study showed that the average knowledge score of the experimental group increased from 11.80 to 13.60, while the control group from 11.00 to 11.70. The increase in the experimental group was greater and significant (p = 0.006) than in the control (p = 0.000). These findings are in line with the study of Sari et al. (2024) which reported that peer education and counseling interventions in Islamic boarding school students significantly increased knowledge about clean living behaviors.[12] In addition, research in high school by Dewi et al. (2022) found that peer health education programs significantly increased students' knowledge scores about personal hygiene compared to the control group.[13] This evidence supports that a peer-based educational approach can accelerate the dissemination of knowledge within the student community.

The researcher assumes that this increase in knowledge occurs because peer health educators are able to deliver material in a way that is familiar, easy to understand, and in accordance with the cultural context of the pesantren. Another assumption is that the pesantren environment supports educational interaction, and there is an intrinsic motivation of students to learn health materials. However, the assumption that all students take advantage of educational opportunities without obstacles must be kept under guard—for example, there is a possibility that some students are less present or less interested so that the impact of the intervention is not fully maximized.

Based on the results and theories above, it is recommended that the peer health educator program at the pesantren be carried out not only once, but periodically integrated into the dormitory curriculum. More in-depth training with modules tailored to the characteristics of students can strengthen knowledge understanding. In addition, educational materials should be equipped with audio-visual visual media to make them more interesting and easy to remember. For subsequent studies, it is recommended to conduct *a medium-term follow-up (3–6 months) to measure whether the additional knowledge persists and contributes to changes in PHBS practices.*

CONCLUSION

The results of this study show that the Peer Health Educator method has proven to be effective in increasing students' knowledge and attitudes towards Clean and Healthy Living Behavior (PHBS) in Islamic boarding schools in Batanghari Regency. Intervention through peer education allows for a more interactive, communicative, and contextual learning process in accordance with the life of students in the pesantren environment. This approach provides practical implications for pesantren managers and health workers to integrate peer education programs as part of a sustainable health promotion strategy in a dormitory-based education environment. In addition, this method can be an intervention model that can be applied to similar adolescent communities in other regions. Further research is recommended to

explore the effectiveness of this method against long-term behavioural change as well as its integration with digital media and community-based approaches to strengthen its educational impact.

CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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DECLARATION OF USE OF ARTIFICIAL INTELLIGENCE

This study uses the support of artificial intelligence (AI) only at the stage of improving the language and sentence of scientific manuscripts, without affecting the data analysis process or research results. AI-based language models, namely ChatGPT (OpenAI), are used to help in improving sentence structure, improving readability, and structuring academic sentences to suit international scientific writing styles. There is no process of statistical analysis, data interpretation, or conclusion drawing done using AI technology. All final analysis and interpretation results are carried out entirely by the author taking into account scientific accuracy and academic integrity. The authors assert that all AI-assisted processes have been critically reviewed to ensure the reliability, authenticity, and scientific validity of the research results.

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