KNOWLEDGE, ATTITUDE AND PRACTICE OF PERSONAL HYGIENE TO PREVENT COVID-19 AMONG THE STUDENTS IN THE ISLAMIC BOARDING SCHOOL

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Abstract. Coronavirus disease (COVID-19) is an acute respiratory infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Islamic boarding schools are one of the places at risk of COVID-19 transmission. Prevention efforts such as personal hygiene practices are necessary in order to reduce the transmission of COVID-19. This study aimed to describe the level of knowledge, attitudes, and personal hygiene practices of students in preventing COVID-19 transmission in an Islamic boarding school. This study is an analytical study with a cross-sectional approach. The population in this study was 1,884 students, and only 100 students were selected as samples through simple random sampling. Statistical analysis was performed using a chi-square test with a 95% confidence level. Results showed that 75% of respondents had a good level of knowledge, 60% of respondents had a good attitude, and 48% of respondents had proper practice. Furthermore, a half of the respondents stated that the available facilities and infrastructure, as well as rules were in the supporting category (51% and 58%, respectively). There was no relationship between the level of knowledge and attitude towards personal hygiene (p=0.157) and between knowledge and personal hygiene practices (p=0.355). There was a relationship between attitudes and personal hygiene practices (p=0.001). This study concluded that the respondents had good knowledge and attitudes toward personal hygiene to prevent COVID-19 transmission. The management of the Islamic boarding school has to monitor and improve the practices of the students to prevent COVID-19.

Keywords: COVID-19, personal hygiene, students, Islamic boarding school

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INTRODUCTION

Coronavirus Disease 2019 (COVID-19) is a contagious disease caused by the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) (Altaher *et al*, 2021). This disease was first discovered in Wuhan, China, where patients suffered from respiratory tract infections (Li *et al*, 2020). Virus transmission occurs due to close contact with an infected individual through droplets, sneezes, and aerosols (Shereen *et al*, 2020). The World Health Organization (WHO) designated COVID-19 as a Public Health Emergency of International Concern (PHEIC) on 30 January 2020. Then on 11 March 2020, the WHO declared COVID-19 as a pandemic (Sohrabi *et al*, 2020) while in Indonesia, the first cases were reported on 2 March 2020 (Djalante *et al*, 2020).

The transmission of COVID-19 still becomes a public health emergency in Indonesia. Based on a report from the Indonesian Ministry of Health on 1 March 2022, there were 24,728 additional cases making a total of 5,589,176 cases and 325 deaths in the last 24 hours (COVID-19 Response Task Force of Indonesia, 2022). The cumulative number of deaths due to COVID-19 until 2 March 2022 was as many as 148,660 (Indonesia Task Force for Handling COVID-19, 2022). The Central Java Province itself was ranked the third for having a high number of COVID-19 cases, amounting to 627,206 confirmed cases (Office of Community Empowerment, Villages, Population and Civil Registration of Central Java Province, 2022). In Banjarnegara Regency, COVID-19 infected 12,174 people, with a death toll of 674 (Local Government of Banjarnegara, 2022).

Islamic boarding schools are one of the vulnerable places for the

spread of COVID-19 since they are assembly points for students to host joint activities. If one student infected by COVID-19, it will transmitted quickly infect other students due overcrowding (Chitiyo *et al*, 2022). Students at such schools come from different areas which pose higher possibilities of mobility (coming and outgoing students). This condition poses a risk of COVID-19 infection for the school community during the pandemic.

There were 1,884 students in Islamic boarding schools where students lived in dormitories and did not return home during the learning period (Tanbihul Ghofiliin Islamic Boarding School, 2022). The Tanbihul Ghofiliin Islamic Boarding School has policy regarding COVID-19 health protocols as prevention efforts. The policy say that students are prohibited from leaving the boarding school, encouraged to wash their hands using soap or hand sanitizer, perform physical activities to increase immunity, not allowed to send and receive packages in any form, and not allowed to welcome guests to avoid direct physical contact. In addition, the Tanbihul Ghofiliin Islamic Boarding School also applied quarantine policy for students who returned from home. If the students showed a continuous decline in health during the quarantine period, the school administrator would take them to the nearest hospital for treatment. Otherwise, the students were allowed to enter the boarding school.

In response to the COVID-19 pandemic, the school also adopted the five personal hygiene measures, such as using masks, washing hands with soap and water, maintaining distance, staying away from crowds, and limiting mobilization and interaction (MOH RI, 2020a). Personal hygiene is the most basic prevention effort individuals can make to maintain health and reduce the risk of disease transmission (Handayani and Abbasiah 2020). Looking into the school's policies, this study aimed to identify knowledge, attitudes, and personal hygiene practices of students to prevent the transmission of COVID-19 at the Tanbihul Ghofiliin Islamic Boarding School, Banjarnegara.

MATERIALS AND METHODS

This study was an observational analytic study with a cross-sectional study design. The population in this study were 1,884 students of the Tanbihul Ghofiliin Islamic Boarding School. The inclusion criteria included students at the grade in junior and senior aged 14-17 years old, both male and female students, stay at Islamic boarding school at least a year, and were not on leave (active student). The sampling technique uses a simple random sampling technique (WHO, 2020b). The sample size calculation followed Lwanga and Lemeshow (1991). The formula is

$$n = (Z^2_{1-\alpha/2} P(1-P)/d^2$$

where n = sample size

Z = standard normal distribution (1.96)

α = margin of error (5%), confidence interval (95%)

P = Proportion (50%); and

d = absolute precision (10%)

Based on calculations using the above formula, the sample size was 96 respondents, and we added 4 more to make 100 respondents.

The variables studied were the level of knowledge, attitudes, and personal hygiene practices to prevent the transmission of COVID-19, the availability of facilities and infrastructure in the school, the availability of rules/regulations, and the role model of caregivers.

The data were collected through a questionnaire that had previously been tested for validity and reliability on each variable. Scores of the knowledge, attitudes and practices were categorized based on the mean or median value. Knowledge was categorized as good and poor while those of attitude and practice were good and bad, and proper and improper,

respectively. If the data distribution was normal, the mean value was used; the median value was used instead if the data distribution was not normal.

The knowledge of personal hygiene consisted of 10 questions. Each question provided two answers: 'know' and 'don't know', with the score of 'know' is one and the score of 'don't know' being 0. Maximum score that could be obtained was then 10 points. If data distribution of the knowledge score was normal, the average score was used as a cutoff point between good and poor knowledge; if not normal, then the median value was used.

The attitude of personal hygiene consisted of 11 questions. Each question provided four answers: 'strongly agree', 'agree', 'disagree', and 'strongly disagree'. For the favorable questions, the score for answering 'strongly agree' was 4; for 'agree', it was 3; for 'disagree', it was 2, and for 'strongly disagree', it was 1. The cutoff point between good and bad attitude based on data distribution; if the data distribution is normal the mean value was used, if the data distribution is not normal, then the median value was used.

The practice of personal hygiene consisted of 11 questions. Each of the questions provides four answers: 'always', 'often', 'sometimes/occasionally', and 'never'. The score of 'always' was four, the score of 'often' was three, the score of 'sometimes/occasionally' was 2, and the score of 'never' was 1. The cutoff point between proper practice and improper practice based on data distribution; if the data distribution is normal the mean value was used, if the data distribution is not normal, then the median value was used.

In addition, data on the supporting of the availability of facilities and infrastructure and the availability of regulations/rules were categorized into two categories: supporting and less supporting. There are 11 items when considering whether facilities and infrastructure were supportive or less supportive. They are: hands washing facilities, soap, clean water, bathroom, mask, hand-sanitizer, disinfectant, isolation room, cleaning equipment (broom, mop), health unit (post) of boarding school, and first aids equipment. It is categorized 'supporting' if there were ten items out

of eleven items available at the boarding school; if less than ten items, than it was 'not supporting'.

There were 10 items of the regulations/rules that the school applied for COVID-19 prevention: presence of the regulation of COVID-19 prevention, wearing mask, washing hands with soap and water, physical distancing, avoiding mass gatherings, self-quarantine after coming back from home, having a bath in the morning and in the evening, vaccination, complying with the COVID-19 prevention regulation/code of conduct, sanction for breaking the COVID-19 prevention regulation. It is categorized 'supporting' if there were ten items out of ten items available at the boarding school; if less than ten items, than it was 'not supporting'.

The chi-square test with a 95% confidence level was employed to analyze the relationship between knowledge and attitudes towards personal hygiene practice variable and the relationship between attitudes and personal hygiene practices. A *p*-value of less than 0.05 was considered statistically significant.

Ethical consideration

The Health Research Ethics Commission of the Faculty of Public Health, Diponegoro University, approved the ethics of this study with the Certificate of Ethical Approval Number 306/EA/KEPK-FKM/2022.

The research permission was obtained from the management of Islamic boarding school. We explained the aims, benefits, and risks of the research (if any) to the head of the Islamic boarding school (Islamic boarding school caretaker) and the students. The explanation also included that participation in this research was voluntary, there was no pressure, and there was no compulsion. Furthermore, informed consent forms were given to the selected students. If the students agree to participate in the research, then the students and the Islamic boarding school caretaker can consent by signing the filled informed consent form.

RESULTS

Description of respondent's characteristics

The population of the Islamic boarding school was as much as 1884 students, and the number of students who met the inclusion criteria was 1310. Then, with the random technique for the cross-sectional study resulted, 100 students were recruited. Table 1 shows that the average age of the respondents was 15.39 years; the lowest age was 14 years, and the highest age was 17 years. Respondents were mostly female (55%). The respondents included Islamic students who joined the junior school (MTs) and senior school levels. The number of respondents with an education level of Islamic middle schools (MTs) amounted to 52%, and the majority of respondents came from Banjarnegara Regency, 80%.

Respondents' knowledge, attitudes, and personal hygiene practices for COVID-19 prevention

Distribution of the knowledge score was not normal, then the median value of 7 was used as a cutoff point. A student was categorized as having a good knowledge if his/her total score was ≥7. If the total score is <7, then the student was categorized as having poor knowledge. For the attitude, the median value was 33. Therefore, a student was categorized as having a good attitude if his/her attitude score was ≥33, and having bad attitude if the score was <33. The practice scores toward personal hygiene were normally distributed, then the mean value of 32.01 was used as a cutoff point. A student was categorized as having a proper practice if his/her practice score was ≥32.01, having an improper practice when the score was <32.01.

According to Table 2, 75% of respondents had good knowledge, 60% had a good attitude, and 48% of respondents were in the proper practice of personal hygiene.

Table 1
Distribution of respondents' characteristics (N = 100)

Variable	Frequency *n* (%)
Age	
14 years	27 (27.0)
15 years	28 (28.0)
16 years	24 (24.0)
17 years	21 (21.0)
Gender	
Male	45 (45.0)
Female	55 (55.0)
Education level	
Public junior high school/Islamic middle school	52 (52.0)
Public senior high school/Islamic high school	48 (48.0)
Origin	
Banjarnegara	80 (80.0)
Outside Banjarnegara	20 (20.0)

Availability of facilities and infrastructure, and regulations following COVID-19 prevention at the Islamic Boarding School

It is categorized as 'supporting' if the school implemented more than the median value (10) or else 'less supporting' (less than 10) of the availability of facilities and infrastructure. If there were 10 regulations of COVID-19 prevention, then it was categorized as 'supporting'. At the same time, less than 10 regulations of COVID-19 prevention was classified as 'less supporting'. There were regulation-related efforts to prevent

Table 2
Distribution respondents' knowledge, attitudes, and personal hygiene practices for COVID-19 prevention (N = 100)

Variable	Frequency *n* (%)
Knowledge	
Good	75 (75.0)
Poor	25 (25.0)
Attitude	
Good	60 (60.0)
Bad	40 (40.0)
Practice	
Proper	48 (48.0)
Improper	52 (52.0)

Distribution of the knowledge score was not normal, then the median value of 7 was used as a cutoff point. A student was categorized as having a good knowledge if his/her total score was ≥7. If the total score is <7, then the student was categorized as having poor knowledge.
For the attitude, the median value was 33. Therefore, a student was categorized as having a good attitude if his/her attitude score was ≥33, and having bad attitude if the score was <33.
The practice scores toward personal hygiene were normally distributed, then the mean value of 32.01 was used as a cutoff point. A student was categorized as having a proper practice if his/her practice score was ≥32.01, having an improper practice when the score was <32.01

COVID-19 in Islamic boarding including wearing masks, washing hands, physical distancing, quarantining after leaving home, bathing, avoiding mass gatherings, conducting vaccines, and complying with the prevention of COVID-19. The availability of support of facilities and infrastructure

and the regulations at the Tanbihul Ghofiliin Islamic Boarding School to prevent COVID-19 transmission to prevent are present in Table 3.

Relationship of knowledge, attitude, and personal hygiene practices for COVID-19 prevention

The was no relationship between the knowledge and attitude, between knowledge and practice toward personal hygiene of the student to prevent COVID-19 (p=0.157 for knowledge and attitude; p=0.355 for knowledge and practice). There was a relationship between the attitude and practice of personal hygiene to prevent COVID-19 (p=0.001). The detail of the results is shown in Table 4 and Table 5.

Table 3
Availability of supports to prevent COVID-19 transmission at the Tanbihul Ghofiliin Islamic Boarding School

Variable	Frequency *n* (%)
Availability of facilities and infrastructure	
Supporting	51 (51.0)
Less supporting	49 (49.0)
Availability of regulations/rules	
Supporting	58 (58.0)
Less supporting	42 (42.0)

Note: It is categorized as 'supporting' if the school implemented more than the median value (ten items) or else 'less supporting' (less than ten items) of the availability of facilities and infrastructure. If there was the presence of the regulation of COVID-19 prevention, then it was categorized as 'supporting'. At the same time, regulation of COVID-19 prevention was absent, then it was classified as 'less supporting'.

Table 4
Relationship between knowledge and attitude towards personal hygiene for COVID-19 prevention

Variable	Attitude		*p*-value
	Good, *n* (%)	Bad, *n* (%)	
Knowledge			0.157
Good (*n* = 75)	48 (64.0)	27 (36.0)	
Poor (*n* = 25)	12 (48.0)	13 (52.0)	

For the knowledge, the median value of 7 was used as a cutoff point. A student was categorized as having a good knowledge if his/her total score was ≥7. If the total score is <7, then the student was categorized as having poor knowledge.
For the attitude, the median value was 33. Therefore, a student was categorized as having a good attitude if his/her attitude score was ≥33, and having bad attitude if the score was <33.

DISCUSSION

Knowledge

The results of this study indicated that 75% of respondents had good knowledge of personal hygiene. As the COVID-19 pandemic had occurred for more than 2 years, many mass media broadcasted information related to COVID-19, including how to prevent COVID-19. Not only mass media, such information could be obtained from health officers, television, radio, newspapers, online/internet media, social media, neighbors, family, community leaders, and religious leaders (Ali and Bhatti, 2020, Ali *et al*, 2020, Olaimat *et al*, 2020, Fan *et al*, 2020, Park *et al*, 2021, Wijesinghe *et al*, 2021, Pascawati *et al*, 2022). The results are in line with the research of Butarbutar *et al* (2021), in which as many as 60.4% of the respondents had good knowledge of personal hygiene. Personal hygiene positively affects

Table 5
Relationship between knowledge and attitude towards personal hygiene for COVID-19 prevention

Variable	Personal hygiene practice		*p*-value
	Proper, *n* (%)	Improper, *n* (%)	
Knowledge			0.355
Good (*n* = 75)	38 (50.7)	37 (49.3)	
Poor (*n* = 25)	10 (40.0)	15 (60.0)	
Attitude			0.001
Good (*n* = 60)	37 (61.7)	23 (38.3)	
Bad (*n* = 40)	11 (27.5)	29 (72.5)	

For the knowledge, the median value of 7 was used as a cutoff point. A student was categorized as having a good knowledge if his/her total score was ≥7. If the total score is <7, then the student was categorized as having poor knowledge. For the attitude, the median value was 33. Therefore, a student was categorized as having a good attitude if his/her attitude score was ≥33, and having bad attitude if the score was <33.

preventive actions (Kim and Kim, 2020). Additionally, the triggers for individuals to take action may come from internal and external factors.

Washing hands using soap and running water for 20 seconds is effective in preventing the transmission of COVID-19. Up to 98% of the respondents used soap and running water for 20 seconds. The majority of respondents already knew that hand washing was one way to prevent the transmission of COVID-19; handwashing can sweep microorganisms from hands to avoid further contact with sources of infections to other people and the environment. Previous study revealed that total colony decreased by using handwashing method is 59.5% (Nasution *et al*, 2019). Almost all respondents understood that taking shower after doing activities

could maintain their personal hygiene (96%). In line with this finding, the Indonesian Ministry of Health also released some recommendations including bathing and washing clothes after one is in contact with other people or certain objects outside the home (MOH RI, 2020a; MOH RI, 2020b; ILO, 2020).

In addition, 48% of respondents answered that they used disposable masks several times. While, according to the WHO's recommendations, masks which have been used should be disposed immediately to avoid any dangerous contact with contaminated masks (WHO, 2020a). Besides this aspect, 34% of respondents noticed that COVID-19 could transmit through droplets. Knowing this fact may enhance one's awareness to avoid touching surface of objects that potentially get contaminated by the virus.

Attitude

The results showed that 60% of respondents had a good attitude towards personal hygiene. Attitude is a belief that respondents agree or disagree with personal hygiene in preventing COVID-19. It is in line with the research by Adi and Indarjo (2022) in which male students in Islamic boarding schools had more positive attitudes towards personal hygiene (53.1%).

The respondents (74%) strongly agreed with the statement that when they coughed or sneezed, they had to cover the nose and mouth using the inside of the upper arm. The majority of respondents agreed that cough etiquette had to be applied to prevent the spread of airborne diseases or droplets. Droplets can contain infectious viruses which have the potential to be transmitted through air to other people in the vicinity of the environment (Health Agency of Padang City 2020).

Maintaining hand hygiene is one of the personal hygiene practices imposed by the WHO. As many as 72% of respondents strongly agreed

that washing hands with running water and soap was a way to prevent COVID-19. Besides handwashing, 46% of respondents agreed that another hand hygiene to do was using a hand sanitizer. They thought that they did not have to wash their hands using water and soap even though hand washing facilities were available. According to the COVID-19 Guidelines and Prevention (MOH RI, 2020a), hand hygiene is maintained primarily through handwashing, but using a hand sanitizer while hand washing facilities are not available, is also allowed. The use of hand sanitizer is less effective than hand washing to prevent the transmission of COVID-19 (Gudi *et al*, 2020).

Practice

Observed from the personal hygiene practices, 48% of respondents had proper personal hygiene practices, while 52% had improper personal hygiene practices. The respondents always washed their hands after doing activities (27%) and before doing activities (22%). One only practiced handwashing before carrying out activities if he/she notices visible dirt on the surface of the hands, and otherwise he/she will not be aware of this practice (Bin Abdulrahman *et al*, 2019).

More than half of the respondents (69%) did not re-use disposable masks. It suggested that they must comply with mask hygiene according to the recommendations of the Indonesian Ministry of Health (MoH RI 2020a; WHO, 2020a). The use of disposable masks repeatedly will endanger health (Atmojo *et al*, 2020).

Regarding body hygiene, 31% of the respondents stated that they immediately cleaned themselves or showered after doing activities outside. Wash the body using plain soap, and antibacterial and non-antibacterial products reduce bacterial effects on the skin at different concentrations (Ramli *et al*, 2020). A previous study found that cleaning/showering after

attending to patients with COVID-19, or SARS, was protective (Khatib *et al*, 2022). Thus, maintaining body hygiene is another way to clean off droplets of the body, including the virus.

In this study, some respondents admitted that they alternately used toiletries of other students (6%). Using one's personal items may increase the transmission risk of the virus (Prayitno *et al*, 2021). Previous research found that most students had low-level knowledge (71.9%), negative attitudes (51.3%), and poor behaviors (53.2%) regarding the COVID-19 prevention (Haninda *et al*, 2022).

Availability of facilities and infrastructure and regulations at the Tanbihul Ghofiliin Islamic Boarding School

The results of this study indicated that the facilities and infrastructure at the school were in the supporting category (51%). All respondents (100%) agreed that they found facilities for handwashing such as clean water and restrooms. In addition, 91% of respondents stated that the school conducted regular disinfection to prevent the transmission of COVID-19. Spraying disinfectant serves to control, prevent, and even destroy harmful microorganisms (Athena *et al*, 2020). Relevant to the current findings, research conducted by Rahmani *et al* (2021) regarding factors related to COVID-19 prevention behavior of students in Mataram City showed the school had supporting facilities and infrastructure (57.5 %).

In addition, the current results indicated that the school also provided supporting rules/regulations (58%). All respondents (100%) stated that their school required all students to get vaccines. Vaccination is considered the most effective and efficient preventive measure from the transmission of COVID-19 (Octafia, 2021). Also, 76% of respondents stated that the school applied regulations for wearing of face masks in indoor rooms as recommended by the Government. The application of

regulations about wearing of mask at the school accords with a school investigated by Agustina and Budiono (2021) who found out that policies were implemented-well at the Islamic boarding schools.

Role model of caregivers

To prevent the transmission of COVID-19 at the Tanbihul Ghofiliin Islamic Boarding School, the caregivers (teachers, administrators and principals of Islamic boarding schools) provided good examples of personal hygiene behavior, such as wearing masks in crowded areas, practicing handwashing, and explaining to students about the dangers of COVID-19. The caregivers and school administrators also participated in joint gymnastics held at the school and gave advise to students about complying with health protocols.

Relationship of knowledge, attitude, and personal hygiene practices for COVID-19 prevention

Respondents mostly had good knowledge and attitudes towards personal hygiene in preventing COVID-19 by 64% (Table 4). However, this study found no significant relationship between the level of knowledge and personal hygiene practices for preventing COVID-19 (p=0.35). This finding is not in line with Zuriyanda *et al* (2021) who found a relationship between knowledge and attitude towards personal hygiene during the COVID-19 pandemic (p=0.04).

Respondents (50.7%) had good knowledge and good personal hygiene practices to prevent COVID-19 (Table 5) even though there was no significant relationship between them (p=0.355). Similarly, Esthevyani *et al* (2021) demonstrated no relationship between knowledge and personal hygiene practices for COVID-19 prevention (p=0.782).

Moreover, most of the respondents had good attitudes and personal

hygiene practices (61.7%). There was a significant relationship between attitudes and personal hygiene practices (p=0.001). In the same way, Rachmani *et al* (2020) found a relationship between the attitude toward COVID-19 prevention and the practice of COVID-19 prevention in Depok City (p=0.0001).

In summary, respondents' knowledge and attitudes towards personal hygiene were quite good. However, knowledge was not related to attitudes when talking about personal hygiene. Besides, knowledge was not associated with personal hygiene practices. Only attitude variable had a relationship with personal hygiene practices. Referencing the research findings, students are recommended to improve personal hygiene practices to prevent the transmission of COVID-19.

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CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflicts of interest.

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