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Original Article

School health promotion: A cross-sectional study on Clean and Healthy Living Program Behavior (CHLB) among Islamic Boarding Schools in Indonesia



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ABSTRACT

Objective: This study aims to identify the knowledge, attitude, and behavior of students using eight indicators of Clean and Healthy Living Behavior (CHLB) in relation to the health education and grade levels in Islamic Boarding Schools (IBS) in Jember regency, East Java Province, Indonesia.

Methods: A cross-sectional school-based survey design was used. About 114 students (mean age of 13.17 years old) selected through a multi-stage random sampling completed a self-administered questionnaire to measure the eight indicators of CHLB, such as washing hands with running water and soap, eating healthy snacks, using clean and healthy latrines, exercising regularly and measurably, eradicating mosquito larvae, not smoking at school, weighing and height measurement every 6 months, and disposing garbage properly. The data analyses included descriptive and comparative analyses of the difference in knowledge, attitude, and behavior toward CHLB by health education and grade level.

Results: About 66.7% students received health education. Significant knowledge in CHLB in relation to health education and grade was observed ($P < .05$), including in-depth knowledge of exercises, measurable weight and height, smoking, and healthy latrines. Meanwhile, no significant difference was observed between the attitude toward CHLB and health education in different grade levels. Furthermore, CHLB was associated with health education, including habitual exercise and using of clean and healthy latrines.

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Conclusions: Knowledge, attitude, and behavior toward CHLB differ with health education and grade level. Thus, IBS can promote personal hygiene practice and environmental sanitations for the prevention of diseases in school-based environments.

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1. Introduction

The Indonesian government has launched a program of Clean and Healthy Living Behavior (CHLB) (in Indonesian, namely of program is Perilaku Hidup Bersih Sehat or PHBS) that has been implemented in Islamic boarding school (IBS) health posts (in Indonesian, Pos Kesehatan Pesantren = Poskestren) to improve people's health [1]. However, clean and healthy living behavior of children in IBS is difficult to change because of lack of knowledge, limited resources [2], and limited implementation of health education [3].

According to the National Health Research in 2013 of the Indonesian Ministry of Health, only 32.3% of the people studied achieved CHLB [4]. Furthermore, the general health conditions in boarding school environments still require attention, in terms of access to health care, healthy behavior, and health aspects of the environment. Evidence have showed that clean and healthy living behavior of children in IBS are poor, which include only the enough consumption of vegetables and fruits (10.7%), correct hand washing (47.2%), and regular exercise (52.8%) [4]. These findings indicate lower degree of CHLB in Indonesia that affects the emergence of behavioral and health problems caused by unhealthy environments.

Furthermore, evidence have shown that health problems, including intestinal worms, *diarrhea*, toothache, skin disease, malnutrition, and so forth, arise due to lack of CHLB, which in turn leads to poorer health status and quality of life [2]. Therefore, prevalent infectious diseases in Indonesia in the population aged 15–24 years consist of diarrhea (7%), malaria (1.9%), and hepatitis (1.2%) [4]. One of the causes of diseases based in IBS is improper personal hygiene and lack of knowledge in CHLB. Encouraging students in IBS is expected to have an impact on their healthy behavior, especially in the maintenance of personal hygiene and CHLB.

IBS are seen as a strategic place to promote school health; they are also an effective institution for realizing health education. In addition, school age is the golden age for instilling the values of CHLB; children are potential agents of change to better promote CHLB in the school environment, family, and society [5]. On the other hand, the complexity of the boarding school environment is very influential on the growth and health of children, thus, healthy hygienic behavior should be introduced early to pupils at school to improve their skills in healthy living. Thus, this study aimed to identify the knowledge, attitude, and behavior of students toward the 8 indicators of Clean and Healthy Living Behavior (CHLB), which differ with health education and grade levels separately in IBS in Jember regency, East Java Province, Indonesia.

2. Material and methods

2.1. Setting and design

A cross-sectional study was conducted using Islamic Boarding School-based survey in Jember regency, East Java, Indonesia to assess the health promotion of CHLB in August–September 2015.

2.2. Participants

According to data on the subdistricts of Jember regency in 2013, nine IBS are located in Jember [6]. Boarding schools were included in because IBS have implemented CHLB and have allowed the students to participate in this study with informed consent. Based on the inclusion criterion, only two Islamic boarding schools were included in this study. The estimation sample size was estimated using the proportion of about 45% of CHLB at the local district of Jember, the confidence interval used was 95% and precision was 10%. The number of samples totaled to 114 students. We used a multiple-stage sampling method to recruit students for the study. In the preliminary stage, we randomly selected a grade level and chose a class for each grade level of schools. In each school, we divided the students under the third grade level, and randomly selected each grade to select a student.

2.3. Ethical consideration

The study was approved by the University of Jember. We then obtained ethical and administrative approval from the Department of Political Unity of the Protection of the Public, District of Health Department, District of National Education, and the school administration. We interviewed and informed the classroom teachers of the students about the study, and we informed the participating students about the study and sent mails to their families, informing them about the details of the study and solicited written informed consent in case that they agreed to participate. After the families' permission was received, the data collection plan was designed.

2.4. Instruments

We used a self-administered questionnaire to collect the data. The questionnaire was adopted from the checklist of the Indonesian Ministry of Health for measuring knowledge, attitude, and behavior toward CHLB. The questionnaire assessed eight indicators, such as washing hands with running water and soap, eating healthy snacks, using clean

and healthy latrines, exercising regularly and measurably, eradicating mosquito larvae, not smoking at school, weighing and measuring height every 6 months, and disposing garbage properly, which measured the knowledge, attitude, and behavior toward CHLB were distinguished by health education and grade separately.

The questionnaire also measured the social demographic of the students, such as age, gender (boys vs. girls), access to health education/promotion (yes vs. no), and duration of health education (nothing, less, not more than 6 months). For the age of the students, we categorized them into two groups (less or more than 12 years old). Students who were less than 12 years old were included in the elementary schools (ES) groups, and those who were older than 12 were included in the junior and high schools (J/S) groups.

The students' knowledge in CHLB was measured using 14 items (yes = 1, no = 0). CHLB knowledge was categorized using the 8 indicators: washing hands with running water and soap (Q1–2), disposing garbage properly (Q3–4), eating healthy snacks (Q5–6), eradicating mosquito larvae (Q7–8), exercising regularly and measurably (Q9–10), weighing and measuring height every 6 months (Q11), not smoking at school (Q12–13), and using clean and healthy latrines (Q14). The scores for eight indicators of knowledge in CHLB were summed up to compute for a composite score, with higher scores indicating high knowledgeable ability. To ensure the adequate sample size for analysis, the students' responses were dichotomized into low- and high knowledgeable ability in CHLB measured by median for each indicator.

The students' attitude toward CHLB was assessed using 20 questions measured by a 4-point Likert-type scale (strongly disagree = 1, disagree = 2, agree = 3, strongly agree = 4). The attitude toward CHLB was categorized using the eight indicators: washing hands with running water and soap (Q1–3), disposing garbage properly (Q4–6), exercising regularly and measurably (Q7–8), eating healthy snacks (Q9–10), using clean and healthy latrines (Q11–12), eradicating mosquito larvae (Q13–14), weighing and measuring the height every 6 months (Q16–17), and not smoking at school (Q18–20), and The answers for each indicator of attitude toward CHLB were summed up to create a composite score. Higher scores indicate good attitude. To ensure the adequate sample size for analysis, the students' responses were dichotomized into bad and good attitude toward CHLB by the median for each indicators.

Behavior toward CHLB was assessed using 17 items measured by a 3-point Likert-type scale (never = 1, rarely = 2, and always = 3). Behavior toward CHLB was categorized based on eight indicators: washing hands with running water and soap (Q1–3), disposing garbage properly (Q4–5), using clean and healthy latrines (Q6–7), exercising regularly and measurably (Q8–9), not smoking at school (Q10), weighing and measuring height every 6 months (Q11–12), eating healthy snacks (Q13–14), and eradicating mosquito larvae (Q15–17). The scores for each indicator for practice of CHLB were summed up to create a composite score, with higher scores indicating healthier behavior. To ensure the adequate sample size for analysis, the students' responses were dichotomized into

unhealthy and healthy behaviors toward CHLB by the median for each indicator.

2.5. Procedure

After obtaining the consent forms, the investigators distributed the questionnaires to the eligible students. Our eligibility criteria included the following: 1) live 24 h per month in boarding schools; 2) a consent from parent or guardian and each student after explanation of purpose, risk, and benefits of the study; and 3) ability to understand and respond to survey questions. Meanwhile, the exclusion criteria included IBS, which has not implemented the CHLB program. The students answered the questionnaires inside the classrooms. Each student approximately 30 minutes to complete the questionnaire. After answering the questionnaire, the students returned the questionnaires to the research investigators. To control bias, the investigators who are nurses and are responsible for guiding the students in filling in the questionnaires.

2.6. Data analysis

The data analysis of this study employed descriptive Chi-square analysis. Chi-square χ^2 or Fisher exact test analysis was used for measuring the proportion of knowledge, attitude, and behavior toward CHLB for each indicator through the health education and grade level of the students. SPSS v22 was used for the analysis. All data analyses for the eight indicators of CHLB were conducted separately based on health education and grade level. An alpha value of P less than .05 was used to determine the statistical significance.

3. Results

Characteristic of participants show that the average age of students in boarding schools was 13.17 years, 74.6% of which were females. Among the 114 students at the school, as much as 66.7% had health education, specifically, 56.1% of the students received health education about CHLB in less than 6 months (Table 1).

Table 2 shows a significant difference between knowledge in not smoking at school and health education and grade level ($P < .05$). Among the participants, 81.6% of the students who have obtained health education and 84.2% of those in junior and senior high school grades showed high knowledgeable ability of the no smoking policy in school. In addition, a significant difference was observed among knowledge in exercising regularly and measurably, weighing and measuring height every 6 months, and using clean and sanitary latrines ($P < .05$). Among the students, the 78.9% who demonstrated high knowledgeable ability in exercising regularly, 77.6% who were highly knowledgeable in weighing and measuring the height every 6 months, 86.8% who knew about using clean and healthy latrines were in junior and senior high school.

No significant difference was observed between the attitude toward CHLB and health education of students in the grades considered in IBS with $P > .05$ (Table 3). Meanwhile, the

Table 1 – Characteristic of students in Islamic Boarding school.

Variable	n	%
Age		
Less than 12 year (elementary school)	38	33.3
More than 12 year (junior and senior high school)	76	66.7
Age (mean ± SD)	13.17 ± 1.39	
Gender		
Male	29	25.4
Female	85	74.6
Getting health education		
Yes	76	66.7
No	38	33.3
Duration health education		
No	38	33.3
Less than 6 month	64	56.1
More than 6 month	12	10.5

findings in Table 4 show that a significant difference exists between the behavior toward exercising regularly and measurably and health education ($P < .05$); 77.6% of students who received health education demonstrated healthy behavior toward exercising regularly and measurably. A significant difference was observed between the behavior toward using clean and healthy latrines and grade level ($P < .05$). Among the participants, 82.9% of students in junior and senior high school grade levels showed unhealthy behavior toward using clean and healthy latrines.

4. Discussion

4.1. Knowledge in CHLB

Based on health education for the CHLB program in IBS, students who obtained health education have high knowledge-ability in not smoking at school. These findings are consistent with a previous study conducted in Aceh, Indonesia [7]. School-based smoking prevention programs provided positive effects on health and Islamic related knowledge among adolescents in Indonesia. In addition, students in junior and higher school grades have higher knowledgeability in not smoking at school than in elementary school students. This finding might be explained by the fact that the knowledge increases and the mindset of a child grows with age and exposure to information, as confirmed by school health promotion programs [8]. Results suggest that schools can develop a health education program for improving students' knowledge in smoking.

Findings illustrated that the students belonging to higher grade levels are more knowledgeable in exercising regularly and measurably, and weighing and measuring height every 6 months, which are consistent with a previous study in China [9]. This result may be caused by the older students' desire to control their weight and to accelerate their height during puberty, although previous study have shown that adolescents are less involved in physical activities, which cause increased body mass index and fat composition during

Table 2 – Knowledge in Clean and Healthy Living Behavior with health education and grade levels.

Indicator of knowledge in CHLB	Total	Health education			Grade levels		
		Yes	No	χ^2 (P)	ES	J/S-HS	χ^2 (P)
		n (%)	n (%)		n (%)	n (%)	
Washing hands with running water and soap							
High	35 (30.7)	20 (26.3)	15 (39.5)	1.489 (.222)	13 (34.2)	22 (28.9)	0.129 (.720)
Low	79 (69.3)	56 (73.7)	23 (60.5)		25 (65.8)	54 (71.1)	
Disposing garbage properly							
High	80 (70.2)	52 (68.4)	28 (73.7)	0.131 (.717)	28 (73.7)	52 (68.4)	0.131 (.717)
Low	34 (29.8)	24 (31.6)	10 (26.3)		10 (26.3)	24 (31.6)	
Eating healthy snacks							
High	54 (47.7)	32 (42.1)	22 (57.9)	1.940 (.164)	16 (42.1)	38 (50.0)	0.356 (.551)
Low	60 (52.6)	44 (57.9)	16 (42.1)		22 (57.9)	38 (50.0)	
Eradicating mosquito larvae							
High	75 (65.8)	54 (71.1)	21 (55.3)	2.148 (.143)	20 (52.6)	55 (72.4)	3.552 (.059)
Low	39 (34.2)	22 (28.9)	17 (44.7)		18 (47.4)	21 (27.6)	
Exercising regularly and measurably							
High	80 (70.2)	58 (76.3)	22 (57.9)	3.274 (.070)	20 (52.6)	60 (78.9)	7.172 (.007)
Low	34 (29.8)	18 (23.7)	16 (42.1)		18 (47.4)	16 (21.1)	
Weighing and measuring height every 6 months							
High	79 (69.3)	56 (73.7)	23 (60.5)	1.489 (.222)	20 (52.6)	59 (77.6)	6.313 (.012)
Low	35 (30.7)	20 (26.3)	15 (39.5)		18 (47.4)	17 (22.4)	
Not smoking at school							
High	85 (74.6)	62 (81.6)	23 (60.5)	4.862 (.027)	21 (55.3)	64 (84.2)	9.817 (.002)
Low	29 (25.4)	14 (18.4)	15 (39.5)		17 (44.7)	12 (15.8)	
Using clean and healthy latrines							
High	90 (78.9)	64 (84.2)	26 (68.4)	2.909 (.088)	24 (63.2)	66 (86.8)	7.184 (.007)
Low	24 (21.1)	12 (15.8)	12 (31.6)		14 (36.8)	10 (13.2)	

Note. CLHB = Cleaning Living Health Behavior. Grade = elementary school (ES) and junior-senior high school (J/S-HS). P values determined by Chi square χ^2 or Fisher exact test.

Table 3 – Attitude toward Clean and Healthy Living Behavior with health education and grade levels.

Indicator of attitude toward CHLB	Total	Health education			Grade levels		
		Yes	No	χ^2 (P)	ES	J/S-HS	χ^2 (P)
		n (%)	n (%)		n (%)	n (%)	
Washing hands with running water and soap							
Good	73 (64.0)	48 (63.2)	25 (65.8)	0.005 (.945)	24 (63.2)	49 (64.5)	0.000 (1.000)
Bad	41 (36.0)	28 (36.8)	13 (34.2)		14 (36.8)	27 (35.5)	
Dispose of garbage properly							
Good	64 (56.1)	45 (59.2)	19 (50.0)	0.539 (.463)	20 (52.6)	44 (57.9)	0.111 (.739)
Bad	50 (43.9)	31 (40.8)	19 (50.0)		18 (47.4)	32 (42.1)	
Eating healthy snacks							
Good	77 (67.5)	48 (63.2)	29 (76.3)	1.446 (.229)	26 (68.4)	51 (67.1)	0.000 (1.000)
Bad	37 (32.5)	28 (36.8)	9 (23.7)		12 (31.6)	25 (32.9)	
Eradicating mosquito larvae							
Good	73 (64.0)	44 (57.9)	29 (76.3)	2.976 (.085)	28 (73.7)	45 (59.2)	1.719 (.190)
Bad	41 (36.0)	32 (42.1)	9 (23.7)		10 (26.3)	31 (40.8)	
Exercising regularly and measurably							
Good	66 (57.9)	44 (57.9)	22 (57.9)	0.000 (1.000)	25 (65.8)	41 (53.9)	1.012 (.314)
Bad	48 (42.1)	32 (42.1)	16 (42.1)		13 (34.2)	35 (46.1)	
Weighing and measuring height every 6 months							
Good	98 (86.0)	66 (86.8)	32 (84.2)	0.009 (.924)	32 (84.2)	66 (86.8)	0.009 (.924)
Bad	16 (14.0)	10 (13.2)	6 (15.8)		6 (15.8)	10 (13.2)	
Not smoking at school							
Good	57 (50.0)	36 (47.4)	21 (55.3)	0.355 (.551)	18 (47.4)	39 (51.3)	0.039 (.843)
Bad	57 (50.0)	40 (52.6)	17 (44.7)		20 (52.6)	37 (48.7)	
Using clean and healthy latrines							
Good	70 (61.4)	46 (60.5)	24 (63.2)	0.005 (.946)	27 (71.1)	43 (56.6)	1.670 (.196)
Bad	44 (38.6)	30 (39.5)	14 (36.8)		11 (28.9)	33 (43.4)	

Note. CLHB = Cleaning Living Health Behavior. Grade = elementary school (ES) and junior-senior high school (J/S-HS).
P values determined by Chi square χ^2 or Fisher exact test.

Table 4 – Behavior toward Clean and Healthy Living Behavior with health education and grade levels.

Indicator of behavior toward CHLB	Total	Health education			Grade levels		
		Yes	No	χ^2 (P)	ES	J/S-HS	χ^2 (P)
		n (%)	n (%)		n (%)	n (%)	
Washing hands with running water and soap							
Healthy	71 (62.3)	51 (67.1)	20 (52.6)	1.685 (.194)	21 (55.3)	50 (65.8)	0.789 (.374)
Unhealthy	43 (37.7)	25 (32.9)	18 (47.4)		17 (44.7)	26 (34.2)	
Dispose of garbage properly							
Healthy	59 (51.8)	43 (56.6)	16 (42.1)	1.585 (.208)	16 (42.1)	43 (56.6)	1.585 (.208)
Unhealthy	55 (48.2)	33 (43.4)	22 (57.9)		22 (57.9)	33 (43.4)	
Eating healthy snacks							
Healthy	69 (60.5)	49 (64.5)	20 (52.6)	1.033 (.310)	16 (42.1)	53 (69.7)	6.980 (.008)
Unhealthy	45 (39.5)	27 (35.5)	18 (47.4)		22 (57.9)	23 (30.3)	
Eradicating mosquito larvae							
Healthy	83 (72.8)	55 (72.4)	28 (73.7)	0.000 (1.000)	29 (76.3)	54 (71.1)	0.138 (.710)
Unhealthy	31 (27.2)	21 (27.6)	10 (26.3)		9 (23.7)	22 (28.9)	
Exercising regularly and measurably							
Healthy	80 (70.2)	59 (77.6)	21 (55.3)	5.053 (.035)	23 (60.5)	57 (75.0)	1.581 (1.891)
Unhealthy	34 (29.8)	17 (22.4)	17 (44.7)		15 (39.5)	19 (25.0)	
Weighing and measuring height every 6 months							
Healthy	101 (88.6)	67 (88.2)	34 (89.5)	0.000 (1.000)	31 (81.6)	70 (92.1)	1.834 (.176)
Unhealthy	13 (11.4)	9 (11.8)	4 (10.5)		7 (18.4)	6 (7.9)	
Not smoking at school							
Healthy	106 (93.0)	71 (93.4)	35 (92.1)	0.000 (1.000)	36 (94.7)	70 (92.1)	0.017 (.897)
Unhealthy	8 (7.0)	5 (6.6)	3 (7.9)		2 (5.3)	6 (7.9)	
Using clean and healthy latrines							
Healthy	27 (23.7)	17 (22.4)	10 (26.3)	0.055 (.815)	14 (36.8)	13 (17.1)	4.422 (.035)
Unhealthy	87 (76.3)	59 (77.6)	28 (73.7)		24 (63.2)	63 (82.9)	

Note. CLHB = Cleaning Living Health Behavior. Grade: elementary school (ES) and junior-senior high school (J/S-HS).
P values determined by Chi square χ^2 or Fisher exact test.

puberty period [10]. Students showed high knowledgeability in using clean and healthy latrines; such result is more prominent among junior and senior high school graders. Evidence showed that schools maintained the important role of caring for students' health, which included policy environment and stakeholder engagement, health education sessions, and practical health promotion activities [11]. These findings emphasize the important socialization of clean healthy living at an early age through the integration of learning programs in schools.

Unexpectedly, knowledge in CHLB (including washing hands with running water and soap, disposing garbage properly, eating healthy snacks, and eradicating mosquito larvae) did not differ in both health education and grades levels. These findings differ from previous studies, which showed that 85.2% of good knowledge in CHLB correlated with the knowledge in CHLB of students in Indonesia [2]. The differences in these findings may be explained by the high homogeneity and density of IBS environment, which contributed to the unhealthy lifestyle of the students. The majority of curricula used in IBS are based on religious activities and health education on CHLB is limited. These findings suggest the importance of integrating health education on CHLB in the IBS curricula to improve the knowledge in CHLB of Indonesian students based on society, culture, and religion.

4.2. Attitude toward CHLB

In this study, no difference in attitude toward CHLB was observed with health education and grade level. These findings are different from a previous study on school health program, which indicated that cognitive information, behavior skills, and affective experiences are necessary for students [12]. The difference in findings may be explained by the fact that IBS are very diverse because of the heterogeneity of life that is influenced by social, cultural, and environmental disparities. Evidence suggests that socioeconomic status is the potentially determined by environmental risk exposure [13], social disparities are determinants of health [14], and school environment is barrier to adopting hygienic behavior and thwarts health promotion efforts [15]. These findings suggest that IBS require school health promotion programs in accordance with the specific standard, culture, and religion as background to change the attitude of students in achieving the eight indicators of CHLB.

The current study found that no difference exists between all the sub variables of attitude toward CHLB and health education in different grade levels. These findings are different from previous studies, which show that a strong relationship exists between student knowledge and attitude, and healthy and clean living behavior [2,16,17]. The differences in these findings may be explained by the fact that the problems related to the life of students in IBS are very diverse because the heterogeneity of life in the boarding schools affects the incidence of diseases in a school environment. Thus, the findings suggest the importance of health-promotion strategies to prevent the unhealthy attitude of students toward CHLB.

4.3. Behavior toward CHLB

The current study discovered that students who received health education demonstrated the healthy behavior of exercising regularly and measurably. These findings are consistent with a previous study in Canada [18], which showed that school health promotion program is effective in reducing inequities in physical activity levels outside school hours, and investments in school-based health promotion leads to behavior modification beyond the school environment. In addition, the Basic Health Research in Indonesia showed that the proportion of the youth Indonesian population classified as less active was 26.1%, and sedentary activity by more than 6 hours per day was 29.1% [4]. Evidence showed that exercise is still difficult to implement among students, who become more prone to obesity [19]. Previous research shows that teachers recommended incorporating the program into the school curriculum, providing a greater variety of options to students for physical activities at school and increasing their access to sports facilities during school time [20]. These findings suggest that physical activities should be included in both intra and extra curricula in the IBS in Indonesia as a part of the CHLB program.

Another important result is that junior and senior high school students showed healthier behavior toward choosing healthy snacks than other students. These findings are consistent with a previous research, which showed that unhealthy dietary habits occur in Saudi Arabia [21], thereby confirming the inhibition of health promotion programs. Such programs must get the family and community involved for support, as confirmed by a research conducted in Ethiopia [17]; healthy behavior of students influenced their academic performance [22]. The findings suggest that eating healthy snacks as part of the dietary habits of students can be promoted in school through the regulation of school catering and cafeteria services.

The findings illustrated that students in junior and senior high school grades have unhealthy behavior toward the use of clean and healthy latrines. These findings differ from a previous study in Kenya [23]. The difference in findings might be explained by the fact that the environmental health problems associated with the provision of latrines in IBS are due to the lack of economic power of families in the development of healthy latrines, which was confirmed by a previous study on socioeconomic disparities in health behaviors [24]. However, the patterns of behavior of students in using latrines can be taught by parents at home or through health education by teachers in schools because schoolchildren are potential agents of change in health [23].

The findings on the behavior toward CHLB based on the eight indicators of CHLB showed that only three indicators (eating healthy snacks, exercising regularly and measurably, and using clean and healthy latrines) differed with health education among students in various grade levels. However, the other five indicators of CHLB (including washing hands with running water and soap, proper disposal of garbage, eradicating mosquito larvae, weighing and measuring height every 6 months, and not smoking at school) did not differ from health education and grade levels. This finding illustrated the

lowest value for CHLB on students in Indonesia, as confirmed by only 32.3% of CHLB with good achievement based a national Indonesian survey [4]. These results may have been caused by the mode of teaching CHLB in different schools; however, the practice of CHLB on a daily basis is not monitored and supervised continuously in IBS or at home. Therefore, this condition suggests the importance of getting parents or guardians involved in coaching the students to include CHLB in their daily activities.

Health education in IBS in Indonesia has a positive effect on knowledge and behavior toward CHLB, especially for the following indicators: smoking, exercise, measure of weight and height, eating healthy snacks, and use of clean and healthy latrine; results were confirmed on junior and senior school graders. These findings are consistent with those obtained in previous studies in Denmark [25] and Ecuador [26]. Therefore, CHLB in IBS should be incorporated into the programs of the school curriculum to support the achievement of healthy living in schools.

The limitations of this study are the cross-sectional case study design and interpretation of the study results, which are restricted to associations rather than causal conclusions. The difference in knowledge and behavior toward CHLB with health education and grade level identified in this study is only temporary. Thus, different results may be acquired if another study is conducted on the eight indicators of CHLB in relation to knowledge, attitude, and behavior of students. Another limitation includes the samples size because the informed consent covered only 2 IBS based on the criteria of the study.

5. Conclusions

The current study determined that knowledge and behavior toward CHLB differed with health education and grade level among IBS students, but no difference was observed with the attitude toward CHLB. The differences in knowledge and attitude toward CHLB commonly included indicators, such as smoking, exercise, measure of weight and height, choice of healthy snacks, and use of clean and healthy latrine. Study results suggest that CHLB is the foundation of health behaviors that can be achieved by students at boarding schools. Therefore, IBS should be promoted in school health programs associated with personal hygiene and environmental sanitations of schools to prevent diseases in school-based environments. Future study should evaluate the health education of CHLB to promote students' independence in practicing basic health exercises through intra and extra-curricular activities and according to the charge integration of the school health curriculum in Indonesia.

Authors contribution

SUSANTO leader of research program, data analyzes, manuscript prepared. SULISTYORINI collecting data, implementation of program. WURYANINGSIH literature searching, writing final result of research report. BAHTIAR lobbying and local

policy in Islamic Boarding School, develop the instrument for collecting data.

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Declaration of conflicting interests

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