

Improvement of Students and Snack Vendors Behavior After Received Health Promotion Program from UKS's Cadres

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ABSTRACT

Background: School Health Program or UKS aims to improve students learning achievement by improving their health status including the fulfillment of nutrition so that they can grow and develop optimally. The nutritional problems of school-age children in Indonesia, according to Riskesdas 2018 data, are children with the short/stunting category reaching 30.7%, while those who are obese are 8% and anemic 26%. Nutritional problems in school children will affect the quality of human resources in the future.

Objectives: This study examined the effect of promoting healthy and safe snacks by UKS's cadres on increasing knowledge, attitudes, behavior of students and snack sellers.

Materials and Methods: The first stage of research was training elementary school students UKS's cadres who will become educators on promoting healthy and safe food consumption behavior. The second stage was assessed to 360 randomly selected students and 94 school vendors in 12 different schools. The intervention schools received a package of promotions delivered by UKS's cadres while the comparison group received the poster. Data on knowledge, attitudes, behavior of students and food sellers were collected using a questionnaire instrument. The data were collected by the researchers assisted by 12 enumerators, 6 research field assistants and 12 teachers in charge of the research field. Bivariate analysis using t-test, Wilcoxon test, and Mann Whitney test were used to assess the differences between the groups.

Results: After intervention by UKS's cadres, there was a change in students' knowledge of 51.1% for knowledge of healthy snacks, 52.8% about safe snacks, 82.8% about formalin, 62.8% about borax, and 75.6% about Rhodamine B. Changes in the behavior of snack sellers, the highest percentage of changes in holding food with tools is 62.5% and not holding food after holding money is 54.2%. Increased change were significantly higher in the intervention groups than the comparison group ($p < 0.05$).

Conclusion: The UKS's cadres as trained peer-educators could significantly improve safe and healthy food behavior of students as well as knowledge of snack school vendors. UKS's cadres as promoters of healthy and safe snacks can be used as a mandatory UKS program in school to achieve food safety for school children

Keywords: School health program; elementary school; trained students; street vendors; food safety; peer educators

BACKGROUND

The nutritional problems of school-age children in Indonesia, according to Riskesdas 2018 data, are children with the short/stunting category reaching 30.7%, while those who are obese are 8% and anemic 26%. Nutritional problems in school children will affect the quality of human resources in the future [1]. Quality human resources in the school environment can be realized by providing food that will be consumed by the school community in safe, quality, and nutritious conditions. The food consumed by the school community can be in the form of snack food available in the school environment or snack food outside the school environment. The food currently circulating, including food sold in school canteens and/or in the school environment, is food produced by the food industry, including the food home industry and food produced by catering services which are called ready-to-eat food. The safety and quality of food products circulating in the

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school environment are determined by school policies, the level of knowledge and concern of school canteen managers and food vendors around the school environment [2].

Law No. 36 of 2009 concerning health has mandated efforts to improve nutrition to improve the nutritional quality of individuals and communities. Fulfilling the nutritional adequacy of children can be through breakfast and snacks for children who have not had breakfast. In 2017 there were 53 extraordinary incidents of food poisoning reported by BPOM throughout Indonesia. The use of hazardous food additives (BTP) that is often used is the use of preservatives, dyes, and sweeteners [3].

The provision of energy and other nutrients for school-aged children is partially supplied by snacks. Snack consumption, and is beneficial for the growth of children [4]–[8]. The family environment exercises a strong influence on the child's diet. On reaching school-age, however, the child's diet may change because of the increased time spent by children in school and away from parental supervision. Many children acquire new habits of 'what to eat' and 'how to eat' from outside the home [9]–[12].

Among all age groups and social classes, including school-age children and adolescents, snacking is part of daily life [13], [14]. Many school-age children buy snacks in accordance with their preferences, without any knowledge or understanding of the ingredients contained in the snacks, which may adversely affect their health [15]–[18]. Many snacks still sold in schools have not met the basic health requirements, such as hygiene and use of harmful chemical additives, increasing the risk for students to consume unhealthy snacks [19].

The Food & Drug Control National Agency (BPOM) has found many cases from the research on street food snacks for school children. But ironically, until now there are still many dangerous school snacks sold in the school environment. These unhealthy snacks contain at least one or more the harmful substances, namely formalin, borax, rhodamine B, and methanyl yellow. All four are carcinogenic or trigger cancer. Borax and formalin are commonly used as preservatives, while Rhodamine B and methanyl yellow are used as dyes. Napitupulu and Abadi, 2018 examined roasted meatballs sold by vendors in several elementary schools in Medan and found that three samples of roasted meatballs contained Borax and four samples of sauces on roasted meatballs that were examined contained Rhodamine B [20]. These problems indicated the low level of awareness concerning the food safety of the community, including both sellers and buyers.

School health programmes are an important component of public health. Children spend more time at school than anywhere else, except at home. Schools can play a significant role in influencing school-age children by, teaching them, for instance, healthy behaviours for children. Without education, children are not prepared to get the correct information, proper knowledge, and skills about nutrition. Some studies have showed that a peer-based model of nutritional education has a positive impact on students' nutritional behaviour. Peers can positively influence students' knowledge, awareness and self-reliance [14], [21]–[23]. A study on the efficacy of training students as peer educators to provide information on healthy and safe consumption behaviour in schools is necessary. We aimed to assess the changes in knowledge, attitude and behaviour of UKS's cadres after being trained; students' knowledge, attitudes and behaviour during the intervention and compare it after the student group had received the promotion from UKS's cadres and snack vendors' knowledge during the intervention and compare it after the group had received the promotion from UKS's cadres.

MATERIALS AND METHODS

The quasi-experimental approach using a pre–post-test control group was assigned in this study. The study conducted in Deli Serdang District, Sumatera Utara Province, Indonesia. The selection of research locations in Deli Serdang Regency was carried out purposively. Researchers chose two sub-districts based on geographical location and based on the number of primary schools that were most abundant in the sub-district. The selected sub-districts are Pantai Labu District representing the coastal area and Tanjung Morawa. District representing the mainland area based on purposive. The selection of schools in the district was also chosen purposively, namely schools that had UKS activities and many food vendors around the school.

Researchers set six primary schools as controls and six primary schools as intervention sites for UKS's cadres selected in each sub-district of Pantai Labuh and sub-district of Tanjung Morawa so that the total number of primary schools used as research locations was 12 elementary schools. Pantai Labu sub-district, three primary schools were selected as intervention and three primary schools as controls. In the Tanjung Morawa sub-district, three primary schools were intervention and three primary schools were controls. The selection of schools in the district was also chosen purposively.

The population in this study was all 3rd grade, 4th grade, 5th-grade elementary school students, and all school children snack sellers in the school environment. The population in this study was to assess the effect of giving promotions by trained UKS's cadres to elementary school students in the intervention group and the effect of pasting posters on the control group. Using a level of significance of 5%, and a test power of 90%, we anticipated the proportion of the population in the twelve selected schools to be 0.44 (P1) and 0.25 (P2) while the drop-out rate to be 30%. We enrolled 360 students in two groups. The sample of students in the intervention group of UKS's cadres was 180 and the sample in the control was 180. The sample selection was carried out by systematic sampling for the student sample by considering the number of students in each class. Sample for snack sellers, all snack sellers around the school were used as respondents in this study (48 for intervention and 46 for control).

Data analysis was carried out univariate and bivariate. Univariate analysis was conducted to determine the frequency distribution of the data. Bivariate analysis to analyze the effect of treatment on the intervention group by UKS's cadres and the control group. Before the bivariate analysis was carried out, the data normality test was carried out using the Kolmogorov Smirnov test. In this study, all data were not normally distributed, so the Wilcoxon statistical test and the Mann-Whitney test were carried out to analyze the effect of treatment between groups. The paired-sample t-test statistical test was used to analyze the effect of UKS's cadre training on the knowledge, attitudes, and behavior of UKS's cadres because after the normality test the data with Kolmogorov-Smirnov showed a normal data distribution ($p > 0.05$).

Study instrument

We assessed the knowledge, attitudes and behaviours of the students using structured questionnaires. We asked questions relating to 22 items of knowledge, 15 items of attitude and 15 items of behaviour to identify the students' understanding concerning the healthy snacks, potential bacteria, chemical and physical hazards in snacks, characteristics of foods containing chemical hazards, as well as the impact of the consumption of contaminated food on health. We also asked the vendors questions concerning 24 items of knowledge using structured questionnaires while we observed their behaviours using a structured check list. We kept the sentence structure and format of the questionnaires for an easier understanding. An expert panel of nutritionists determined the validity of the content while we used a group of students ($n = 30$) and a group of vendors ($n = 10$) to assess the content validity prior to data collection. We tested the internal consistency (Cronbach's alpha) for the students' knowledge, attitude and behaviour sections, with results of 0.666, 0.654 and 0.632, respectively. Cronbach's alpha for the snacks vendors' knowledge question was 0.714.

We scored each positive or correct response to the students and vendors questionnaires as 1 point. The maximum score obtained for a student's knowledge was 22, that for a student's attitude was 15, and that for a student's behaviour was 15. The maximum score for a snacks vendor's knowledge was 24. We evaluated the differences in the scores for knowledge, attitude and behaviour of students before and after intervention, as well as between intervention and comparison groups using the Mann Whitney test with a significance level of 5%.

Data Collection

The data was collected by 12 enumerators, namely nutrition students from the Health Polytechnic of the Medan Ministry of Health who have passed the food safety and nutritional status assessment courses. This data collection was also accompanied by researchers and 6 field research officers. The field officers are three nutrition laboratory officers from the Health Ministry of Health Medan and three nutrition workers at the *puskesmas* or community health center. In addition to researchers and field assistants, this data collection was also accompanied by one teacher from each school who became the research locus as the person in charge of the field. Data were collected using questionnaire instruments and observation sheets.

Intervention

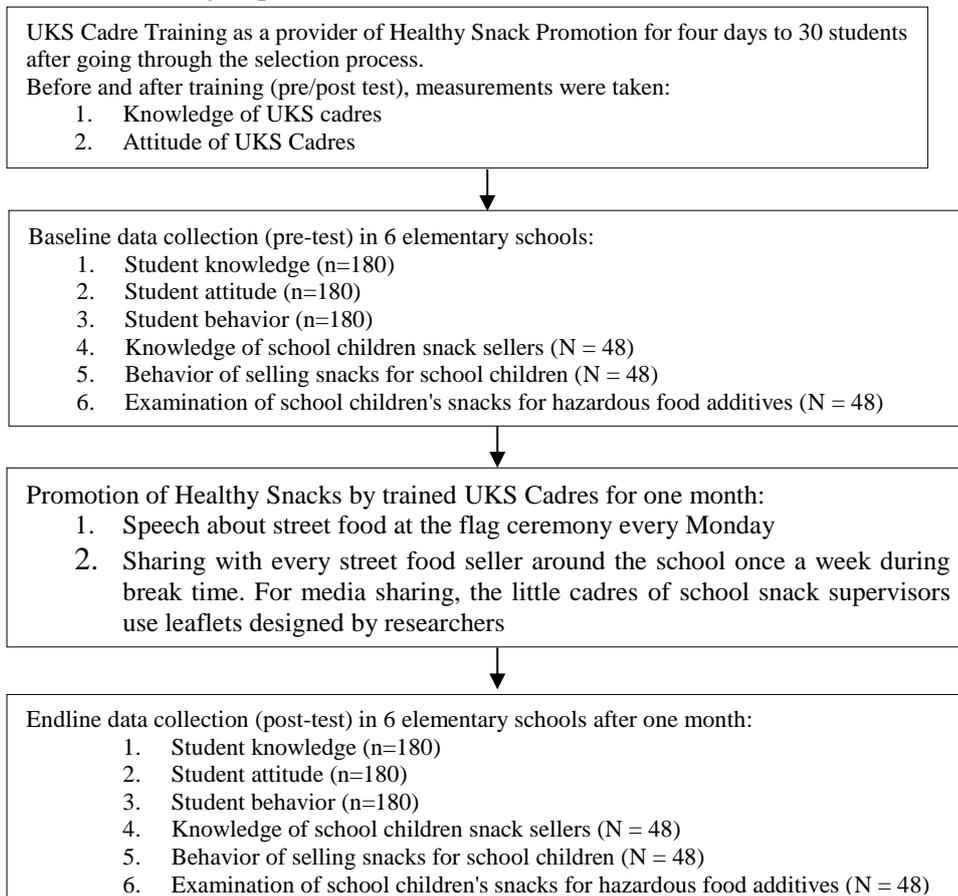
The initial phase of the research involved the training of the students as UKS's cadres, to act as educators in the selected schools. We selected and trained five students from each of 12 different elementary schools located in selected districts using the inclusion criteria of students in grades 3, 4 and 5, academically ranked from 1st to 5th in their class, and with good public speaking skills. The cadres were trained for four days, after which they were recruited based on the results of the test. For the first day, we provided training material involving snacks that contain chemicals harmful to human health. The material for the second day included

promotion methods to the vendor (speech). In the third day, we trained the students on the borax, formalin and rhodamine B assessments while in the fourth day, we focused on speech and sharing information practices.

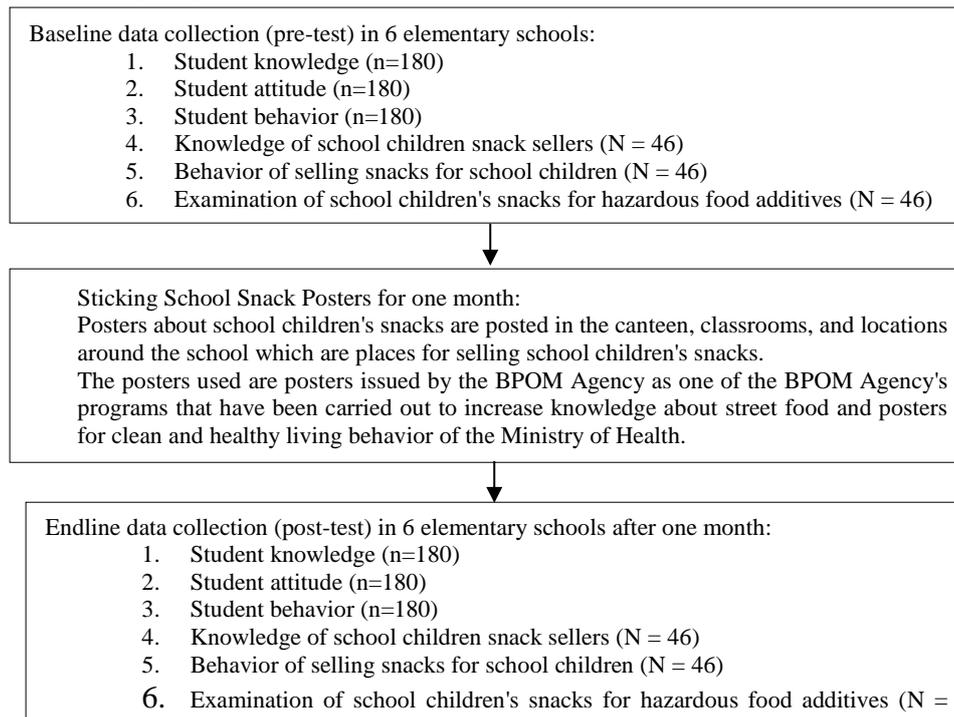
In the second phase of our research, we assessed 360 randomly selected students and 94 school vendors in 12 different schools. We performed this phase after the intervention of the UKS's cadres every Monday and the sharing of information with street food vendors once a week for one month. We provided the intervention schools with packaged activities, such as a speech to peers, interpersonal communication with snack vendors and poster distribution. We displayed posters promoting the consumption of healthy and safe snacks, developed by the National Agency of Food and Drug Control (BPOM) in comparison schools. The posters distributed to both groups included information about healthy snacks, potential bacteria, chemical and physical hazards in snacks, characteristics of foods containing chemical hazards, as well as the impact of the consumption of contaminated food on health. Prior to the intervention activities, we conducted a baseline survey to assess the knowledge, attitudes and behaviours of students, the knowledge of snacks vendors and an assessment of the foods potentially containing dangerous additives, such as formalin, borax and rhodamine B. Then, the UKS's cadres and laboratory research staff subjected the foods suspected of contamination with harmful additives to laboratory tests using touch formalin tests, touch borax tests and touch rhodamine B tests.

Research Scheme

Treatment in the intervention group



Comparison group



We obtained permission and administrative approvals from the Education Office of Deli Serdang District to conduct this study. The ethical clearance was obtained from the Nursing Faculty of the University Sumatera Utara, with number: 1206/V/SP/2018. We informed all respondents about the purpose of the study and obtained their consent prior to data collection.

RESULTS

This research was started by training UKS students as a provider of snack promotions to students and snack sellers for school children. To assess the success of the training, researchers measured the knowledge, attitudes, and behaviour of students about school children's snacks, with the following results:

Table 1. Change In Knowledge, Attitudes and Behaviour Scores of UKS's Cadres Before and After Training (N = 30)

| Variables | Average ± SD | Average change ± SD | <i>p value</i> * |
|---------------------------|-----------------|------------------------|------------------|
| knowledge before training | 12.77 ± 3.58 | | |
| knowledge after training | 19.77 ± 2.11 | 7.00 ± 2.98 | 0.001 |
| attitude before training | 8.20 ± 2.16 | | |
| attitude after training | 13.37 ± 1.88 | 5.17 ± 1.91 | 0.001 |
| behaviour before training | 7.93 ± 1.89 | | |
| behaviour after training | 13.0 ± 1.88 | 5.07 ± 1.64 | 0.001 |

*difference within the group (before and after) using paired t-test, at significant level of 5%

Table 1 summarises the scores for knowledge, attitude and behaviour. An increase of these scores, with significant average differences of 7.00 ± 2.98 , 5.17 ± 1.91 and 5.07 ± 1.64 , respectively can be observed. After being analyzed with the paired t-test statistical test, it showed that there were differences in the mean knowledge, attitudes, and behavior of UKS cadres before and after the training. UKS cadre training as a promotion provider for school children snacks affects increasing the knowledge, attitudes, and behavior of UKS's cadres.

The effect of intervention to student and snack school vendors

The method of promoting healthy and safe snacks for school children carried out by trained UKS cadres is a speech every Monday during the flag ceremony and sharing with school children snack sellers. Respondents in this study were all students in grades 3, 4, and 5 from each school that became the research location which was randomly selected, and all street vendors selling snacks for school children around the school. The characteristics of the respondents can be seen in table 2 and table 3 below.

Table 2. Characteristics of Student Respondents

| Variabels | Control | | Intervention | |
|--------------|---------|------|--------------|------|
| | n | % | n | % |
| Age | | | | |
| 8 - 9 | 57 | 31.7 | 52 | 28.9 |
| 10 - 11 | 115 | 63.9 | 120 | 66.7 |
| 12 - 13 | 8 | 4.4 | 8 | 4.4 |
| Kelas | | | | |
| Grade 3 | 60 | 33.3 | 62 | 34.4 |
| Grade 4 | 61 | 33.9 | 66 | 36.7 |
| Grade 5 | 59 | 32.8 | 52 | 28.9 |
| Total | 180 | 100 | 180 | 100 |

Table 3 Characteristics of Snack Sellers Around School

| Variabels | Control | | Intervention | |
|----------------------|---------|-------|--------------|-------|
| | n | % | n | % |
| Age | | | | |
| 25 - 35 | 9 | 19.57 | 11 | 22.92 |
| 36 - 46 | 19 | 41.30 | 17 | 35.42 |
| 47 - 57 | 13 | 28.26 | 16 | 33.33 |
| 57 - 70 | 5 | 10.87 | 4 | 8.33 |
| Jenis Kelamin | | | | |
| Male | 17 | 36.96 | 21 | 43.75 |
| Female | 29 | 63.04 | 27 | 56.25 |
| Total | 46 | 100 | 48 | 100 |

Table 4. Knowledge, Attitude and Behaviour Scores Before and After the Interventions

| Variables | Comparison (N1 = 180) (N2 = 46)* | Intervention (N1 = 180) (N2 = 48)* | p value ^{b)} between groups |
|------------------------------------|--|--|---|
| Student's knowledge | | | |
| before | 12.00 (10.00–16.00) | 12.00 (9.00–15.00) | 0.096 |
| after | 13.00 (11.00–16.00) | 19.00 (16.00–21.00) | 0.001 |
| change | 1.00 (0–1.00) | 6.00 (4.00–9.00) | 0.001 |
| p value ^{a)} within group | 0.001 ^{a)} | 0.001 ^{a)} | |
| Student's attitude | | | |
| before | 8.00 (7.00–10.00) | 8.00 (7.00–10.00) | 0.758 |
| after | 9.00 (8.00–11.00) | 13.00 (11.00–14.00) | 0.001 |
| change | 1.00 (0–3.00) | 4.00 (2.00–6.00) | 0.001 |
| p value ^{a)} within group | 0.001 ^{a)} | 0.001 ^{a)} | |
| Student's behaviour | | | |
| before | 7.00 (7.00–10.00) | 7.00 (6.00–9.00) | 0.287 |
| after | 9.00 (7.00–11.00) | 12.00 (10.00–14.00) | 0.001 |
| change | 2.00 (0–3.00) | 4.00 (2.00–5.00) | 0.001 |
| p value ^{a)} within group | 0.001 ^{a)} | 0.001 ^{a)} | |
| Vendor's knowledge | | | |
| before | 17.00 (13.75–19.00) | 17.00 (14.25–18.75) | 0.854 |
| after | 16.50 (14.00–19.00) | 21.00 (19.00–22.00) | 0.001 |
| change | 0.50 (0–2.00) | 4.00 (2.00–5.75) | 0.001 |
| p value ^{a)} within group | 0.042 ^{a)} | 0.001 ^{a)} | |

^{a)} difference within groups (before and after) using Wilcoxon test, at significance level of 5%

^{b)} difference between groups (intervention and comparison) using Mann Whitney test, at significant level of 5%

¹⁾ expressed as average (25th–75th percentile)

* N1: number of students

N2: number of snacks vendors

Table 4 shows that the condition of both groups of students and vendors in the baseline were similar in term of knowledge, attitude and behaviour. However, after the given intervention, there was an increase

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change in the score of knowledge, attitudes and behaviour of students as well as vendor's knowledge. It is seen that the increase in the intervention groups were significantly higher than that for the comparison group. The average values of knowledge, attitude and behaviour of students before and after intervention showed significant differences ($p < 0.05$).

It can be seen in Table 5 that the increasing percentage of students who gained knowledge is the highest for the topic 'characteristics, form and function of formalin' (43.9%) and the lowest for the topic 'healthy snack' (17.8%).

Table 5. Student's Knowledge About the Specific Topics Related on Healthy and Safe Snacks Before and After the Interventions

| Topics | Comparison (N=180) | | | | Intervention (N = 180) | | | | Difference ^{a)} | |
|--|--------------------|------|-------|------|------------------------|------|-------|------|--------------------------|------|
| | Before | | After | | Before | | After | | n | % |
| | n | % | n | % | n | % | n | % | | |
| 1. Healthy snack change ^{a)} | 92 | 51.1 | 152 | 84.4 | 88 | 48.9 | 180 | 100 | 32 | 17.8 |
| 2. Snack safety (bacteria, chemical, and physical) change ^{a)} | 70 | 38.9 | 122 | 67.8 | 82 | 45.6 | 177 | 98.3 | 43 | 23.9 |
| 3. The characteristics, form, and function of formalin change ^{a)} | 18 | 10.0 | 88 | 48.9 | 14 | 07.8 | 163 | 90.6 | 79 | 43.9 |
| 4. The characteristics, form, and function of borax change ^{a)} | 24 | 13.3 | 79 | 43.9 | 21 | 11.7 | 134 | 74.4 | 58 | 32.2 |
| 5. The characteristics, form, and function of rhodamine B change ^{a)} | 22 | 12.3 | 86 | 47.8 | 25 | 23.9 | 161 | 89.4 | 72 | 40 |

^{a)} change within groups

^{b)} change between groups

Table 6. Behaviour of Snack Vendors Based on Cadres' Observations

| Behaviour | Comparison (N=46) | | | | Intervention (N = 48) | | | | Differences ^{b)} | |
|--|-------------------|------|-------|------|-----------------------|------|-------|------|---------------------------|------|
| | before | | After | | before | | after | | N | % |
| | N | % | N | % | N | % | N | % | | |
| 1. Holding food without tools change ^{a)} | 46 | 100 | 46 | 100 | 48 | 100 | 18 | 37.5 | 3 | 31.9 |
| 2. Holding snacks after holding money change ^{a)} | 46 | 100 | 46 | 100 | 48 | 100 | 22 | 60.4 | 2 | 27.7 |
| 3. Long nails, dirty clothes change ^{a)} | 30 | 65.2 | 21 | 45.7 | 31 | 64.6 | 10 | 20.8 | 1 | 12.7 |
| 4. Dirty tools change ^{a)} | 35 | 76.1 | 32 | 69.6 | 36 | 75 | 19 | 39.6 | 1 | 14.9 |
| 5. Opened snacks change ^{a)} | 39 | 84.8 | 35 | 76.1 | 37 | 77.1 | 6 | 12.5 | 2 | 28.7 |
| 6. Waste disposal unavailable change ^{a)} | 44 | 95.7 | 43 | 93.5 | 41 | 85.4 | 2 | 4.2 | 3 | 40.4 |

^{a)} change within groups

^{b)} change between groups

Table 6 shows the behaviour of snack vendors based on cadres' observations. The lowest percentage of change belongs to vendors' behaviour in the topic of personal hygiene, such as long nails and dirty clothes (12.7%). Snack vendors find it difficult to change their behavior in terms of personal hygiene, especially cleanliness of nails and cleanliness of clothes used when selling.

Table 7 summarises the results of the vendor inspections conducted by cadres and supervised by laboratory workers. It was found that both the control and the intervention groups used unsafe food ingredients.

Table 7. Snacks Containing Harmful Chemical Additives Before and After the Interventions

| Comparison (N=6) | | | | Intervention (N=6) | | | |
|------------------------------|------------|-----------------|----------------|--------------------------------|----------------|--------------------|-----------------------|
| Location | Snacks | before contains | after contains | Location | Snacks | before contains | after contains |
| SD A, public school | noodles | formalin | formalin | SD I.1, Islamic private school | rice cake | borax | - |
| SD B, Islamic private school | nugget | borax | borax | SD I.2, public school | chicken nugget | borax, rhodamine B | food not sold anymore |
| SD C, public school | meat ball | borax | borax | SD I.2, private school | jam | rhodamine B | food not sold anymore |
| SD D, private school | noodles | formalin | formalin | SD I.3, public school | noodles | formalin | formalin |
| SD E, public school | ice candle | rhodamine B | rhodamine B | SD I.4, public school | ice candle | rhodamine B | - |

DISCUSSION

Our study shows that prior to the intervention, most of the students had poor knowledge about healthy and safe snacks, as reflected in the score before intervention. In the comparison group, we considered the average score of knowledge to be low even after the intervention. In general, respondents were ignorant about the harmful ingredients found in snacks. Neither students nor snack vendors knew the characteristics of snacks that may contain formalin, borax and rhodamine B, nor their impact on human health. This lack of knowledge is reflected in the low scores of the respondents in terms of attitudes and behaviour. Because the information about safe and healthy snacks is not yet available in the school curriculum, it is very difficult for students to get the correct information about healthy and safe snacks for school children, with severely limited access for students. The only source of information for students is often their parents while every day at school, the children are exposed to various types of snacks without any form of supervision regarding food quality and safety.

We found that vendors were aware of the need for students to consume safe and healthy snacks. However, our research showed that the vendors mostly had poor practices and sold unsafe and unhealthy snacks to school children. We also noted their poor personal hygiene, such as not using tools when holding snacks, not washing hands after holding money and leaving the snacks they sold uncovered and consequently, in contact with flies. The results of the chemical tests showed that some snacks contained harmful chemical additives.

After the intervention, we observed an increase in the average scores for knowledge, attitudes and behaviour of students and vendors, both in the intervention and the comparison groups. This increase in mean score was evident in the group given interventions which received a combination of poster distribution and promotion activities implemented by UKS's cadres ($p < 0.05$). Posters and promotions conducted by school health programme cadres provided a stimulus in the form of healthy and safe vendor's information, prompting the change in knowledge, attitudes and behaviour of respondents. Poster distribution and speech are both methods of mass health education.

Our study showed that a combination of both methods namely, poster distribution and monthly speeches by trained students to their fellow students during gathering events, such as the flag raising ceremony, proved to be more effective than poster distribution alone to improve the knowledge, attitude and behaviour of respondents ($p < 0.05$). Educational media in the form of posters requires a high reading interest from the target audience. Attractively designed posters are more likely to rouse curiosity and attract interest in reading and thereby to achieve the goals for which they were designed. In this study, we used posters that had been designed and used by the BPOM. In this field, however, when conducting in-depth interviews with students at the comparison site, the researchers found the interest of school children in reading this poster is lacking. Generally, the children read posters only when they were attached due to the curiosity.

The change in knowledge, attitude and behaviour of students who received the combination of the poster and group speech by UKS's cadre was greater. This was because the frequency at which the students received the stimulus in the form of information about healthy and safe snacks was more intensive and regular than that in the comparison group, when generally, the students read posters only once while some of them never even read the poster. Judging by the observations of the research team, the students who attended the

ceremony carefully listened the cadres' speeches, which they found compelling. During their speeches, the cadres wore white uniforms, which gave them a sense of pride and confidence to give speeches in front of their friends and teachers.

The pride of each school health programme cadre motivated them to always be passionate about promoting healthy and safe snacks. We observed this from the changes in speech and sharing skills, which improved every week. The growing interest among students to emulate the cadres motivated them to pay attention to the speeches delivered by their friends. Children need nutritional education to access the right nutritional knowledge and skills. Peer-based nutritional education models have a positive impact on students' nutritional behaviour. Peers can influence the knowledge and awareness of their fellow students and improve student self-reliance [24], [25].

The ideal and common places to provide health promotional interventions for children aged 6 to 12 years are educational institutions. Food marketing impacts children's food knowledge, behaviour and health. Understanding food marketing in children's everyday settings is necessary to protect children [26], [27]. Children's nutritional knowledge has shown an improvement with the increase of nutritional education programmes in schools [16], [28]. As previously shown, the nutritional education using the peer education model influences children's behaviour [22], [23], [29] and how they will select the food [30]. Nutritional education will increase the children's knowledge. Therefore, the children with higher knowledge scores are more likely to choose healthy snacks [11], [30].

Our research also found that pasting posters affected increasing the knowledge of street food vendors. However, when compared with the sharing and lecture methods given by *UKS's* cadres, the average change in knowledge of street food vendors who were intervened by *UKS's* cadres was higher than the knowledge of street food vendors given by posters. In our study, the promotion of healthy and safe snacks by *UKS's* cadres was more effective than the affixing of posters. From interviews with several school snack vendors who were given posters, they stated that they did not have time to read the posters because they were busy selling. Several sellers stated that they were not interested in reading the poster.

Sharing the information with the vendors has proved to be the most effective way of increasing their knowledge and skills. Apparently, the vendors took the information provided by the cadres of the school health programme about the personal hygiene and snacks. The vendors would have been embarrassed if they were caught by the school health programme cadres and in consequence, they always paid attention to cleanliness when engaged in selling. Vendors who sold snacks that are harmful to health were also approached by the school, but only after they were reported to the counsellor and principal by the school health programme cadres.

As most children attend school regularly and consume at least one meal and a number of snacks at school each day, the school-based programmes represent an ideal setting to enhance healthy eating. However, the current research suggests that the elementary school teachers often display low levels of nutritional knowledge, self-reliance and necessary skills to deliver effective nutritional education [31], [32]. By empowering the school health programme's cadres, the school-based programmes are effectively used as nutritional education programmes in schools.

Several studies showed that a peer approach to school-based health promotion is very effective in changing the healthy life behaviour of children. These improvements were achieved in parallel with progresses in diet quality, self-reliance and knowledge concerning healthy living [33]–[35]. The use of peer-to-peer approaches in health promotion interventions targeting youth seems to be a strategy with great potential. Peer leadership initiatives can increase physical activity for youth and children [36]. Darise, Deby Sinta (2021) in their research suggest that peer education can be used as an approach by schools for students to reduce the number of snack consumption habits in adolescents. In their research, they found that the peer education method affected increasing knowledge and attitudes related to snack consumption [37].

CONCLUSIONS

UKS's cadres as promotion providers of healthy and safe snacks are more effective when compared to the method of providing posters on the knowledge, attitudes, and behavior of students and snack sellers at school. *UKS's* cadres as promoters of healthy and safe snacks can be used as a mandatory *UKS* program in every school to achieve food safety for school children. This study did not analyze other factors that may also influence changes in the knowledge, attitudes, and behavior of respondents such as age, gender, parental education level, and other factors.

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CONFLICT OF INTEREST

The authors have no conflict of interests to declare.

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