

Realizing healthy culinary tourism through education in the 'Angkringan' street vendor community of Yogyakarta city during the COVID-19 pandemic

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ABSTRACT Angkringan is included in the culinary options of Java, although it involves a simple food stall on the roadside using a wheelbarrow and covered with a plastic tarpaulin as the roof. However, food safety is one of the main factors that influence tourists in choosing Angkringan culinary spots. Therefore, it is necessary to monitor the quality of food management by paying attention to health requirements including hygiene and sanitation procedures. This study aimed to analyze the differences in the food safety scores of Angkringan street vendors in Yogyakarta City before and after an intervention. We conducted a quantitative study with an experimental design from March to May 2021. We intervened with health education through pocketbooks in 49 communities of Angkringan street vendors in Yogyakarta tourism locations with a duration of one month. Data collection was conducted through the Food Safety Score Questionnaire while data analysis used Wilcoxon signed-rank tests. The majority of Angkringan street vendors had a category of Food Safety Score that was vulnerable but safe to consume before and after the pocketbook intervention. However, the influence of the intervention showed significant differences in research results (p -value < 0.05). This study concluded that health education interventions with pocketbooks among the Angkringan street vendors could positively affect food safety scores. We recommend that the government foster food hygiene education and monitoring of Angkringan street vendors, especially during the COVID-19 pandemic.

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1. Introduction

Yogyakarta city is one of the favorite tourist destinations in Indonesia. This student city is a tourist attraction because it has cultural attractions, art-filled museums, and tourist villages. Although the city of Yogyakarta experienced a decrease in tourist visits from 2014 to 2018 and the length of stay of tourists in 2018 did not reach the target, the development of shopping and culinary tourism makes tourists comfortable when visiting the city of Yogyakarta.^{1,2} In the culinary tourism sector, Yogyakarta has its

specialties, namely Angkringan, which serves cheap dishes with long carrying poles or charts. The family atmosphere between sellers and buyers in Angkringan makes this culinary option very popular. As a cultural-based tourist city, Angkringan street vendors can be found easily on every corner of Yogyakarta.³

One of the main factors that tourists pay attention to in choosing Angkringan culinary spots is cleanliness or hygiene.⁴ Food sanitation hygiene is an effort to control food factors, people, places, and equipment that can cause diseases or health problems. Sanitary hygiene requirements are technical provisions set out for restaurants and restaurant products, and their equipment includes bacteriological, chemical, and physical requirements.⁵⁻⁷

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By looking at the potential of Angkringan food and the high level of insecurity, it is necessary to supervise the quality of snack food management by paying attention to the rules for safe hygiene and sanitation, and health requirements. Pathogenic bacteria cause about 80% of foodborne diseases. Some types of bacteria that often cause disease include *Salmonella*, *Staphylococcus*, *E. coli*, *Vibrio*, *Clostridium*, *Shigella*, and *Pseudomonas cocovenenous*.^{8,9} The COVID-19 pandemic was easily transmitted from animals to humans and humans to humans through the contact of objects and food. There are few previous studies on food safety among Angkringan street vendors. Therefore, an intervention is required in the form of education by measuring food safety scores as the output. The research-based community aimed to analyze the differences in the food safety score of Angkringan street vendors in Yogyakarta before and after an intervention.

2. Method

This quantitative research was conducted with the design of pre-test and post-test experiments. The researchers conducted community-based interventions on groups of street vendors in the Malioboro tourist area, in Yogyakarta City from March to May 2021. The intervention provided education on food hygiene through pocketbooks, especially during the COVID-19 pandemic. The determination of samples was done through purposive and simple random sampling of as many as 49 communities of Angkringan street vendors. The sample was determined based on Angkringan data from the Kemantren Office in accordance with the inclusion criteria, which were Angkringan traders who sell and cook on site. Next, we randomly selected the data. Figure 1 shows the pocketbook used for community education. The respondents were asked to fill out the pocketbook on food hygiene and safety among Angkringan food vendors during the COVID-19 pandemic.

The researchers had obtained an ethical clearance letter before collecting the data. The data collection used food safety score questionnaires, which measure the selection and storage of foodstuffs, cooking hygiene, food processing, and

food distribution.¹⁰ The questionnaire had been standardized and filled by enumerators. Educational interventions using pocketbooks were conducted when collecting pre-test data directly and privately by paying attention to the COVID-19 health protocols. The duration of the intervention was one month. Next, the researchers took post-test data with the same questionnaire. The researchers conducted univariate and bivariate data analysis using the Wilcoxon sign rank test with results with $p < 0.05$ considered significant.

3. Result

The characteristics of 49 respondents of Angkringan street vendors are explained in Table 1. The average age of respondents was 44.7 years, and most had received higher education. However, most have never received counseling on Food Safety Score (FSS), so they mostly had FSS in the category of vulnerable but safe to consume, with self-cooked food and open deposit and presentation. Most of the respondents have been selling Angkringan for more than ten years, have been licensed, owned their cart, and made it their main job with an average daily income of Rp 184,590.

During the COVID-19 pandemic, most street vendors already had handwashing or hand sanitizer. Nevertheless, not all have imposed restrictions on the number of buyers or seating distance; there was an absence of body temperature checks; and not all traders and buyers use masks or face shields. Therefore, the researchers conducted the socialization of food hygiene pocketbooks, especially since the research was conducted in the “new normal” era. However, based on Table 2, there were no significant differences with a p -value of > 0.05 .

Figure 2 showed that some Angkringan street vendors had conducted COVID-19 health protocol. Although not all efforts have been made, at least the vendors in Angkringan provided a place to wash hands and the use of masks between sellers and buyers.

Based on Table 3, there was a significant difference (p -value < 0.05) in the food safety score between Angkringan street vendors before and after being given pocketbook intervention of Angkringan



Figure 1. The pocketbook of food hygiene and safety among Angkringan in the “new normal”.



Figure 2. The implementation of ‘new normal’ condition in Angkringan street vendors.

street vendors face to face or directly (Figure 3). Significant differences were in the selection and storage of foodstuffs, as well as the processing of foodstuffs. Meanwhile, there was no significant

difference in the category of hygiene cooks and food distribution (p -value > 0.05).

Table 4 explained the description of the Food Safety Score (FSS) of all respondents of Angkringan

Table 1. The characteristic of respondents.

Characteristics	Min	Max	Mean±SD	SE	N (%)
Age	17.00	65.00	44.70±11.22	1.44	
Daily income (Rp)	20,000	1,500,000	184,590±286,926	36,737	
Education level					
High					28 (57.2)
Low					21 (42.8)
Length of work					
≤ 1 year					10 (20.4)
1-5 year					10 (20.4)
>5-10 year					10 (20.4)
>10 year					19 (38.8)
Food safety knowledge					
High					16 (32.7)
Low					33 (67.3)
Food sales					
Self-cooked					5 (10.2)
Third party food supplier					3 (6.1)
Both of them					41 (83.7)

Table 2. The adaptation of new habits in Angkringan street vendors.

Characteristics	Pre-test		Post-test		p-value
	n	%	n	%	
Providing hand wash/hand sanitizer					0.335
Yes	33	67.3	35	71.4	
No	16	32.7	14	28.6	
Restriction on the number of buyers/seat distances					0.801
Yes	17	34.7	19	38.8	
No	32	65.3	30	61.2	
Wearing mask					0.181
Yes	23	46.9	27	14.3	
No	26	53.1	22	85.7	
Body temperature checks					0.199
Yes	4	8.2	7	14.3	
No	45	91.8	42	85.7	
Covered food					0.321
Yes	23	46.9	24	49.0	
No	26	53.1	25	51.0	
Total	49	100	49	100	

street vendors before and after being given pocketbook intervention. Based on post-test data, 42.9% of Angkringan street vendors still have FSS category vulnerable but safe to consume, while those with excellent and moderate categories were 28.6% in each food safety score.

4. Discussion

The study results mentioned that age, education, prior knowledge, and experience influence the

hygiene behavior of Angkringan traders in selling food products. The previous research mentioned that traders' knowledge will impact how they process and serve food to their customers. Therefore, someone who has good knowledge and understanding will improve the quality of food for their customers.¹¹ This tendency to improve the quality of sales services has to do with the desire to increase revenue.⁴

During the COVID-19 pandemic, several Angkringan street vendors have equipped facilities in

Table 3. Food safety score in Angkringan street vendors.

Food safety score	Min	Max	Mean±SD	p-value
Selection and storage of foodstuffs				0.026
Pre-test	0.00	0.16	0.1304±0.0420	
Post-test	0.07	0.16	0.1449±0.0261	
Cooking hygiene				0.455
Pre-test	0.06	0.15	0.1190±0.0189	
Post-test	0.06	0.15	0.1222±0.0253	
Food processing				0.028
Pre-test	0.00	0.59	0.4824±0.1332	
Post-test	0.37	0.59	0.5267±0.0575	
Food distribution				0.584
Pre-test	0.05	0.13	0.1092±0.0171	
Post-test	0.07	0.14	0.1073±0.0202	
Total				0.019
Pre-test	0.19	0.99	0.8366±0.1773	
Post-test	0.65	1.04	0.9012±0.1059	

Table 4. Food safety score category in Angkringan street vendors.

Characteristics	Pre-test		Post-test		p-value
	n	%	n	%	
Good	3	6.1	14	28.6	0,041
Moderate	11	22.4	14	28.6	
Prone but safe to consume	32	65.3	21	42.9	
Prone and not safe to consume	3	6.1	0	0	
Total	49	100.0	49	100.0	

the sales location with handwashing, hand sanitizer, wearing masks when selling, as well as restrictions on the number of buyers. This is done to increase buyers' confidence in potential vulnerabilities in the era of the COVID-19 pandemic. Previous research explained that the location, facilities, and quality of service influence consumers' decision to choose Angkringan stalls.⁴

Food safety is an essential prerequisite of food.⁹ We did the measurement of food quality of the Angkringan street vendors using a food safety score questionnaire. This questionnaire is valid and contains four measurement categories: the selection and storage of foodstuffs, cooking hygiene, food processing, and food distribution.¹⁰ The absence of any significant difference can occur because not all food sold in Angkringan street vendors is cooked alone or is a food deposit. At the same time, the study did not provide interventions to distributors or the suppliers of food. There is also the absence of uniformity of Angkringan food suppliers, so the

quality standards of the food cannot be known.

Maintaining the quality of street food services requires a community-based educational intervention.⁷ We provided education on food hygiene and safety, ranging from selecting and storing foodstuffs, cooking hygiene, food processing, and food distribution.¹⁰ In other research, the good knowledge and practice of food safety demonstrated by the respondents corroborated the negligible prevalence of Salmonella, reiterating the importance of vendor meat safety knowledge.¹² The use of pocket books as a medium of health education, has practical value for street vendors. However, interventions can use a variety of practical media, such as pocketbooks or videos. These interventions should be done by monitoring and evaluating to get optimal results. Based on post-test data, most Angkringan street vendors still have FSS category that is vulnerable but safe to consume. Therefore, a relatively short intervention (4 weeks) was not enough to change Angkringan street vendors in maintaining food

hygiene.

The limitation of this study is that it only uses quantitative studies to measure community education interventions. Some conditions do not allow qualitative data retrieval. Therefore, further research is needed to explore the barriers to the intervention so that the implications can be used for further evaluation. The national government and Yogyakarta city have issued policies on food sanitation hygiene requirements and sanitation hygiene for food management.^{13,14} Enforcement of the regulations to control for unhealthy foods and beverages is urgently needed.¹⁵ The review of the policy needs to be done by adjusting the conditions to the COVID-19 pandemic. This research can be the basis for creating policy briefs as the basis of program implementation policy. Although it has some limitations, the results of this study have implications for public health interventions. Health education efforts using pocketbooks can be an alternative to providing information in the COVID-19 pandemic to adjust the characteristics of street vendors.

5. Conclusion

This study concluded that health education interventions with pocketbooks in the Angkringan street vendors affect food safety scores, especially for selecting and storing foodstuffs and food processing. Most Angkringan street vendors in Yogyakarta have a food safety score that is vulnerable but safe to consume before and after the intervention. The majority of Angkringan vendors have implemented COVID-19 health protocol, especially using masks and providing hand sanitizer facilities. We recommend that the government can foster food hygiene education and monitoring of Angkringan street vendors, especially during the COVID-19 pandemic.

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Conflict of interests

On this project, there is no conflict of interest. The

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