

The Effect of Podcast and Flashcard on Knowledge of Safe Food Selection in Students of MAN 2 Bogor

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ABSTRACT

Introduction: Adolescent girls often prioritize social trends over nutrition or food safety, contributing to high rates of food poisoning—48% at home and 21% at school. To address this, engaging educational media is needed. This study analyzes the impact of podcast and flashcard media on food safety knowledge among female students at MAN 2 Bogor City. **Method:** This study is a quantitative study with a True experimental research design with a pre-test post-test control group design. Data were collected through pre-test and post-test to measure respondents' knowledge. **Results:** Data analysis using the Paired Sample T-test showed significant changes in increasing students' knowledge about choosing safe food before and after education using podcast and flashcard media, as indicated by the p-value in the pre-test and post-test of 0.000, which means the value is <0.05 in the podcast group and 0.001 (<0.05) in the flashcard group. **Conclusion:** This study concludes that both podcast and flashcard media significantly improve students' knowledge in choosing safe food ($p < 0.05$). Podcast media, in particular, is effective for educating adolescents. To enhance understanding, future efforts should emphasize the body's response to unsafe food and involve a broader range of research subjects.

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INTRODUCTION

Food selection is the process by which a person determines the food he or she wants to consume, based on the health aspects of the food, taste, aroma, color, and etc (Apriliani et al. 2021). However, along with the development of science and technology, especially media exposure, it has become an important aspect that contributes to the increase in non-communicable diseases (Ayuningtyas et al. 2021). Chen (2020) mentioned that several studies highlighted that eating habits and food choices have changed along with changes in the global food system and food supply leading to a shift towards increased consumption of unhealthy foods and products, these changes occur due to various factors, such as internal factors, external factors and, cognitive factors (Chen dan Antonelli 2020). Adolescents are individuals in the age range of 10 to 19 years, the adolescent phase is an important transitional stage between childhood and adulthood, at this stage of development is marked by many changes, including physical, psychological, hormonal, social and puberty development which causes increased nutritional needs (Ekayanti, Rimbawan, dan

Kusumawati 2020), one of the characteristics that is typical of teenagers is having a great sense of curiosity, liking challenges, and usually daring to make decisions without thinking about the long-term risks (Firmansyah et al. 2023). Thus, most teenagers today do not consider food choices in terms of nutritional content or food safety, but rather focus more on socializing with peers with the aim of not losing their status (Permatasari et al. 2023). Yusintha's (2018) research conducted on 53 female students stated that teenagers can already choose the food they like without looking at what ingredients are contained in it (Yusintha dan Adriyanto 2018).

This phenomenon is in line with the results of a preliminary survey, where the survey results showed that 60% of female students prioritize the taste and appearance of food without considering its quality, while 40% of female students are easily influenced by peers when choosing food. This is in line with data from the Food and Drug Supervisory Agency (BPOM) 2023, which recorded a high number of Extraordinary Food Poisoning Incidents (KLB KP) in the school environment as much as 21% which can be triggered by a lack of awareness of food safety.

The impacts that can occur from this phenomenon include, lack of knowledge about food selection can increase the risk of consuming unhealthy foods, which have the potential to cause non-communicable diseases or diseases due to food contamination. This is in line with data recorded by the World Health Organization (WHO) where food contaminated by bacteria, viruses, parasites, or chemicals can cause more than 200 diseases (WHO 2022). In addition, based on the report of the POM Center in 2023 through the Public Information Reporting System for Food Poisoning (SPIMKER) application, there were 122 cases of Extraordinary Food Poisoning Events (KLB KP) involving 8,937 people, of which 4,729 showed symptoms of illness with an attack rate of 52.91%. On the other hand, 18 people died (case fatality rate of 0.38%) (BPOM 2023), the cause of the most KP outbreaks was microbiological, with 68 incidents, both suspected and confirmed, with 42 (34.43%) and confirmed 25 (21.31%). In addition, the high number of KP outbreaks was caused by food produced by households, catering services, snacks, domestic food, foreign food, and Household Industry Food (PIRT) of 53.28% in 2023. According to the location of the incident, KP outbreaks often occurred in residences with 59 incidents (48%), and schools with 26 incidents (21%) (BPOM 2023) this situation can also worsen the food selection habits of adolescents who do not pay attention to nutritional content or food safety which contributes to public health problems.

The involvement of female students in food selection based on the results of the researcher's initial observations is seen in terms of decision making when choosing food to be consumed which is based on preferences such as taste, appearance of food and peers. However, limited knowledge about food safety can cause them to choose unhealthy foods and foods that are not guaranteed to be clean. Therefore, increasing knowledge needs to be done through education and health promotion by utilizing appropriate and effective media to increase knowledge (Adawiyah, Rizona, dan Purwanto 2020), the media that can be used to convey messages can be in the form of visual, audio, audio-visual and multimedia media (Fathoni et al. 2023). The media applied in this study were flashcards and podcasts, where flashcards are educational media in the form of picture cards with medium size and are practical in their use (Putri dan Alfurqan 2023), meanwhile podcasts are audiovisual media that contain recordings of conversations with a duration of between half an hour and one hour, which discuss interesting and specific topics (Putri 2022). Based on this background, researchers are interested in analyzing the influence of podcast and flashcard media on food selection knowledge among female students at MAN 2 Bogor City.

LITERATURE REVIEW

According to Notoatmojo (2012) knowledge is the result of understanding obtained after someone interacts with a certain object that plays an important role in forming individual attitudes. A person's knowledge is influenced by many factors, such as level of

education, sources of information, and experience, both obtained personally and from others (Notoatmojo 2012).

Food selection is how a person chooses the food or food they want to consume, whether it is reflected in the health of the food, taste, aroma, color, etc. (Apriliani et al. 2021), Chen (2020) stated that several studies highlighted changes in eating habits and food choices have changed due to internal, external, personal and cognitive factors (Chen dan Antonelli 2020).

Food safety is an action that must be taken to prevent potential biological, chemical, or foreign object contamination that can cause disruption, loss, and risk to human health. In addition, food safety must also be in line with religious values, beliefs, and culture of the community so that it is suitable and safe for consumption (Pangan 2024). Food safety needs to be considered in order to improve health levels and avoid various diseases (Wardani dan Setiyaningrum 2019).

Podcasts are a form of entertainment packaged in audio and audiovisual formats containing recorded conversations with a duration of between half an hour and one hour, which discuss interesting and specific topics (Putri 2022). Podcasts are considered a more authentic form of work and provide greater control over the media they access (Martianto dan Toni 2021).

According to Susilana (2009) in Wahyuni (2019) flashcards are educational media in the form of picture cards with medium sizes. Images on flashcards can be made manually, using photos, or from existing images and attached to the card (Wahyuni dan Amareta 2019).

METHOD

This study uses a quantitative approach with a True experimental design, where samples for the experimental and control groups are randomly selected from the population. The independent variable in this study is education with podcast and flashcard media, the dependent variable in this study is knowledge in female students. The design used is a pre-test post-test control group, where samples are randomized and given a pre-test before education, then a post-test after education for both groups, both experimental and control. The instruments used in this study consisted of a characteristic questionnaire covering class, age, pocket money, exposure to information about choosing safe food before being given education, and sources of information media about choosing food obtained by the subject previously, a knowledge questionnaire about choosing food consisting of 15 questions with multiple choice questions, educational media video podcasts and flashcards. The sampling technique was simple random sampling, with a sample size of 32 people in each group, so that the total respondents from both groups reached 64 people. The data collection technique in this study used a pre-test and post-test questionnaire by providing 15 open-ended questions with multiple choice questions about choosing food using a google form. Paired data analysis used paired sample t-test, and to compare respondents' knowledge between groups using independent sample t-test and, for the podcast and flashcard group difference test using Mann Whitney because the data was normally distributed.

This study was conducted for one week with alternating days, on the first day respondents filled out informed consent and pre-test questionnaires, then continued with education for both the podcast and flashcard groups on the topic of signs of unsafe food with different classrooms, the third day education was provided on the topic of causes of unsafe food, and on the fifth day after education on the topic of the body's response when consuming unsafe food, respondents filled out a post-test questionnaire. This study has received approval from the Binawan University Health Research Ethics Committee with ethics number No. 134 / KEPK-UBN / VI / 2024.

RESULT AND DISCUSSION

The data in this study were obtained from primary data in the form of questionnaires on respondent characteristics and knowledge submitted to respondents. Based on the results of the study, 64 respondents were registered in this study, the respondents in grade XI in the podcast and flashcard groups were more (53.1%) while the respondents in grade X in the podcast and flashcard groups were (46.9%). The majority of respondents in this study were 16 years old in both groups than 17 years old. The majority of respondents in both groups had moderate monthly pocket money, in the podcast group (50.0%) and the flashcard group (53.1%). Based on previous information exposure, most respondents stated that they had received information about choosing safe food and the majority got information from social media 13 (40.6%).

Table 1. Characteristic of Respondents (N=64)

Variable	Podcast		Flashcard	
	n	%	n	%
Class				
X	15	46,9	15	46,9
XI	17	53,1	17	53,1
Age				
16 Years	18	56,3	19	59,4
17 Years	14	43,8	13	40,6
Pin Money/Month				
<Rp. 500.000	11	34,4	12	37,5
Rp. 500.000-1.000.000	16	50,0	17	53,1
>Rp. 1.000.000	5	15,6	3	9,4
Previous information exposure				
Ever	23	71,9	29	90,6
Never	9	28,1	3	9,4
Source Information				
Health Worker	3	9,4	4	12,5
Parents	3	9,4	9	28,1
Website	3	9,4	3	9,4
Sosial Media	13	40,6	13	40,6
Poster/Leaflet/Billboard	1	3,1	0	0

Overview of Knowledge Before and After Education

Based on the results of the research that has been conducted, the results obtained in the podcast group show that before the provision of education, the majority of students' knowledge about choosing safe food was classified as good, namely 1 (3.1%) person, 2 (6.25%) people were classified as having sufficient knowledge, and 29 (90.6%) people were classified as having insufficient knowledge. On the other hand, the value of students' knowledge about choosing safe food after being given education with podcast media was obtained as many as 18 people (56.2%) included in the category of having good knowledge, 14 people (43.7%) included in the category of having sufficient knowledge, and there were no students who were classified as having insufficient knowledge.

Then, in the flashcard group, it was seen that before the provision of education with flashcards, students' knowledge about choosing safe food was obtained as many as 1 person (3.1%) included in the good category, 4 people (12.5%) included in the category of sufficient knowledge, and 27 people (84.3%) included in the category of lacking knowledge. On the other hand, the value of students' knowledge about choosing safe food after being given education showed that 1 person (3.1%) was categorized as good knowledge, 14 people (43.7%) were categorized as sufficient knowledge, and 17 (53.1%) were categorized as lacking knowledge. The increase in knowledge value was influenced by various factors that contributed to knowledge, such as education level, access to information or mass media, experience, and social, cultural, and economic aspects (Susilawati, Pratiwi, dan Adhistry 2022).

Table 2. Overview of Knowledge Before and After Education

Variable	n	Percentage (%)
Score Pre-test Podcast		
Good	1	3,1
Enough	2	6,25
Less	29	90,6
Score Pre-test Flashcard		
Good	1	3,1
Enough	4	12,5
Less	27	84,3
Score Post-test Podcast		
Good	18	56,2
Enough	14	43,7
Less	0	0
Nilai Post-test Flashcard		
Good	1	3,1
Enough	14	43,7
Less	17	53,1

Knowledge Level Before and After Education in Podcast and Flashcard Groups

Based on the average pre-test score in the podcast group, it was 42.12, while in the flashcard group it was 40.22. The results of this study showed that there was no significant difference between groups in the pre-test, with (p-value = 0.589). This means that before education was given on choosing safe food, both groups had the same level of knowledge. Then the average post-test score was obtained in the podcast group with a result of 79.34 while the flashcard group was only 52.47, so there was a significant difference (p-value = 0.000) between the group using the podcast and the group using the flashcard after education.

Table 3. Knowledge Level Before and After Education in Podcast and Flashcard Groups

Variable	Podcast Group	Flashcard Group	p-value
Pre-test	42.12±14.908	40.22±13.107	0,589 ^a
Post-test	79.34±10.372	52.47±13.784	0.000 ^a

^aIndependent sample t-test

The Influence of Podcast and Flashcard Group Education on Students' Knowledge at MAN 2 Bogor City

The results of the analysis using the Paired Sample T-test indicate an increase in students' knowledge regarding safe food selection after education through podcast media. This increase is evidenced by the p-value in the pre-test and post-test of 0.000, which is less than 0.05. Therefore, it can be concluded that there is a significant change in knowledge in the group that received education using podcasts. The findings in this study are in line with Muthmainah's (2021) research, which found that the intervention using podcast media succeeded in significantly increasing adolescent knowledge. The average knowledge of adolescents before the intervention was recorded at 10.00, while after the intervention it increased to 15.21, with a p-value obtained of 0.000 (Muthmainah, Rahayu, dan Muhdar 2021).

Table 4. The Influence of Podcast and Flashcard Group Education on Students' Knowledge at MAN 2 Bogor City

Variable	Pre-test	Post-test	p-value
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Podcast Group	42.13±14.908	79.34±10.372	0.000 ^a
Flashcard Group	40.22±13.107	52.47±13.784	0.001 ^a

^aPaired sample t-test

In addition, research conducted by Fitri (2022) also showed a significant increase in knowledge after intervention with podcasts, as seen from the increase in the average respondent score from 74.8 before the intervention to 86.4 after, with a p-value of 0.000 (<0.05) (Fitri dan Kurniasari 2022), and research by (Wicahyani, Purnamayanti, dan Bukian 2021) concluded that providing video-based education was quite effective in increasing family support in preventing diabetic foot complications, with statistical test results of 0.009 ($p < 0.05$). In addition, the increase in the average value of respondents' knowledge occurred because it was influenced by the media according to Martianto (2021), podcasts are digital media in the form of audio or video (Martianto dan Toni 2021), which includes conversations lasting half to one hour on interesting and detailed topics (Simbolon dan Simbolon 2021). Then, Fitria's research in Sultan (2020) revealed that the podcasts presented were meaningful, appropriate, and could increase students' motivation and understanding in listening (Sultan et al. 2020). Although podcast media can have an influence on increasing knowledge in female students, there needs to be reinforcement on the topic of the body's response when eating unsafe food where as many as 46.8% of female students still answered with incorrect answers.

The Paired Sample T-test showed a significant change in increasing students' knowledge regarding safe food selection, both before and after education using flashcard media. This can be seen from the p-value obtained in the pre-test and post-test, which was 0.001, which means that the value is <0.05 . Thus, it can be concluded that there was a significant increase in knowledge in the group using flashcard media. These results are in line with research conducted by Emilia (2022), which stated that education using flashcard media for adolescents had a significant impact on knowledge. Before education, the average knowledge score was 70.810, while after education it increased to 84.138, with a statistical p-value of 0.001 (Emilia, Ratmawati 2022).

In addition, research conducted by Dahliansyah (2024) showed that there was an increase in knowledge after education using flashcard media. The average knowledge score before education was 41.27, while after education it increased to 85.14. The results of the analysis using the paired t-test showed a p-value of 0.000, indicating the significance of the increase, then Dahliansyah's research (2024) stated that flashcards that are attractively designed where questions, pictures and answers are listed on the front side on the back, which can make respondents interested in playing and can increase knowledge (Dahliansyah, Karunia, dan Gambir 2024). Although there was an increase in knowledge in the flashcard media group, there needs to be reinforcement on the topic of the body's response when eating unsafe food, where as many as 31.25% of female students still answered with incorrect answers.

Table 5. Podcast and Flashcard Group Difference Test

Group	Mean ± SD	p-value
Pretest		
Podcast	42.13±14.908	0,589 ^a
Flashcard	40.22±13.107	
Posttest		
Podcast	79.34±10.372	0,000 ^b
Flashcard	52.47±13.784	
Difference between pre-test and post-test averages		
Podcast	37,22 ± 15.271	0,000 ^c
Flashcard	12,25 ± 19,369	

^{ab}Independent sample t-test, ^cMann whitney

The table above shows the pretest results for two groups, namely those using podcast and flashcard media, with an independent sample t-test value of 0.589 ($p > 0.05$). However, the posttest results for the podcast and flashcard groups showed a value of 0.000 ($p < 0.05$), indicating that there was a significant difference in the post-test scores between the two groups. The analysis of the mean difference using the Mann-Whitney test also obtained a result of 0.000 ($p < 0.05$), indicating a significant difference in the difference in post-test and pre-test results between the two groups. With a p-value < 0.05 in the Paired sample t-test, it shows a significant influence after respondents were given an educational program on choosing safe food for female students using podcast and flashcard media. This study shows that educational media has the potential to be useful in fostering new desires and interests, motivating and stimulating learning activities, and playing an active role in encouraging increased knowledge of female students (Junaidi 2019). This finding is in line with the results of research conducted by Rezeki (2023), where the video and flashcard media applied can increase students' awareness of healthy and clean snacks, with a sig. value of 0.000 (Rezeki, Renjani, Lehianti, 2023) this is in line with the results of the research conducted, that video podcast media attracts more attention. Then, the results of research by Kharisma (2023) using leaflet and flashcard media obtained a p-value of 0.029, but providing education with flashcards got a smaller average, namely 28.64 while on leaflets 29.39 (Kharisma dan Imami, 2023), in line with the results of research that has been conducted where education with video podcast media obtained an average of 79.34 and on flashcards 52.47.

On the other hand, this is not in line with the research results of Arip (2024), which found that flashcard game media was more effective in increasing adolescent knowledge about reproductive health compared to animated video media with the results of the Mann Whitney test $p < \alpha 0.05$ (Arip, Amanda, Rusmini 2024), the thing that differentiates the research conducted between video podcast media and flashcards is that in the field, respondents are more interested in watching and listening to material with podcast media, because podcast media uses a form of direct communication between the resource person and the moderator, making respondents feel more involved when watching and listening to podcasts and can encourage active improvements to the knowledge provided (Angela dan Kurniasari 2021). On the other hand, in the flashcard group, respondents were less interested in providing education and answering the questions given, resulting in respondents' knowledge in the flashcard group being lacking. This occurred because the flashcard media could not convey the impression of movement, emotion or sound in a more interactive way (Putri dan Alfurqan 2023).

CONCLUSION

This study concluded that podcast and flashcard media have an influence on students' knowledge in choosing safe food, with a p-value of 0.000 ($p < 0.05$) for the podcast group and 0.001 ($p < 0.05$) for the flashcard group. In addition, the results of the average difference test between the pre-test and post-test in both groups showed a p-value of 0.000, which indicated a significant influence of education on choosing safe food on students using podcast and flashcard media. Based on the results of this study, podcast media can be used for education for adolescents. However, to improve students' understanding, it is necessary to strengthen the topic regarding the body's response when consuming unsafe food, and for further researchers, they can expand the scope of the research subjects.

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