

RESEARCH STUDY

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The Effect of Nutrition Education Through Social Media on Nutritional Knowledge and Menu Selection in Food Delivery Application

Pengaruh Edukasi Gizi Melalui Media Sosial terhadap Pengetahuan Gizi dan Pemilihan Menu di Aplikasi Pesan Antar Makanan

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ABSTRACT

Background: Adolescents tend to use online food delivery service applications rather than going to food stalls or restaurants to buy food, but most of the food and drinks offered contain high levels of fat, sodium, and sugar but are low in other nutrients. Currently, WhatsApp ranks first in the social media category with the most active users, with teenagers being one of the users. Previous studies have not yet analyzed behavior change and the effectiveness of each medium in the same study. Therefore, the authors are interested in conducting research by providing nutrition education interventions through WhatsApp through digital posters, audio, and video.

Objectives: Analyzed the effect of nutrition education through social media on nutritional knowledge and menu selection in food delivery applications.

Methods: This research design was quasi-experimental. This research was conducted in Bekasi in 2022, with the research sample being teenagers using food delivery applications and WhatsApp. The number of samples in this study was 111, divided into three groups: audio, poster, and video. Knowledge improvement was assessed by the results of pre-test and post-test questionnaires, while changes in menu selection were seen from the results of 2x24 hour Food Recall. Nutrition education was carried out four times with a frequency of 1 time a week through the WhatsApp group. The effect of nutrition education on knowledge and menu selection was analyzed using the Wilcoxon test, paired t-test, and Kruskal Wallis.

Results: There was an effect of knowledge of balanced nutrition, so there was a significant difference in nutritional knowledge ($p < 0.05$) in the subjects of the entire intervention group after being given the intervention. Likewise, the menu selection in the food delivery application experienced a positive change after the intervention ($p < 0.05$). The subject began to choose nutrient-dense menus in the food delivery application. However, there was no difference in effectiveness between educational media ($p > 0.05$).

Conclusions: There is an effect of nutrition education using audio, poster, and video on menu selection in food delivery applications.

INTRODUCTION

A survey by the Association of Indonesian Internet Service Providers (APJII) shows that there are 196.7 million digital technology users in Indonesia¹. The digital marketing technology currently developing is food and beverage delivery applications such as Gofood, Grabfood, Shopeefood, and so on². Grabfood is the food delivery application with the highest total purchases or Gross Merchandise Value (GMV) in Indonesia, which is 49% of the total GMV at watch out Southeast Asia or 15.5 billion US dollars. The second position was occupied by Gofood with 43% or US\$2 billion, followed by Shopeefood with 8% or US\$0.9 billion³.

Teenagers use online food delivery service applications rather than going to food stalls or

restaurants to buy food⁴. However, most foods and drinks have high levels of fat, sodium, and sugar but low levels of folate, fiber, vitamin C, vitamin A, and calcium⁵. Food delivery applications are currently in demand by teenagers because they provide easy access to services, the menus available are varied, and they offer various attractive promos. This reason can impact excessive menu ordering transaction and triggers a diet that is not nutritionally balanced⁶.

According to Contento, food selection has several factors, including intrapersonal factors. Regarding intrapersonal factors, knowledge becomes one of the processes in food selection in addition to abilities, social norms, and culture⁷. Several factors influence the food choices of adolescents in agencies

and cities, one of which is nutrition knowledge⁸. In research conducted on university students, various factors contributed to the food selection by students, but knowledge became the main factor in it⁹.

The role of health education, especially nutrition, is limited to someone knowing health information and, more importantly, the emergence of healthy behavior in everyday life¹⁰. The more frequent the frequency of exposure of a person with good nutritional knowledge, the more motivated adolescents are to apply this knowledge in their daily lives¹¹. Several studies show that social media is effective in increasing nutritional knowledge¹². A study using Facebook showed increased knowledge of anemia and consumption of vitamin C, protein, and iron in young women in Tebas Kuala Village¹³. Apart from Instagram and Facebook, WhatsApp is also one of the social media used to provide education. WhatsApp ranks first in the category of social media that has been used the longest in a month. The average duration of WhatsApp usage in Indonesia is 30.8 hours per month¹⁴.

The study results show that WhatsApp is effective for learning, marked by increased student knowledge¹⁵. According to students, messages and pictures on WhatsApp support the learning process¹⁵. Other studies have shown that there is a change in consumption patterns of snacks for the better after being given nutrition education via WhatsApp to students of SMK Darussalam Karangpucung and SMK Negeri 1 Karangpucung, Indonesia¹⁶. The results of nutrition education via WhatsApp once to young women at SMPN 21 Penajan Paser Utara, East Kalimantan, Indonesia, showed an increase in knowledge but no change in attitude¹⁷. Nutrition education conducted for students of SMAN 3 Bogor via WhatsApp 10 times increased knowledge and attitudes related to balanced nutrition¹⁸. For this reason, the authors conducted research to analyze the effect of nutrition education via WhatsApp on menu selection in food delivery applications.

METHODS

The quasi-experiment design was used in this study. This research was carried out in Bekasi in 2022 with a sample of teenagers who use food delivery applications and WhatsApp. The number of samples in this study was 111, divided into three groups: audio, posters, and videos. Determination of the sample to see suitability with the inclusion criteria that is 14-18 years old, using WhatsApp, often (> 3 times a week) ordering food through a delivery application, and willing to be subject by signing an informed consent.

This study has received research ethics approval from Commission Research Ethics Esa Unggul University with number 0922-03.053/DPKE-KEP/FINAL-EA/EU/III/2022. The researcher compiles balanced nutrition material that will be used as the basis for making nutritional education media. The material provided regarding nutrition is based on the Regulation of the Minister of Health of the Republic of Indonesia (PERMENKES RI) Number 41 of 2014. The material applied to the three intervention groups is the same. The only difference was the media type. Each WhatsApp

group has 1 type of intervention media, so there are three different WhatsApp groups. The media was first tested before being given to the research subjects.

Retrieval of knowledge data using pre- and post-test questionnaires containing 20 questions with the lowest score of 0 and the highest score of 20. The questionnaire was prepared by adapting educational materials from the Regulation of the Minister of Health of the Republic of Indonesia (PERMENKES RI) Number 41 of 2014. Before being given to the subject, the knowledge questionnaire was then tested for validity and reliability, which showed that each question item was valid ($r_{count} > r_{table}$) and reliable (Cronbach alpha > 0.6). The research phase began by sending a pre-test questionnaire link containing informed consent to each WhatsApp group. There are three WhatsApp groups: poster, audio, and video. Then, interviews were conducted for each subject through a Zoom Meeting regarding food intake consumed on weekdays and holidays (1 day each) and menu selection on the food delivery application before the intervention. Furthermore, nutrition education is provided by sending posters, audio, and video according to the group's media type¹⁹.

The pre-and post-test results will show the subject's nutritional knowledge changes. In contrast, the results of the 2x24-hour recall would be grouped into groups of nutrient-dense food types (foods that contain high nutritional value but low in calories, e.g., allow or fat-free dairy products, green leafy vegetables, nuts, etc.), sweet foods/drinks (containing high sugar such as cakes, fruit, pudding, etc.), and fatty foods (containing cholesterol, saturated fat, and trans fat, and processed by frying, such as seafood, fried food, fast food, etc.). The final process in research was to analyze the collected data and conclude the research results. The effect of nutrition education on knowledge and menu selection based on data normality was analyzed using the Wilcoxon test, paired t-test, and Kruskal Wallis. The results of the data normality test for the knowledge scores of the audio, poster, and video groups used the Shapiro Wilk test, namely pre-test ($p = 0.173$; $p = 0.537$; $p = 0.813$) post-test ($p = 0.373$; $p = 0.065$; $p = 0.087$). The data analysis was continued with paired t-tests to determine whether nutrition education has an effect. The difference in the knowledge scores of the poster and video groups based on the normality test using Shapiro Wilk was declared not normally distributed ($p=0.006$ and $p<0.001$), while the difference in knowledge scores in the audio group was normally distributed ($p=0.176$). Therefore, data analysis was continued with Kruskal Wallis to determine the effectiveness of educational media.

RESULTS AND DISCUSSION

Table 1 shows the characteristics of the subjects, including age, gender, and online food delivery application used. The total subjects were 111 people aged 14 to 18 and were dominated by young women (70.3%). It related to the survey results of the Statista Institute (2021) that teenage girls, namely 6.8%²⁰, dominate social media users aged 13-17 years in Indonesia. The three food delivery applications used by

the subjects in this study were Shopeefood (26.2%), Gofood (36.9%), and Grabfood (36.9%). Using food delivery applications such as Gofood, Grabfood, and

Shopeefood is also based on time efficiency, distance to store locations, avoiding traffic congestion, being busy with schoolwork, and others²¹.

Table 1. Analysis of subject characteristics of all intervention groups

General Characteristics	n	%
Age		
14	9	8.1
15	12	10.8
16	24	21.6
17	27	24.3
18	39	35.2
Total	111	100
Gender		
Woman	78	70.3
Man	33	29.7
Total	111	100
Online application		
Gofood	41	36.9
Grabfood	41	36.9
Shopeefood	29	26.2
Total (N)	111	100

Figure 1 shows the paired t-test of the subject's knowledge score. The mean score of nutritional knowledge of audio group subjects before nutrition education was 10.16; after nutrition education, it was 13.54. The poster group subjects had an average knowledge score before receiving nutrition education of 11.27; after it, it was 13.30. The video group subjects also obtained an increase in the average knowledge score with a score of before being given education 11.68 and after nutrition education 15.95. The results of the paired sample t-test showed that there was a significant difference ($p < 0.05$) in the mean score of nutrition

knowledge before and after the intervention, with $p < 0.001$ in the audio group, $p = 0.002$ in the poster group, and $p < 0.001$ in the video group.

Knowledge of balanced nutrition of subjects from all intervention groups increased after nutrition education. Audio, digital posters, and stop-motion videos equally increase subject knowledge. This finding is because posters stimulate interest to be noticed²². Audio media is easy to understand, flexible, and can be memorized²³. Likewise video that utilizes the senses of sight and hearing so that the recipient of the message can easily understand it²⁴.

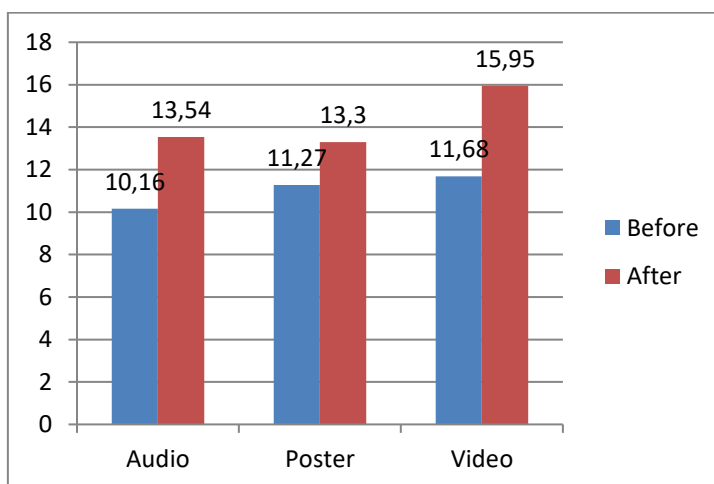


Figure 1. Increase in average knowledge of nutrition before and after intervention

Providing nutrition education through audio, poster, and video to the subjects in this study increased the subject's knowledge about balanced nutrition. This

finding is reinforced by research on nutrition education using audio conducted by Aliya and Muwakhidah. That is, there is an increase in students' knowledge in

elementary school by 14.9%²³. Other research shows an increased knowledge attitude of students after being given nutrition education through posters. The average value of knowledge before providing nutrition education was 8.86, and the average value of knowledge after nutrition education was 11.57²⁵. Similar results were also shown in research involving SDN 16 Samarinda, Indonesia students. Students' nutritional knowledge was balanced after midget education with video media increased to 85.4%. The accuracy of using methods and media in the intervention causes dizziness²⁶ and the strength of nutritional knowledge after being given an intervention. Visual messages in images are easier to remember, especially if the intervention media combines audio and visual. The brain then processes information obtained from sensory memory to become an understanding²⁵.

The Kruskal-Wallis test was conducted to determine whether there was a difference in the increase in nutritional knowledge between the intervention groups. The test results can be seen in Table 3, which shows a difference in the increase in nutrition knowledge between the intervention groups

($p > 0.05$). However, all media are equally effective in increasing the subject's knowledge of balanced nutrition. There were differences in the increase in nutritional knowledge between the intervention groups because the media used had their respective advantages. Digits poster is designed with writing and pictures that can stimulate interest to get more attention²². Audio media has the advantage of being flexible, easy to understand, and memorized²³. The combination of visual and audio forms video media that utilizes the senses of sight and hearing so that complete information is received²⁴. Another way is by providing education about hypertension using posters and audio media like podcasts. A study also shows no significant difference in the effectiveness of the two media because both significantly increase subject knowledge²⁷. However, the results did not come from research to measure the effectiveness of posters and video media in increasing students' knowledge and attitudes about vegetables and fruit. There are differences in effectiveness between posters and videos, where videos are more effective than posters²⁸.

Table 2. Differences in increasing nutrition knowledge between intervention groups

Intervention Group	n	Mean ± SD	p-value
Audios	37	4.27 ± 2.14	0.114
Posters	37	3.76 ± 3.16	
Videos	37	3.22 ± 2.81	

Differences in menu selection in food delivery applications before and after the intervention were conducted using the Wilcoxon test. Table 3 shows a significant difference ($p < 0.05$) in menu selection in food delivery applications before and after the intervention. The selection of menus in the food delivery application has changed, especially in the selection of nutrient-dense menus. None of the subjects from the three

intervention groups ordered a nutrient-dense menu before being given the intervention. However, after receiving the intervention, there was a change in the selection of menu types by subjects from all groups. These results align with research on students at the Islamic University of Melaka, which states that knowledge is the main factor in food selection⁹.

Table 3. Differences in menu selection in food delivery applications before and after intervention

Intervention Group	Type	Before		After		p-value
		n	%	n	%	
Audios	Nutrient dense	0		14	37,8	<0.001
	Sweet	11	29,7	9	24,3	
	Fatty	26	70,3	14	37,8	
Poster	Nutrient-dense	0		11	29,7	0.002
	Sweet	8	21,6	6	16,2	
	Fatty	29	78.4	20	54,1	
Videos	Nutrient-dense	0		7	18,9	0.025
	Sweet	12	32,4	11	29,7	
	Fatty	25	67,6	19	51,4	

This study's results align with research in the form of Android-based nutrition education and websites with the results of the two media that can improve balanced nutrition behavior in elementary school students²⁹. After a person gets a stimulus, there is a

process of evaluating what is obtained. Someone will apply what has been obtained so that it becomes behavior. Other studies have shown that there is a change in consumption patterns of snacks for the better after being given nutrition education via WhatsApp to

students of SMK Darussalam Karangpucung and SMK Negeri 1 Karangpucung, Indonesia¹⁶. Even though, in this study, the subjects admitted that they had difficulty avoiding snack foods, after being given education, 35.71% of the subjects succeeded. The results of this study are not following the results of research on providing nutrition education online via WhatsApp for 18 days with a frequency of every two days, which has increased knowledge significantly, and there have been changes in attitudes and actions even though is not significant¹². An increase in subject knowledge can be triggered by receiving information through infographics during the intervention because the brain directly processes the information. There was no difference in attitude in the study because attitudes were difficult to change quickly. In addition, attitudes are also influenced by personal experience and emotional factors. The results of these studies indicate that forming one's eating habits is affected by nutritional knowledge and plays a role in shaping perceptions, beliefs, attitudes, values, and motivation.⁷ The development of beliefs, feelings, interpretations, attitudes, and meanings influence the formation of one's food selection behavior³⁰.

On the contrary, which only used audio media to see an increase in students' nutritional knowledge at SD Muhammadiyah 4 Kandang sapi²³. This research provides education on balanced nutrition through WhatsApp with three different media, namely audio media, digital posters, and stop motion videos, to increase knowledge and positive changes in menu selection in food delivery applications. Giver's example of nutrition education on WhatsApp can be seen in Figure 2. Generally, previous studies used printed posters to provide education, such as research conducted to see an increase in student's knowledge and attitudes at SDN Ploso Surabaya about nutrition²⁵. Providing nutrition education to students at SDN 16 Samarinda is also limited to using video media²⁶. Thus, this research can be carried out flexibly without being limited by distance and time. Besides that, the delivery of nutrition education with media through the WhatsApp group is suitable for teenagers because WhatsApp is a popular social media¹⁴, the delivery of nutrition education with audio media, digital posters, and stop motion videos that have been developed can attract the attention of teenagers with sound and moving images.



Figure 2. An example of providing nutrition education in the Whatsapp group

CONCLUSIONS

In this study, all intervention groups experienced increased knowledge about balanced nutrition. This study also showed a positive change in menu selection in food delivery applications. There was no difference in the effectiveness of audio, poster, and video media in this study. The implementation of nutrition education needs to be carried out gradually and continuously with more frequent frequency to increase understanding of balanced nutrition and the selection of nutritionally balanced menus. In addition, it is necessary to assess the level of acceptance of educational media by subjects to improve the quality of educational media.

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