DEVELOPMENT OF NUTRITION EDUCATION MEDIA USING VIDEO ABOUT KNOWLEDGE OF SNACK SELECTION AMONG ADOLESCENTS

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ABSTRACT

Background: Adolescents aged 13-18 years experience rapid growth, leading to increased nutritional needs. This age group often seeks additional snacks outside of meal times due to heightened appetite. However, not all snacks are nutritious. Another issue is the low food safety level of snacks sold freely in school canteens and the surrounding environment, which may not meet adolescents' nutritional needs. This study aims to develop, determine the suitability, and assess the acceptability of video-based nutrition education media about adolescent snack selection.

Method: This research utilized the Research and Development (R&D) method, encompassing analysis, design, development, implementation, and evaluation stages. The subjects included material experts, media experts, and target audience acceptability tests. The research object was video media.

Results: The media suitability test by material experts averaged 4.37, with a CVI of 1.00. Media experts rated it at 4.47 with a CVI of 0.96. The acceptability test scored an average of 4.5 with a CVI of 1.00.

Conclusion: The video media is highly suitable and highly suitable for use as an information tool to increase knowledge about snack selection among adolescents.

Keywords: Adolescents; Snacks; Video Media

INTRODUCTION

Adolescents aged 13-18 years experience rapid growth, leading to increased nutritional needs. During this age, increased appetite often drives them to seek additional snacks outside of regular meal times (Laenggeng & Lumalang, 2015). Street food or snacks found at schools or workplaces can supplement the main nutritional needs (Rachmawati, 2020). Snack foods are an alternative to fulfill nutritional needs that come from main foods, which can be obtained from snack foods (Rakhman & Taufiqurrahman, 2018). The need for snack food contributions varies in each age group, according to Rachmawati's research results (2020) in adolescents aged 13-18 years, the percentage contribution of snacks per day is an average of 30.5% energy,

3.3% protein, 9.2% fat, and 15.7% carbohydrates. However, frequent consumption of low-nutrition snacks like meatballs, *batagor*, sausages, and *siomay* can lead to increased body fat and obesity (Abulyatama, 2021). These snacks are often high in calories, salt, and fat, and may contain additives (preservatives, colorings, artificial sweeteners, and flavor enhancers) (Sutrisno et al., 2018).

Another issue is the low food safety level of snacks sold in school canteens, which may not meet adolescents' nutritional needs (Laenggeng & Lumalang, 2015). BPOM in Semarang reported in 2018 that 0,975% of 718 snack samples from 24 cities/districts contained harmful food additives. Moreover, unfit snacks can cause food poisoning. According to BPOM RI, Indonesia has about 20 million food

poisoning cases annually (Dwinanda, 2019). This phenomenon is related to the lack of knowledge regarding the choice of snack foods. Information regarding the selection of snacks can be found on various social media platforms.

Adolescents often seek information through social media (Pilgrim & Bohnet-Joschko, 2019), significantly influencing food choice behavior (Nabi et al., 2019). Video is a widely utilized educational medium due to its audio-visual nature, making it an effective educational tool (Mukti et al., 2022). It can clarify and simplify the material for adolescents, avoid boredom, and facilitate peer-to-peer dissemination of information (Safitri & Fitriani, 2016). In line with that, research by Lubis et al (2022) with the title "Development of animated video media based on the Canva application to increase student motivation and learning achievement" showing media feasibility validation results averaging 65.45% invalid criteria according to media experts. Expert validation aims to determine the feasibility and identify the weaknesses of educational media. Expert validation provides an assessment of the references or indicators contained in the validation instrument by expert validation (Silmi & Rachmadyanti, 2018).

Given the importance of validated media, this study aims to develop, determine the suitability, and assess the acceptability of a video about snack selection knowledge for adolescents.

METHODS

This media development research employs the Research and Development (R&D) method, adapting analysis, design, development, implementation, and evaluation (the ADDIE model). The subjects included three material experts, three media experts, and ten adolescents for the acceptability test. The criteria for subject selection are shown in Table 1.

Table 1. Research Subject Criteria

Subject	Criterion
Material Expert	• Minimum bachelor's degree in Nutrition Science • Work as a lecturer, or nutritionist in hospitals, health offices or health centers, and other health agencies.
Media Expert	• Minimum bachelor/diplomat graduates in the field of visual communication design, animation, and multimedia • Work as a teacher, or freelancer in video maker, video editor, and other visual communication design fields.
Goal	• Teens aged 13-18 • Domicile Salatiga

The research object is an audio-visual product, a nutrition education video about snack selection knowledge for adolescents. The media development aims to understand the process, suitability, and effectiveness of the media validated by experts and tested for acceptability by the target audience. The media was developed using Canva and Wondershare Filmora 11.8.0. This research has passed ethical clearance by the FK UMS Ethics Committee with No. 4788/B.2/KEPK-FKUMS/X/2023.

Data collection was qualitative and quantitative. Qualitative data were obtained from questionnaires filled out by material experts, media experts, and the target audience for the acceptability test. Quantitative data were converted from the results of the qualitative questionnaire using the formula shown in Table 2.

Development Of Nutrition Education Media Using Video About Knowledge Of
Snack Selection Among Adolescents
Qori' Selviana Putri, Luluk Ria Rakhma

2024

Table 2. Convert categories to value

Criteria (Qualitative)	Value Range (Quantitative)
Highly Suitable	$> Mi + 1,5\,SBi$
Suitable	$Mi + 0,5\,SBi \leq s.d < Mi + 1,5\,SBi$
Adequate	$Mi - 0,5\,SBi \leq s.d < Mi + 0,5\,SBi$
Less Suitable	$Mi - 1,5\,SBi \leq s.d < Mi - 0,5\,SBi$
Highly Unsuitable	$< Mi - 1,5\,SBi$

The qualitative data were converted into quantitative values by calculating the Mi and SBi. The Mi value is a calculation of the average ideal score using a formula $(Mi) = 1/2$ ✘ (maximum ideal score + minimum ideal score), while SBi is the ideal standard deviation which is calculated using the formula $(SBi) = \frac{1}{6}$ ✘ (maximum ideal score + minimum ideal score).

Furthermore, The validity content was tested using the Content Validity Ratio (CVR), ranging from -1.00 to +1.00, where higher values indicate better validation. The CVR is calculated as follows:

$$CVR = \frac{2ne}{N} - 1$$

Description:
ne = Number of experts who stated suitable/very suitable
N = Number of experts who conducted the assessment

After identifying a statement item on the instrument using CVR, then calculate the average of the overall CVR using CVI (Content Validity Index) using the Lawshe formula (1975):

$$CVI = \frac{\Sigma CVR}{n}$$

Description:
CVR = Content Validity Ratio
n = Number of test items

The CVI value obtained is then interpreted according to the provisions of the Lawshe listed in Table 3.

Table 3. Interpretation of CVI values

CVI Value	Category
0 – 0,33	Not Suitable
0,34 – 0,67	Suitable
0,68 – 1,00	Highly Suitable

RESULTS AND DISCUSSION

The video development about adolescent snack selection utilized the ADDIE model: analysis, design, development, implementation, and evaluation.

Analysis Stage

A preliminary study, including a literature review, was conducted in the analysis stage. The literature review results included: 1) The Ministry of Health of the Republic of Indonesia (2018) report on adolescent nutritional status related to eating behavior and snack selection; 2) Research by Sari & Rachmawati (2020) on snack contribution to daily energy intake; 3) BPOM Semarang reported in 2018 on low food safety levels; 4) The effectiveness of video media as an educational tool validated by media experts (Silmi & Rachmadyanti, 2018).

Design Stage

The design stage utilized Canva and Wondershare Filmora 11.8.0, involving three phases: 1) Pre-production, including content outline, storyboard, and casting & recording; 2) Production, involving animation creation, background setting, icon and character arrangement, and motion graphics; 3) Post-production, combining animations with sound effects, background music, voice-over, and subtitles, followed by rendering to produce an mp4 format video.

Development Stage

The development stage involves creating the media product designed in the previous stage and conducting

validation tests to assess the suitability of the developed media.

3.1. Creating the Video Media Product

The creation of the product refers to the detailed content, the GBIM, and the storyboard that has been designed using the Canva application with a canvas size of 120 x 1080 pixels. It is rendered using Wondershare Filmora 11.8.0 into a media product in mp4 format.

3.2. Expert Validation and Media Suitability

In this stage, the suitability of the media is assessed by three material experts and three media experts. This aims to identify deficiencies in the media product, followed by revisions made by the researcher based on the experts' suggestions before conducting the target audience acceptability test.

3.2.1. Results of Material Expert Validation Test

Overall, the material expert validation test received an average score of 4.37, categorized as "suitable." The CVI value was calculated to be 1.00, categorized as "highly suitable" as shown in table 4.

Table 4. Results of the Material Expert Validation Test

No	Statement	Validators			Average	Information	CVR
		1	2	3			
1.	The material presented is in accordance with the theory of nutrition science	4	4	5	4.33	Suitable	1
2.	The material presented in the form of video media is easy to understand	4	4	5	4.33	Suitable	1
3.	The use of Indonesian is in accordance with the level of development of the user or target	4	4	5	4.33	Suitable	1
4.	Media makes it easier for the target to understand the material	4	4	5	4.33	Suitable	1
5.	The material presented is easy to understand	4	4	4	4	Suitable	1
6.	The animations presented are easy to understand	4	4	5	4.33	Suitable	1
7.	The use of Indonesian in accordance with the rules of the language	4	4	5	4.33	Suitable	1
8.	The material presented is complete	4	4	4	4	Suitable	1
9.	Materials are displayed clearly	4	4	4	4	Suitable	1
10.	Animations look clear or unambiguous	4	4	5	4.33	Suitable	1
11.	The material presented is complete	4	4	5	4.33	Suitable	1
12.	Communicative language	4	4	5	4.33	Suitable	1
13.	The material presented was in full swing	4	4	5	4.33	Suitable	1
14.	Materials with suitable media titles	5	4	5	4.67	Highly Suitable	1
15.	Educational media helps increase the knowledge of teenagers	5	4	5	4.67	Highly Suitable	1
16.	The material presented with educational purposes is suitable or conveyed	5	4	5	4.67	Highly Suitable	1
17.	References or sources of material used are clear	5	4	5	4.67	Highly Suitable	1
18.	Media can attract the attention of teenagers	4	4	5	4.67	Highly Suitable	1
19.	Media can be used at any time	5	4	5	4.67	Highly Suitable	1
	Overall average				4.37	∑CVR	19

Development Of Nutrition Education Media Using Video About Knowledge Of
Snack Selection Among Adolescents
Qori' Selviana Putri, Luluk Ria Rakhma

2024

The conclusion from the material expert validation test is that the video media product is "suitable and highly suitable" for use as a medium for knowledge about snack selection among adolescents.

3.2.2. Results of Media Expert Validation Test

Based on Table 5, the average score from the media expert validation test was 4.47, categorized as "suitable." The CVI value was calculated to be 0.96, categorized as "highly suitable." Therefore, the conclusion from the media expert validation test is that the video media product is "suitable and highly suitable" for use as a medium for knowledge about snack selection among adolescents.

Table 5. Results of the Media Expert Validation Test

No.	Statement	Validators			Average	Information	CVR
		1	2	3			
1.	The quality of the displayed screen (background) is good	4	4	5	4.33	Suitable	1
2.	The text displayed is clearly readable	5	5	5	5	Highly Suitable	1
3.	The background color does not cover the text	4	5	5	4.67	Highly Suitable	1
4.	Efficient use of images and text	3	4	5	4	Suitable	1
5.	Sounds are heard clearly	5	5	5	5	Highly Suitable	1
6.	The intonation of the conversation is in accordance with the material discussed	5	5	4	4.67	Highly Suitable	1
7.	The material used does not have a double/ambiguous meaning	4	5	5	4.67	Highly Suitable	1
8.	Selection of suitable backsound	4	4	5	4.33	Suitable	1
9.	Consistent layout display (e.g. university logo layout)	3	4	4	3.67	Suitable	1
10.	The quality of the displayed video is usable (clear or not blurry)	4	5	5	4.67	Highly Suitable	1
11.	The flow of the conversation or material is interesting so that it is not boring	2	5	5	4	Suitable	0.33
12.	Media can be used at any time	5	5	5	5	Highly Suitable	1
13.	The medium is easy to use or apply	4	5	5	4.67	Highly Suitable	1
14.	Media helps increase youth knowledge regarding the material displayed	3	5	5	4.33	Suitable	1
15.	The video duration is dense or not wordy	3	4	5	4	Suitable	1
16.	The quality of the images presented is attractive or eye-catching	4	4	5	4.33	Suitable	1
17.	The cast is in accordance with the material presented	4	5	5	4.67	Highly Suitable	1
18.	Video media with educational materials correlate	4	5	5	4.67	Highly Suitable	1
19.	The media presented is not boring so that it can attract the attention of teenagers	3	5	5	4.33	Suitable	1
	Overall Average				4.47	∑CVR	18.33

Implementation and Evaluation Stage

The implementation stage aims to conduct an acceptability test on the target audience. The subjects included a minimum of 10 adolescents aged 13-18 years residing in Salatiga, Semarang Regency. This small-scale acceptability test determines adolescents' acceptance of the developed media product. The

data from the target audience acceptability test is demonstrated in Table 6.

Table 6. Results of Target Acceptance Test

No.	Statement	Goal										Average	Information	CVR
		1	2	3	4	5	6	7	8	9	10			
1.	I can use this educational medium easily	3	4	4	5	4	5	5	3	5	5	4.2	Suitable	1
2.	I easily understand the language used	4	5	5	5	5	5	4	4	4	5	4.7	Highly Suitable	1
3.	This media adds to my knowledge about the selection of snack food	5	5	5	5	4	5	4	4	5	5	4.6	Highly Suitable	1
4.	I easily remember the material displayed	5	4	3	4	5	5	4	5	4	4	4.6	Highly Suitable	1
5.	I can use this medium at any time	3	4	5	4	5	4	4	4	4	4	4.5	Suitable	1
6.	I understand the content of the material presented	5	5	4	5	4	5	5	4	4	5	4.7	Highly Suitable	1
7.	Interesting educational media	4	5	5	5	5	5	4	4	5	5	4.3	Suitable	1
8.	I don't get tired of using this educational media	4	5	5	5	5	5	5	5	4	5	4.1	Suitable	1
9.	I am happy and satisfied with using this educational media	4	5	5	4	4	4	4	4	4	5	4.5	Suitable	1
10.	I am motivated to choose healthy snack foods after using this medium	5	5	5	4	4	4	4	5	5	5	4.8	Highly Suitable	1
	Overall average											4.5	∑**CVR**	10

Based on Table 6, the overall average score from the target audience acceptability test was 4.5, categorized as "suitable." The CVR value was calculated to be 10.00, resulting in a CVI value of 1.00, categorized as "highly suitable." The conclusion from the target audience acceptability test is that the video media product is "suitable and highly suitable" for use by adolescents as a means to increase their knowledge about snack selection.

CONCLUSION

Based on the assessment results by material experts, media experts, and the target audience acceptability test, it is evident that the video media on knowledge of snack selection among adolescents scored 4.52, falling into the "highly suitable" category. Furthermore, the CVI value, averaging 0.69, is categorized as "highly suitable." Therefore, it can be concluded that the developed video media product is suitable for use as a medium for adolescents to increase their knowledge about snack selection. The limitations of this study include the lack a broad scope of snack selection material, resulting in not all material being included in the video media product. Suggestions for future

Development Of Nutrition Education Media Using Video About Knowledge Of
Snack Selection Among Adolescents
Qori' Selviana Putri, Luluk Ria Rakhma

2024

researchers are that this media product can still be utilized by comparing it with other references, such as the impact or relationship between snack foods and this media product.

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CONFLICT OF INTEREST

This research has no conflict of interest.

REFERENCES

Abulyatama, U. (2021). Jurnal Aceh Medika. *Saufa Yarah*, *9623*(2), 36–46.

Dwinanda, R. (2019). *Ada 20 Juta Kasus Keracunan di Indonesia*. Republika.Co.Id.

Kementrian Kesehatan Republik Indonesia/Kemenkes RI. (2018). Laporan_Nasional_RKD2018_FINAL.pdf. In *Badan Penelitian dan Pengembangan Kesehatan* (p. 674).

Laenggeng, A. H., & Lumalang, Y. (2015). Hubungan Pengetahuan Gizi Dan Sikap Memilih Makanan Jajanan Dengan Status Gizi Siswa SMP NegerI 1 Palu Pendahuluan Remaja golongan usia 13-18 tahun terjadi pertumbuhan yang sangat cepat sehingga kebutuhan gizi untuk pertumbuhan dan aktivitas meningkat , g. *Jurnal Kesehatan Tadulako Vol.1 No.1*, *1*, 49–57.

Mukti, Z. H., Rusilanti, R., & Yulianti, Y. (2022). Pengembangan Media Edukasi Berbasis Video Animasi 3 Dimensi Tentang Makanan Berserat Untuk Meningkatkan Konsumsi Serat Pada Remaja. *Jurnal Health Sains*, *3*(3), 593–606.

Nabi, R. L., Huskey, R., Nicholls, S. B., Keblusek, L., & Reed, M. (2019). When audiences become advocates: Self-induced behavior change through health message posting in social media. *Computers in Human Behavior*, *99*, 260–267.

Pilgrim, K., & Bohnet-Joschko, S. (2019). Selling health and happiness how influencers communicate on Instagram about dieting and exercise: Mixed methods research. *BMC Public Health*, *19*(1), 1–9.

Safitri, N. R. D., & Fitriani, D. Y. (2016). Pengaruh Edukasi Gizi Dengan Ceramah Dan Booklet Terhadap Peningkatan Pengetahuan Dan Sikap Gizi Remaja Overweight. *Journal of Nutrition College*, *vol 5*, 374–380.

Sari, Y. D., & Rachmawati, R. (2020). Kontribusi Zat Gizi Makanan Jajanan Terhadap Asupan Energi Sehari Di Indonesia (Analisis Data Survey Konsumsi Makanan Individu 2014) [Food Away From Home (Fafh) Contribution of Nutrition To Daily Total Energy Intake in Indonesia]. *Penelitian Gizi Dan Makanan (The Journal of Nutrition and Food Research)*, *43*(1), 29–40.

Silmi, M. Q., & Rachmadyanti, P. (2018). Pengembangan Media Pembelajaran Video Animasi Berbasis Sparkol Videoscribe Tentang Persiapan Kemerdekaan RI SD Kelas V. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar*, *06*(04), 486–495.

Sutrisno, Pratiwi, D. C., Istiqomah, Baba, K. J., Rifani, L. E., & Ningtyas, M. A. (2018). Edukasi Bahaya Junk Food (Makanan dan Snack) dan Jajan Sembarangan dikalangan Remaja. *Journal of Community Engagement in Health*, *Vol. 1*

Tiadeka, P., Solikhah, D. M., & Karimah, M. (2022). Identifikasi Kimia Serta Gambaran

Pengetahuan Siswa Terhadap Boraks, Formalin dan Rhodamine-B Pada Jajanan Di SMA Muhammadiyah 1 Gresik. *Ghidza: Jurnal Gizi Dan Kesehatan*, *6*(1), 80–93.