



Interactive Nutrition Education Using Animated Videos and Puzzles Improves Fruit and Vegetable Nutrition Knowledge Among Elementary School Children

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Abstract

Background: Low consumption of fruits and vegetables in elementary school children is at risk of causing health and nutrition problems in the future, one of which is due to lack of nutritional knowledge. Nutrition education from an early age is needed as a preventive effort, and the use of interactive media such as animated videos and puzzles is considered effective in increasing children's understanding of the importance of fruit and vegetable consumption. The purpose of this study is to analyze the effectiveness of nutrition education through interactive media in the form of animated videos and puzzles on the knowledge of fruit and vegetable consumption in elementary school children.

Methods: The study used a quasi-experimental design with a pretest-post test non-equivalent control group design. The 54 students were divided into experimental and control groups. The experimental group was educated using animated videos and puzzles, while the control group used the lecture method. Data analysis used Independent Sample t-Test, Paired Sample t-Test and N-Gain test. **Results:** Results showed a significant increase in knowledge in the experimental group ($p = 0.000$) compared to the control ($p = 0.054$), with moderate effectiveness based on the N-Gain value (0.5854 or 58.54%).

Conclusion: Nutrition education with interactive media of animated videos and puzzles is effective in significantly increasing the knowledge of fruit and vegetable consumption in elementary school children, and can be an interesting educational strategy and in accordance with the learning characteristics of children of that age.

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INTRODUCTION

Fruit and vegetable consumption is an essential component in the implementation of a healthy diet based on the principle of balanced nutrition. Fruits and vegetables provide vitamins, minerals, fiber, and antioxidants that play a role in preventing chronic diseases early and forming healthy eating habits throughout life (Woodside et al., 2023). According to WHO (2021), low consumption of fruits and vegetables is among the top ten risk factors for deaths globally (Darmawan et al., 2023). A WHO report estimates that low fruit and vegetable intake causes around 1.7 million deaths each year (Okop et al., 2019). In addition, lack of fruit and vegetable consumption is also associated with 14% of gastrointestinal cancer cases, 11% of ischemic heart disease, as well as 9% of strokes, diabetes, and other cardiovascular diseases (Tachi et al., 2020). Fruit and vegetable consumption, which is below the WHO recommendation, which is 400 grams or five servings day, is still a significant global nutrition issue, both in developed and developing countries. This condition becomes more worrying in the group of school-age children. The average daily consumption of fruits and vegetables for children aged 5–14 years in the Southeast Asian region is only 182 grams, far below the WHO standard (Hanifa et al., 2020). In Indonesia, data from the 2023 Survey Kesehatan Indonesia (SKI) shows that 96.7% of the population still consumes less fruits and vegetables, with the prevalence in the primary school age group reaching 97.7%. This figure has increased from 96.8% in 2018 (Kemenkes, 2018). Jawa Tengah Province is among the top ten provinces with the lowest prevalence of fruit and vegetable consumption in the population aged ≥ 5 years, which is 90.7% based on RISKESDAS 2013. The prevalence increased to 94.7% in 2018 (Kemenkes, 2018), and rose again to 96.2% based on SKI data in 2023 (SKI, 2023). The problem of lack of fruit and vegetable consumption can occur in all age groups, including elementary school children (Ervika Meiliana Rikiartika, 2024; Ilić et al., 2022). Children in this phase tend to choose foods based on taste preferences, so they often ignore the consumption of fruits and vegetables (Kähkönen et al., 2021). In fact,

elementary school age is a critical phase in children's growth and development. During this period, children need a balanced nutritional intake that includes vitamins, minerals, and fiber, to support optimal physical and cognitive development. Eating habits formed during this period will also affect children's consumption patterns in adolescence and adulthood (Mahmood et al., 2021).

The low consumption of fruits and vegetables in children is influenced by various factors, both internal and external. One of the main causes is the lack of nutritional knowledge and the lack of educational media that is interesting and in accordance with the characteristics of children (Dianah et al., 2021). The Ministry of Health of the Republic of Indonesia (2022) emphasizes the importance of nutrition promotion through the Communication, Information, and Education (KIE) approach aimed at families and children. Research Zalfaa Aziizah Firdaus & Tati Ruhmawati (2021) It also revealed that low levels of knowledge are closely related to unhealthy consumption behaviors. Therefore, fun and contextual educational methods are needed so that nutritional information can be optimally received by elementary school-age children. In the period of concrete operational cognitive development, children tend to understand information more easily through visual approaches and direct activities. Various studies show that interactive media is more effective in increasing knowledge than lecture methods. Study by Hasanica et al (2020) recorded a significant increase in nutritional knowledge after education using audiovisual media and posters. Similar things were also found by Zalfaa Aziizah Firdaus & Tati Ruhmawati (2021) who reported that animated video media was able to increase children's understanding of the importance of fruit and vegetable consumption.

The problem of lack of fruit and vegetable consumption was also found in students at SDN Petompon 2 Semarang. Based on a preliminary study conducted on 27 students at SDN Petompon 2 related to knowledge of fruit and vegetable consumption, the results were obtained as many as 77.7% of students obtained quite low results and as many

as 22.2% of students had good knowledge related to fruit and vegetable consumption. The implementation of nutrition education activities will be recognized by taking respondents in grade 4, with the reason that grade 4 elementary school students, who are generally aged 9–10 years, are at the stage of concrete operational cognitive development. At this stage, they are able to understand the concepts conveyed through visual and interactive media.

Based on this background, this study aims to analyze the effectiveness of nutrition education through interactive media in the form of animated videos and puzzles on the knowledge of fruit and vegetable consumption in elementary school children.

RESEARCH METHODS

The research design

This research uses a design quasi-experiments with a plan pretest-posttest non-equivalent control group. The research was carried out on grade IV students at SDN Petompon 2, Semarang, during the period from April 29 to June 2, 2025. The experimental group was given an intervention in the form of nutrition education using animated videos and Puzzle, while the control group was given nutrition education through conventional methods in the form of lectures.

Research Samples and Procedures

The number of respondents in this study was 54 grade IV students. Sample calculation using the formula Lemeshow With an additional dropout reserve of 10%, 27 respondents were obtained for the experimental group and the control group respectively. The sampling technique was carried out non-randomly with the purposive sampling.

The inclusion criteria include grade IV students who are active, willing to participate in the entire series of research activities, and present at the pre-test and post-test. Meanwhile, the exclusion criteria are students who are not present during the research process.

The research was conducted in three stages: (1) the pre-research stage; (2) the research stage; and (3) post-research stage. All data were collected directly and analyzed using parametric and non-parametric statistical tests

according to the data distribution, including the calculation of N-Gain scores to assess the effectiveness of the intervention.

The pre-research stage includes administrative and technical preparation, such as title endorsement, preliminary studies, preparation and testing of the validity and reliability of instruments, validation of educational media, and management of ethics and implementation permits. The instruments used consisted of pre-test and post-test questionnaires, as well as educational media in the form of animated videos and puzzles.

The implementation stage was carried out for three weeks. In the first week, grade IV students of SDN Petompon 2 were given an explanation related to the purpose, benefits, and procedures of the research, followed by filling out informed consent and implementing a pre-test by the experimental and control group. The second week was an intervention: the experimental group received education through an animated video, followed by a puzzle-making game and a question and answer session; while the control group received education by the lecture method. Sessions are held twice per week with different schedules for each group and a duration of about 30 minutes according to school time. The post-research phase took place in the third week with the implementation of a post-test to evaluate changes in knowledge after the intervention.

Research Instruments

The instrument used in this study was a knowledge questionnaire about fruit and vegetable consumption consisting of 20 multiple-choice questions. The questionnaire has gone through a material feasibility test conducted by 2 nutrition lecturers at Universitas Negeri Semarang by filling out a material feasibility assessment questionnaire. Meanwhile, the validity and reliability test was carried out at SDN Petompon 1 which was not used as a research location. The knowledge score is calculated based on the number of correct answers, then categorized into three: good, adequate, and poor. In addition, other instruments used in this study are nutrition education media in the form of interactive media, animated videos sourced from youtube

videos of the Indonesian Ministry of Health, and puzzles designed and made by themselves have gone through a media feasibility test by media experts consisting of lecturers of public health and nutritional psychology at S Universitas Negeri Semarang by filling out a media feasibility assessment questionnaire.

Research Variables

The Independent variables in this study are interactive media, nutrition education, animated videos, and puzzles. Dependent variables are to knowledge of fruit and vegetable consumption. Knowledge was measured using pre-test and post-test in both groups.

Statistical Analysis

The data were analyzed using the SPSS version 26 program. The analysis included a normality test (Shapiro-Wilk) and a homogeneity test (Levene's Test), a Paired t-test and an Independent t-test as well as an N-Gain test to measure the effectiveness of knowledge enhancement.

Ethical Considerations

This research has obtained permission from the ethical feasibility commission of the Faculty of Medicine, Semarang State University and obtained permission from the school and consent from students in the form of informed consent. Before filling out the informed consent, all participants or respondents were given an explanation regarding the objectives, objectives of the research, and the duration of the research. All respondents' data is kept confidential and is only used for academic purposes.

RESULTS AND DISCUSSIONS

Characteristics of respondents

This study involved two groups of respondents, namely the experimental group and the control group, each consisting of 27 grade IV elementary school students. The majority of respondents in both groups were 10 years old, with a percentage of 81.5% in the experimental group and 77.8% in the control group. Based on gender, most of the respondents were women, namely 63% in the experimental group and 55.6% in the control group.

Table 1. Respondent characteristics

Respondent Characteristics	Experimental Group		Control Group	
	N	Percentage(%)	N	Percentage(%)
Age				
9	3	11,1%	0	0%
10	22	81,5%	21	77,8%
11	2	7,4%	6	22,2%
Sum	27	100%	27	100%
Gender				
Man	10	37%	12	44,4%
Woman	17	63%	15	55,6%
Sum	27	100%	27	100%

Frequency Distribution of Knowledge and Independent Sample T-Test Before and After Intervention of Experimental and Control Groups

Based on Table 2, the distribution of knowledge levels of fruit and vegetable consumption before intervention in the experimental and control groups was dominated by the categories of sufficient and deficient. In the experimental group, most respondents had a level of knowledge in the categories of less(48.1%), enough (40.7%) and good (11.1%). Meanwhile, in the control group, the majority

of respondents were in the categories of fair (40.7%), less (37%), and good (22.2%).

The results of the statistical test using the independent sample t-test showed a significance value of 0.729 ($p > 0.05$), which indicated that there was no significant difference in the level of knowledge of fruit and vegetable consumption between the two groups before the intervention was carried out. This is reinforced by the relatively similar average knowledge scores of the two groups. Thus, it can be concluded that the initial condition of knowledge in both groups is in a comparable state, so that

the educational interventions provided can be analyzed objectively on post-treatment changes in knowledge.

Based on the results of the Independent Sample t-Test analysis of the post-test score, a significance value of 0.000 ($p < 0.05$), which indicates a significant difference between the experimental group and the post-intervention

control. The average post-test score in the experimental group was higher than that of the control group, which shows that nutrition education interventions using interactive media in the form of animated videos and puzzles are more effective in improving knowledge compared to the lecture method.

Table 2. Knowledge Frequency Distribution and Independent Sample T-Test Before and After Experimental Group Intervention and Control Group

Group	Know- ledge	Pre-test N	Pre-test (%)	Mean	Sig. (2-tailed)	P- Value	Post-test N	Post-test (%)	Mean	Sig. (2-tailed)	P- Value
Eksperimen	Good	3	11,1%				20	74,1%			
	Enough	11	40,7%	60,74	,729		7	25,9%	84,44	,000	
	Less	13	48,1%				0	0%			
	Sum	27	100%			0,05	27	100%			0,05
Control	Good	6	22,2%				5	18,5%			
	Enough	11	40,7%	62,04	,729		15	55,6%	64,07	,000	
	Less	10	37%				7	25,9%			
	Sum	27	100%				27	100%			

Knowledge Distribution and Paired Sample T-Test Before and After Intervention of Experimental and Control Groups

Based on Table 3, data analysis using the Paired Sample t-Test statistical test in the control group resulted in a significance value of 0.054 ($p > 0.05$), indicating that there was no significant difference between pre-test and post-test scores in the group. In addition, the average pre-test and post-test scores showed minimal changes, with a relatively small difference in scores. These findings indicate that providing nutrition education through the lecture method did not have a significant

impact on improving knowledge in the control group. Meanwhile, the results of the paired sample t-test analysis in the experimental group showed a significance value of 0.000 ($p < 0.05$), which showed that there was a significant difference between the pre-test and post-test values. This indicates that there is a significant increase in knowledge of fruit and vegetable consumption after educational interventions using interactive media, animated videos, and puzzles. This increase is also reflected in the difference in the average score of the pre-test and post-test which shows a considerable difference.

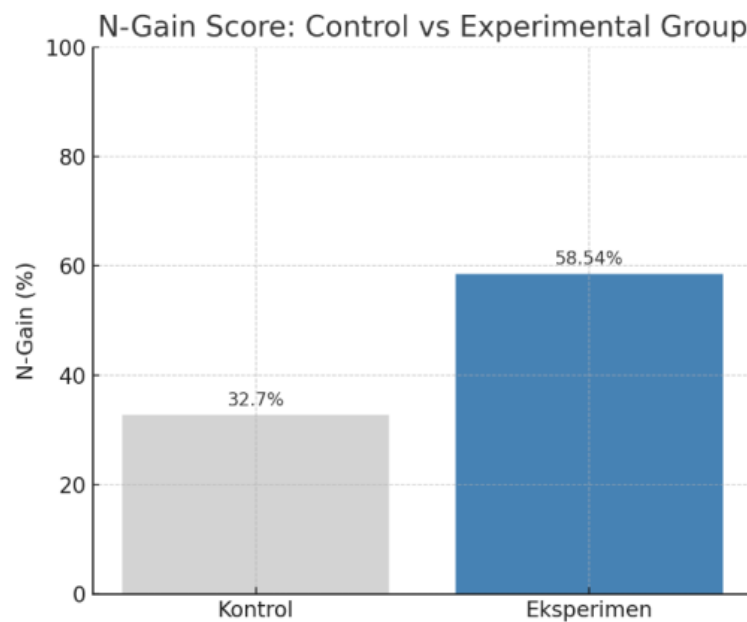
Table 3. Knowledge Distribution and Paired Sample T-Test Before and After Experimental Group Intervention and Control Group

Class	Knowledge	N	Mean	Sig. (2-tailed)	P-Value
Control	Pre-test	27	62,04	,054	
	Post-test	27	64,07		0,05
Eksperimen	Pre-test	27	60,74	,000	
	Post-test	27	84,44		

Effectiveness of N-Gain-Based Interventions

The N-Gain test was conducted to assess the effectiveness of knowledge improvement after nutrition education interventions using interactive media. Based on figure 1, the results of the calculation using SPSS version 26 show that the average value of N-Gain in the

experimental group is 0.5854. This value is in the medium category, which shows that the nutrition education interventions provided are quite effective in increasing knowledge of fruit and vegetable consumption. In addition, the average N-Gain score in percentage of 58.54% further supports that the use of interactive



Picture 1. N-gain Percent of Control Group and Experimental Group

media of animated videos and puzzles provides a significant increase in knowledge in elementary school students. Meanwhile, the N-gain value of the control group was 0.03 and the N-gain percent was 32.70%, which shows that the nutrition education provided was ineffective or low.

A significant increase in knowledge about fruit and vegetable consumption occurred in the experimental group after being given nutrition education interventions using interactive media in the form of animated videos and puzzles. This finding was strengthened by the results of the Paired Sample t-Test which showed a significance value of 0.000 ($p < 0.05$), with an average post-test score that was higher than the pre-test. In contrast, in the control group that received education through the lecture method, there was no significant increase in knowledge, indicated by a significance value of 0.054 ($p > 0.05$). In addition, the results of the Independent Sample t-Test on the post-test scores of the two groups also showed a significant difference ($p = 0.000$), where the experimental group obtained a higher score than the control group.

Animated video is a type of educational medium that is designed to convey information or messages through a combination of sound and visual displays. This media is considered to be in accordance with the characteristics

of elementary school age children because it is able to stimulate the imagination and support learning activities in a fun atmosphere. The presentation of material in the form of interesting and easy-to-understand animations also plays a role in increasing children's learning motivation and facilitating the process of receiving information more effectively (Sulistiyan et al., 2022). Meanwhile, the media puzzle is an educational visual form composed of brightly colored pieces of images, designed to stimulate thinking skills, exercise patience, and develop social skills such as sharing (Puspitasari et al., 2024). These two media are easy to understand, interesting, and able to add insight, arouse motivation, and increase enthusiasm in learning, so that they indirectly contribute to increasing knowledge and forming individual attitudes.

The incorporation of interactive educational media in the form of animated videos and puzzle proven to be able to increase children's interest and interest in the learning process. The respondents in this study were between the ages of 9-11 years, which cognitive development was included in the concrete operational stage according to Piaget's theory (Rabindran & Madanagopal, 2020). At this stage, the child begins to be able to understand simple logical concepts and gain optimal

understanding through visual approaches and hands-on experience (Hayat et al., 2024). This condition is relevant to the interventions provided in the research, namely interactive media in the form of animated videos and Puzzle, which combines visual, auditory, and motor activity elements. The compatibility between the age characteristics of the respondents and the form of intervention used was one of the factors that supported a significant increase in knowledge in the experimental group after nutrition education was provided. This is also in line with research conducted by Sapphire et al (2021) which states that the use of interactive media as a nutrition counseling medium is able to increase knowledge, this is evidenced by the results of knowledge before counseling by 5% in the good category and increased to 85% in the good category.

In contrast, lecture methods tend to be passive and less actively involve students. This may explain why the control group did not experience a meaningful increase in knowledge after the intervention. Even though the material presented is the same, the form of presentation has a great influence on the absorption and interest of students. These findings also show that the use of interactive media of animated videos and Puzzle can significantly increase students' knowledge compared to conventional lecture methods. This is in line with research Wongprawmas et al (2023) stated that nutrition education with audiovisual media is effective in improving the understanding of elementary school students. Moreover Zalfaa Aziizah Firdaus & Tati Ruhmawati (2021) also reported that the use of animated videos provided significant results in increasing knowledge about fruit and vegetable consumption in elementary school students. The similarity of these results shows the consistency of the effectiveness of visual and interactive media in children's nutrition education. Interactive media such as animated videos and puzzle allowing students to receive information in a more engaging and enjoyable way. Animated videos convey information visually and audilogically, while puzzle involves motor activity and simple problem-solving that can strengthen the understanding of concepts

related to fruit and vegetable consumption. Research conducted by Abdollahi et al (2021) mentioned that providing education by involving motor activities significantly increases knowledge related to nutrition.

Test results N-Gain In the experimental group, a score of 0.5854 or 58.54% indicated that the provision of nutrition education to the experimental group used interactive media, animated videos, and puzzle have moderate or moderately effective effectiveness in increasing knowledge of fruit and vegetable consumption in elementary school children (Mailintina et al., 2022).

The results of this study provide an idea that nutrition education interventions that are creatively designed and in accordance with the characteristics of the child's age can improve students' understanding more effectively. These findings can be the basis for schools and health workers in designing nutrition education programs that are more interesting and interactive, for example through the integration of learning media in the UKS program or health promotion activities in schools. However, this study has some limitations. The short observation time does not allow to evaluate long-term behavioral changes. In addition, the scope of the study covered only one school, so the results could not be generalized widely. Therefore, it is recommended to conduct follow-up research with a wider coverage of areas as well as follow-up measurements of changes in fruit and vegetable consumption behavior in the long term.

CONCLUSION

Overall, the results of the study show that nutrition education uses interactive media in the form of animated videos and puzzle It has been proven to be effective in significantly increasing the knowledge of fruit and vegetable consumption in elementary school children. This effectiveness is shown through the results of the test Paired Sample t-Test, Independent t-Test, and test N-Gain, all of which show a significant increase in knowledge as well as a fairly effective level of effectiveness of the interactive media used.

REFERENCES

- Abdollahi, A. M., Masento, N. A., Vepsäläinen, H., Mijal, M., Gromadzka, M., & Fogelholm, M. (2021). Investigating the Effectiveness of an Educational Escape Game for Increasing Nutrition-Related Knowledge in Young Adolescents: A Pilot Study. *Frontiers in Nutrition*, 8(May), 1–9. <https://doi.org/10.3389/fnut.2021.674404>
- Darmawan, E. S., Kusuma, D., Permanasari, V. Y., Amir, V., Tjandrarini, D. H., & Dharmayanti, I. (2023). Beyond the Plate: Uncovering Inequalities in Fruit and Vegetable Intake across Indonesian Districts. *Nutrients*, 15(9), 1–13. <https://doi.org/10.3390/nu15092160>
- Dianah, R. D., Naufal Rosyidi, M., & Adhanuraina, A. (2021). Penyuluhan Pentingnya Konsumsi Buah Dan Sayur Pada Masa Pandemi Covid-19 Di Sdi Al-Azhar 2 Jakarta. *Jurnal Abdimas ADPI Sains Dan Teknologi*, 2(3), 108–116. <https://doi.org/10.47841/saintek.v2i3.236>
- Ervika Meiliana Rikiartika. (2024). Indonesian Journal of Public Health and Nutrition. *Indonesian Journal of Public Health and Nutrition*, 4(1), 61–69.
- Hanifa, A., Djokusujono, K., Triyanti, T., & Salimar, S. (2020). Konsumsi Buah-Sayur Pada Siswa Sma Negeri 81 Jakarta [The Consumption Of Fruits And Vegetables Among Students Of Sma Negeri 81 Jakarta]. *Jurnal Penelitian Gizi Dan Makanan (The Journal of Nutrition and Food Research)*, 43(2). <https://pgm.persagi.org/index.php/pgm/article/view/665>
- Hasanica, N., Ramic-Catak, A., Mujezinovic, A., Begagic, S., Galijasevic, K., & Oruc, M. (2020). The Effectiveness of Leaflets and Posters as a Health Education Method. *Materia Socio-Medica*, 32(2), 135–139. <https://doi.org/10.5455/msm.2020.32.135-139>
- Hayat, F., Khan, M., Ahmad, S., Kamran, M., & Maleeha. (2024). Exploring the Characteristics of Concrete Operational Stage among Primary School Students. *Qlantic Journal of Social Sciences and Humanities*, 5(1), 124–132. <https://doi.org/10.55737/qjssh.786349315>
- Ilić, A., Rumbak, I., Brečić, R., Barić, I. C., & Bituh, M. (2022). *Increasing Fruit and Vegetable Intake of Primary School*.
- Kähkönen, K., Sandell, M., Rönkä, A., Hujo, M., & Nuutinen, O. (2021). Children's fruit and vegetable preferences are associated with their mothers' and fathers' preferences. *Foods*, 10(2), 1–14. <https://doi.org/10.3390/foods10020261>
- Kemenkes. (2018). Laporan Riset Kesehatan Dasar 2018 Nasional. pdf. In *Lembaga Penerbit Balitbangkes* (p. hal 156).
- Mahmood, L., Flores-Barrantes, P., Moreno, L. A., Manios, Y., & Gonzalez-Gil, E. M. (2021). The influence of parental dietary behaviors and practices on children's eating habits. *Nutrients*, 13(4), 1–13. <https://doi.org/10.3390/nu13041138>
- Mailintina, Y., Panjaitan, R. S., Ludovikus, Saragih, D. B., Dachliana, Utami, W. A., Nurhadi, R. S., & Putri, M. (2022). Bersih Dan Sehat Bersama: Meningkatkan Kesadaran Kesehatan Siswa Melalui Perilaku Hibup Bersih Dan Sehat (Phbs). *Jurnal Pengabdian Kepada Masyarakat*, 6(1), 45–49. <https://ejournal.iaifa.ac.id/index.php/JPM/article/view/485>
- Okop, K. J., Ndayi, K., Tsolekile, L., Sanders, D., & Puoane, T. (2019). Low intake of commonly available fruits and vegetables in socio-economically disadvantaged communities of South Africa: Influence of affordability and sugary drinks intake. *BMC Public Health*, 19(1), 1–14. <https://doi.org/10.1186/s12889-019-7254-7>
- Puspitasari, I., Indanah, Sukesih, Rohim, D. C., Jauhari, M. A., & Ridwan, A. (2024). Peningkatan Kesehatan Keluarga Melalui Pemberdayaan Masyarakat Dengan Cara Mengurangi Sampah dan Meningkatkan Manfaat Sampah Menjadi Edukasi dan Dakwah. *Jurnal Abdimas Indonesia*, 4(2022), 167–173.
- Rabindran, & Madanagopal, D. (2020). Piaget's Theory and Stages of Cognitive Development- An Overview. *Scholars Journal of Applied Medical Sciences*, 8(9), 2152–2157. <https://doi.org/10.36347/sjams.2020.v08i09.034>
- Safitri, Y. L., Sulistyowati, E., & Ambarwati, R. (2021). Pengaruh Edukasi Gizi Dengan Media Puzzle Terhadap Pengetahuan Dan Sikap Tentang Sayur Dan Buah Pada Anak Sekolah Dasar. *Journal of Nutrition College*, 10(2), 100–104. <https://doi.org/10.14710/jnc.v10i2.29139>
- SKI. (2023). Indonesian Health Survey (Survei Kesehatan Indonesia) 2023. Ministry of Health, 1–68.
- Sulistiyan, M. F. D., , Ns. Noerma Shovie Rizqiea., M. K., Karunia, N. I., & Mustikarani, M. K. (2022). *Pengaruh Edukasi Kesehatan Menggunakan Video Animasi Tentang Konsumsi Buah Dan Sayur Terhadap Pengetahuan Dan Sikap Anak Obesitas*. 1–10.

- <http://eprints.ukh.ac.id/id/eprint/3210/>
- Tachi, K., Tetteh, J., Yawson, A. E., Agyei-Nkansah, A., & Archampong, T. (2020). Alcohol consumption and fruits and vegetable intake among older adults in Ghana: A cross-sectional survey based on WHO-SAGE Wave 2 data. *BMJ Nutrition, Prevention and Health*, 3(2), 220–228. <https://doi.org/10.1136/bmjnp-2020-000102>
- Wongprawmas, R., Xhakollari, V., Spadoni, R., Renner, B., & Canavari, M. (2023). Effect of multimedia interventions on children's fruit and vegetable consumption in a real-life setting. *Young Consumers*, 24(1), 40–55. <https://doi.org/10.1108/YC-05-2022-1519>
- Woodside, J. V., Nugent, A. P., Moore, R. E., & Mckinley, M. C. (2023). Fruit and vegetable consumption as a preventative strategy for non-communicable diseases. *Proceedings of the Nutrition Society*, 186–199. <https://doi.org/10.1017/S0029665123002161>
- Zalfaa Aziizah Firdaus, & Tati Ruhmawati. (2021). Pengaruh Media Video Animasi Tentang Konsumsi Buah Dan Sayur Terhadap Pengetahuan Siswa Sekolah Dasar. *Jurnal Kesehatan Siliwangi*, 2(1), 81–89. <https://doi.org/10.34011/jks.v2i1.644>