



THE INFLUENCE OF NUTRITIONAL EDUCATION THROUGH COMICS ON KNOWLEDGE AND ATTITUDES IN CHOOSING HEALTHY Snacks among Children at SDN 1 TRIMOHARJO, OKU TIMUR DISTRICT

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ABSTRACT

Unhealthy snacks are widely circulated in school environments and tend to have poor nutritional quality, but the majority of school children do not have enough knowledge in choosing snacks. This research aims to determine the effect of comic nutrition education on the level of knowledge and attitudes about healthy snacks in children. This research design uses designquasi experimental and pre-test and post-test with control group design. The sample for this study consisted of 58 respondents consisting of 29 respondents in the control group and 29 respondents in the experimental group. The analysis test used was the paired sample t-test with the results obtained, namely that there were differences in knowledge and attitude scores before and after the intervention in the control group ($P=0,000$) and in the experimental group ($P=0,000$). Then continued with the independent sample t-test with the results that there was a difference in knowledge scores between the control and experimental groups ($P=0.023$), and there was no difference in attitude scores between the control and experimental groups ($P=0,816$). The conclusion of this research is that there is an influence of nutrition education on the level of knowledge and attitudes about healthy snacks in children, both using comic media in the experimental group and leaflet media in the control group. Through this research, it can be suggested that comic media can be used as an alternative media for nutrition education regarding healthy snacks for elementary school age children.

Keywords: Healthy Snacks, Nutrition Education, Comics, Leaflets, Elementary School Age Children

Introduction

School age is a period when children experience a fairly rapid cycle of growth and development. Therefore, positive environmental support and balanced nutrition are needed by paying attention to the food consumed daily¹. In Indonesia, something that cannot be separated from school children is snacks. Snacking behavior in children can be said to be a distraction. Based on a survey conducted by BPOM, it shows that snacks contribute 31,1% of energy and 27,4% of protein.² The nutritional contribution of these snacks exceeds the recommendations for snacks, where according to the Food Security Agency in 2018 the recommended energy and protein intake in snacks is 20%³.

The characteristics of healthy snacks are that they are protected from animal sources of disease, dirt and dust, and the materials and tools used in the processing process are clean.⁴.Nurbiyati et al., (2014) says that a good and balanced nutritional composition must be

included in snacks for children. Apart from that, snacks should not contain preservatives, artificial colorings or unnecessary additives. As many as 60% of school children's snacks do not meet safety quality standards⁶. The low level of food safety for school children's snacks (PJAS) is an important problem⁷. The results of tests carried out by BPOM in January-August 2014, almost a third of school children's snacks in 23,500 primary schools and Madrasah Ibtidaiyah in Indonesia were contaminated with dangerous microbes, in addition it was also found that the use of dangerous ingredients and food additives (BTP) that did not meet the requirements, such as borax, formalin, and textile dyes⁵.

Snacks at school that are not guaranteed to be healthy can cause the risk of poisoning and digestive disorders which will result in malnutrition if it occurs in the long term. The negative impact that arises from the habit of consuming snacks too often is a decrease in appetite, the emergence of various diseases, causing obesity, wastage, and problems with dental health. Snack foods tend to be high in energy and simple carbohydrates. Foods that are high in energy if accompanied by a lack of physical activity will be stored as fat and will result in obesity³.

According to Pitriyanti, et al (2019) stated that the KLB (Extraordinary Event) of food poisoning in 2017 caused by snacks (24,53%) was in the second highest place after household cooking (37,74%). Meanwhile, based on the place of occurrence, educational institutions are also in second place after the place of residence with the highest incidence in the SD/MI strata⁸.

The dangers that can threaten the health of school-age children due to children's lack of understanding about healthy snacks need attention. Nutrition education in the school environment can be an alternative because it can influence children's knowledge, attitudes and behavior. An important factor in the success of a nutrition education program is the methods and media used during education. One of the media that can be used in nutrition education is comics. The comic method is an interesting method and tends to be liked by elementary school children⁹.

Methods

This research used a quasi-experimental design with a pre-test and post-test group design. This research was carried out in February 2023 at SDN 1 Trimoharjo, East Oku Regency. The sampling technique in this study used total sampling, namely all grade 4 and 5 students at SDN 1 Trimoharjo as many as 58 respondents with grade 4 as the control group and grade 5 as the experimental group. Meanwhile, each group is determined through a lottery method between the two classes. This research was carried out in 3 interventions over 3 weeks.

Results

Respondent Characteristics

Table 1. Characteristics of Respondents

| Characteristics | Group | | | | Total | |
|----------------------------|---------|------|------------|-------|-------|------|
| | Control | | Experiment | | N | % |
| | n | % | n | % | | |
| Gender | | | | | | |
| Man | 12 | 41,4 | 18 | 62,1 | 30 | 51,7 |
| Woman | 17 | 58,6 | 11 | 37,9 | 28 | 48,3 |
| Age | | | | | | |
| 10 years | 21 | 72,4 | 0 | 0 | 21 | 36,2 |
| 11 years old | 8 | 27,6 | 25 | 86,2 | 33 | 56,9 |
| 12 years old | 0 | 0 | 4 | 13,8 | 4 | 6,9 |
| Religion | | | | | | |
| Muslim | 27 | 93,1 | 29 | 100,0 | 56 | 96,6 |
| Non-Muslim | 2 | 6,9 | 0 | | 2 | 3,4 |
| Father's occupation | | | | | | |
| Farmer | 17 | 58,6 | 22 | 75,9 | 39 | 67,2 |
| Civil servants/teachers | 1 | 3,4 | 2 | 6,9 | 3 | 5,2 |
| Self-employed | 4 | 13,8 | 2 | 6,9 | 6 | 10,3 |
| Daily laborer | 6 | 20,7 | 0 | 0 | 6 | 10,3 |
| Doesn't work | 1 | 3,4 | 3 | 10,3 | 4 | 6,9 |
| Mother's Job | | | | | | |
| Farmer | 8 | 27,6 | 12 | 41,4 | 20 | 34,5 |
| Civil servants/teachers | 2 | 6,9 | 2 | 6,9 | 4 | 6,9 |
| Self-employed | 4 | 13,8 | 3 | 10,3 | 7 | 12,1 |
| Daily laborer | 2 | 6,9 | 3 | 10,3 | 5 | 8,6 |
| IRT | 13 | 44,8 | 9 | 31,0 | 22 | 37,9 |

Source: Primary Data, 2023

Based on the above, it shows that the number of respondents in the control group and experimental group was 29 people each. In the control group, the majority were female, namely 17 people (58,6%), while in the experimental group the majority were male, namely 18 people (62,1%). Age characteristics in the control group were mostly 10 years old, namely 21 people (72,4%), while in the experimental group most of them were 11 years old, namely 25 people (86,2%). In the control group and experimental group, the majority were Muslim, namely 27 people (93,1%) in the control group and 29 people (100%) in the experimental group. The work of fathers in each group was mostly as farmers with 17 people (58,6%) in the control group and 22 people (75,9%) in the experimental group. Meanwhile, most of the mothers' jobs in the control group were 13 housewives (44,8%), and most of the mothers' jobs in the experimental group were 12 people (41,4%).

Respondents' Knowledge

The results of the analysis of knowledge scores in the experimental group obtained an average value before intervention of 10,79. Meanwhile the average value after intervention was 13,17. The results of the average value show an increase in scores, which means that descriptively there is an average difference between the pretest score and the posttest score with an average

difference of 2,38. Meanwhile, based on the paired sample t-test, the p value was 0,000 (<0,05), so H₀ was rejected and H_a was accepted. So it can be said that there is a significant average difference between the pretest score and the posttest score, which means that there is an influence of the comic nutrition education intervention in increasing respondents' knowledge about healthy snacks in the experimental group.

Table 2. Analysis of Differences in Knowledge Scores Before and After Intervention

| Variable | Paired sample t-test | | | | |
|-----------------------------------|----------------------|---------|-----------------------------|-----|---------|
| | Mean | M in | Min elementary school | Max | P value |
| Control Group (Leaflet) | | | | | |
| Pretest | 10,52 | 6 | 2,68 | 15 | 0,000 |
| Post test | 11,83 | 6 | 1 2,26 | 15 | |
| Δ | 1,31 | | 9 | | |
| Experimental Group (Comic) | | | | | |
| Pre-test | 10,79 | 6 | 2,41 | 15 | 0,000 |
| Post test | 13,17 | 10 | 1 1,53 | 15 | |
| Δ | 2,38 | | 7 | | |

Table 3. Analysis of Differences in Mean Knowledge Scores Between Control and Experimental Groups

| Variable | Independent sample t-test | | |
|--------------------|---------------------------|-----------------------------|---------|
| | ΔMean | Min elementary school | P value |
| Control group | 1,31 | 1,491 | |
| Experimental group | 2,38 | 1,953 | 0,023 |

Table 3 shows the results of the independent sample t-test, which obtained a p value of 0,023 < 0,05, so H₀ is rejected and H_a is accepted. So it can be concluded that there is a significant difference in the average results of respondents' knowledge scores about healthy snacks between the control group who were given leaflet nutrition education and the experimental group who were given comic nutrition education.

Respondent's Attitude

Table 4 shows the results of the analysis of attitude scores in the control group. The average value before the intervention was 43,86, while the average value after the intervention was 48,89. The results of the mean value show an increase, which means that descriptively there is an average difference between the pretest score and the posttest score with an average difference of 4,73. Meanwhile, based on the paired sample t-test, the p value was 0,000 (<0,05), so H₀ was rejected

and H_a was accepted. So it can be said that there is a significant average difference between the pretest score and the posttest score, which means that there is an influence of leaflet nutrition education intervention in improving respondents' attitudes about healthy snacks in the control group.

Table 4. Analysis of Differences in Attitude Scores Before and After Intervention

| Variable | Paired sample t-test | | | | P value |
|-----------------------------------|----------------------|-----|-------------------|-----|---------|
| | Mean | Min | elementary school | Max | |
| Control Group (leaflet) | | | | | |
| Pretest | 43,86 | 32 | 8,083 | 59 | 0,000 |
| Post test | 48,59 | 36 | 6,593 | 60 | |
| Δ | 4,73 | | | | |
| Experimental Group (Comic) | | | | | |
| Pre-test | 46.83 | 34 | 6,000 | 60 | 0,000 |
| Post test | 51,90 | 42 | 5,690 | 60 | |
| Δ | 5,07 | | | | |

The results of the analysis of attitude scores in the experimental group showed that the average value before the intervention was 47,38, while the average value after the intervention was 51,90. The results of the mean value show an increase in scores, which means that descriptively there is an average difference between the pretest score and the posttest score with an average difference of 5,07. Meanwhile, based on the paired sample t-test, the p value was 0,000 ($<0,05$), so H_0 was rejected and H_a was accepted. So it can be said that there is a significant average difference between pretest scores and posttest scores, which means that there is an influence of comic nutrition education interventions in improving respondents' attitudes about healthy snacks in the experimental group.

Table 5. Analysis of differences in average attitude scores between the control and experimental groups

| Variable | Independent sample t-test | | |
|--------------------|---------------------------|--------------------------|------------|
| | Δ Mea n | ele mentary school | P value |
| Control group | 4,72 | 4,77 | 0,816 |
| Experimental group | 5,07 | 6,35 | |
| | | 2 | |

Table 5 shows the results of the independent sample t-test, which obtained a p value of 0,816 $> 0,05$, so H_0 is accepted and H_a is rejected. So it can be concluded that there is no significant difference between the average scores of respondents' attitudes about healthy snacks between the control group who were given leaflet nutrition education and the experimental group who were given comic nutrition education.

Discussion

Respondents' Knowledge

This research shows that leaflet and comic media both have an influence on increasing children's knowledge about healthy snacks. According to experts, it is stated that what transmits the most knowledge to the brain is the sense of sight, namely approximately 75% to 85%. Therefore, it can be concluded that visual tools can make it easier to receive the information or educational material presented¹⁰. Knowledge can increase or increase with information using various types of media, namely print media and electronic media¹¹. The results of the analysis in the groups given comic media and those given leaflet media showed that there was a significant difference in the average knowledge score between before and after the intervention.

The results of this research are in line with research from Yanti et al (2020) shows that the results of the bivariate analysis of knowledge scores show that the p value is $0,000 < 0,05$, which means there is a difference in knowledge between before and after being given counseling using the leaflet method. The average knowledge before the intervention was 8,8 and after the intervention was given it increased by 9,8. Based on these results, it can be said that giving leaflets can increase knowledge. In line with Fleur's theory which states that mass media is part of the source of information that can influence a person's level of knowledge¹².

Increased knowledge occurred after intervention with comic media in this study in line with Research by Ridho et al (2018) regarding the influence of comic media on eye health knowledge in children, suggests that based on the paired t test, it shows a p value of $0,000 < 0,05$, which means there is a significant difference after health education was carried out with comic media, so it can be concluded that Comics have an influence on students' knowledge. This could be because the images presented in educational comics are in the form of cartoons which are liked by children¹³.

This research shows that comic media is more effective in influencing increasing knowledge compared to leaflet media. This is because the comic media used in this research is easy to understand and presented in everyday language and the stories in the comics created are events experienced by students every day. The choice of bright images and colors in comics makes students more motivated to read them. The differences in the responses given from the two groups were also different, where the experimental group looked more enthusiastic when given comics compared to the group given leaflets.

Extension media equipped with interesting stories and pictures will attract students to receive information clearly. This is in accordance with research Hamida (2012) which shows that there was an increase in students' knowledge after being given counseling about the safety of snacks in lecture groups using comic media. The results of the analysis of differences in initial and final

knowledge obtained a p value of 0,001, these results indicate that there is a significant difference in initial and final knowledge in the lecture group using comic media.¹⁴

The images in comics function as illustrations of stories that are appropriate to the material discussed, and the colors in comics also attract children's interest in reading. Meanwhile, the material presented through conversations from characters in comics helps children's understanding. According to Hubeis (1993), counseling with simple sentences and more pictures can be more easily accepted at low levels of education¹³.

The results of this study showed that there was an improvement in attitudes after the intervention was carried out using both leaflets and comics. Attitude is a very important concept in the socio-psychological component, because it is a tendency to act and perceive. One of the factors that influences attitude formation is the influence of other people who are considered important. A person's attitude can also be influenced by internal factors, namely psychological and physiological. Meanwhile, external factors are interventions that come from outside such as counseling, education and counseling¹⁵.

The results of the analysis carried out between the control and experimental groups in this study show there were no significant differences in attitudes. This could be because both groups both use media that convey messages visually. So the respondents' ability to receive information is almost the same. Presenting nutritional information and education will be more effective through print media in the form of visual messages, and consisting of a number of words and images with color combinations. Comics and leaflets are print media that can be considered effective for nutrition education¹⁶.

This research is in line with research from Samsiana and Sulandjari (2023) also stated that the influence of the use of educational media on attitudes obtained a p value of $0.262 > 0.05$, so it can be said that there is no difference in the influence of the use of Android-based comic educational media and leaflet educational media on attitudes. This is because the lack of interaction between educators and students can cause the stimulation in forming attitudes to be less than optimal¹⁷.

Kusumarani, et al (2018) also stated that there was no difference in improving attitudes about vegetables and fruit between the treatment group that was given education using comic media and the control group that was given lecture education without comic media with a p value of $0.100 > 0.05$. This is because the comic media used is not integrated with the characters in the figures who are used as good examples worth emulating, so that students cannot be involved emotionally and indirectly cannot instill values and attitudes.¹⁸ Instilling character in education can have a positive impact on a person's emotional development, spirituality and personality. Apart from that, character can also develop habits in better attitudes and behavior¹⁹.

Attitude is a person's closed response to a particular object. Changing attitudes is not easy and takes quite a long time. Attitudes are formed from 3 components, namely cognitive, affective

and conative, which are a system that cannot be separated from each other. Factors forming attitudes are personal experience, culture, mass media, educational institutions, religious institutions, and emotional factors. This research shows that there is no significant difference between the control and experimental groups in the intervention with comic and leaflet media. This can happen because students' emotions and beliefs change. Apart from that, it could also be caused by the information conveyed through nutrition education not being well received so that children are still hesitant and confused in answering questions¹⁸.

Conclusion

In this study it can be concluded that comic and leaflet media both have a significant influence on respondents' knowledge and attitudes, however, between comic and leaflet media there is no difference in improving attitudes. So comic media is stated to be more effective in increasing knowledge about healthy snacks in children. Suggestions for future researchers are that in preparing comic stories, it would be better to involve more characters as good examples and worthy of emulation so that children can be involved emotionally and can indirectly instill values and attitudes. Apart from that, it is hoped that comic media can be used as an alternative media for nutrition education.

References

1. Savitri, A. et al. Early Education on Healthy Eating Culture for MI MUhammadiyah Delektukang Students.1, (2022).
2. Nuryani, N. & Rahmawati, R. Snack habits are related to the nutritional status of school children in Gorontalo Regency. *J. Indonesian Nutrition. (The Indonesian. J. Nutr.*6, 114–122 (2018).
3. Anggiruling, DOet al. Factor Analysis of Snack Choice, Nutritional Contribution and Nutritional Status of Primary School Students Factors Analysis of Snack Choice, Nutritional Contribution and Nutritional Status of Primary School Children. *J. MKMI* 15, 81–90 (2019).
4. Rahmi, S. How to Choose Healthy Snacks and the Negative Effects That Caused by Consuming Unhealthy Snacks for Elementary School Children. *Pros. Semin. Nas. Has. Devotion. 2018 WAY*260–265 (2018).
5. Nurbiyati, T. et al. The importance of choosing healthy snacks for children's health 1. 3, 192–196 (2014).
6. Febriani, K. et al. The Influence of Health Education on Increasing Knowledge in Selection of Snacks in School Age Children 7-9 Years, Ngantru Village, Ngantang District, Malang

- Regency.3, 481–491 (2018).
7. Selinaswati, EF The Role of Schools in Anticipating Food Poisoning from School-Pjas Children's Snacks (Case Study of Three Elementary Schools in Air Freshwater, East Padang, West Sumatra). (2017).
 8. Damat, D., Tain, A., Siskawardani, DD & Winarsih, S. Education of School Children's Snack Food Traders in Malang Regency, East Java.*J. Masy. Independent*10, 20–55 (2020).
 9. Hartono, N. et al. Nutrition Education About Knowledge of Choosing Healthy Snacks between Lecture Method and Comic Method.*2*, 76–84 (2015).
 10. Nubatonis, MO & Ayatulah, MI Dental Health Promotion Using Leaflet Media on Knowledge, Attitudes, Dental and Oral Hygiene Status.*J. Health. Tooth*6, 147–156 (2019).
 11. Fauziah, AN, Maesaroh, S. & Sulistyorini, E. Use of Leaflets to Increase Knowledge About Breast Self-Examination.*Gaster*15, 204 (2017).
 12. Yanti, E. afrida, Hasibuan, Y., Batubara, A. & Siregar, Y. Effectiveness of Leaflet Media Extension and Lecture Methods on the Knowledge and Attitudes of Female Students Regarding Early Marriage at SMAN 1 Pancur Batu Deli Serdang in 2019.*COLOSTRUM J. Obstetrics*1, 25–34 (2020).
 13. Ridho, A., Pradana, TD, Pradana, TD, Mayarestya, NP & Mayarestya, NP The Influence of Comic Media on Eye Health Knowledge in Children.*J. Health Vocational*.3, 1–6 (2018).
 14. Hamida, K. et al. Nutrition Education using Comic Media to Increase knowledge about Snack Food Safety.*8*, 67–73 (2012).
 15. Mardiana, Nilawati, NS & Eliza. The Influence of Lecture and Leaflet Method Nutrition Counseling on Students' Snack Choosing Behavior at State Elementary School, Sako Village, Palembang 2012.*J. Health*.1, 17–23 (2013).
 16. Rustiarini, FSA, Ibnu Malkan Bakhrul Ilmi, Sintha Fransiske Simanungkalit & Nanang Nasrullah. The Effectiveness of Educational Comics and Leaflets in Increasing the Knowledge of Parents of Elementary School Students Regarding Phbs to Prevent Transmission of the COVID-19 Virus.*J. Nutrition and Health*.13, 66–85 (2021).
 17. Samsiana, Danti Latifah; Sulandjari,S. The Effect of Using Android-Based Comics in Education about Vegetables and Fruit on the Knowledge and Attitudes of Elementary School Age Children in Grades 4 and 5 in Tlogo Village, Blitar Regency. (2023).
 18. Kusumarani, A., Noviardhi, A. & Susiloretni, KA The Influence of Comic Media on Knowledge and Attitudes About Vegetables and Fruit at Aisyiyah Elementary School and Kalicilik 2 Elementary School, Demak.*J. Ris. Nutrition*6, 46 (2018).
 19. Ulfah, T. Strengthening Student Character Education through the Digital Literacy Movement in Junior High Schools.*Pros. Semin. Nas. Educator*.727–736 (2020).