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# Increasing Consumption of Vegetables and Fruits in Students Using Comic and Leaflet: A Quasy Experimental

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## ABSTRACT

**Introduction:** Education on the consumption of vegetables and fruits with comics and leaflets is given in the hope that knowledge and action on students will change food consumption, especially vitamins, minerals and fiber can increase. The problem of research is the comparison of the knowledge and actions of elementary school students before and after being educated with comics and leaflets in the consumption of vegetables and fruit.

**Aims:** This study compares the knowledge and actions of students given the media namely comics and leaflets to buy vegetables and fruit.

**Methodology:** This research is a quantitative study using a quasi-design experimentation by designing a Nonequivalent Control Group. The population in study on 140 people, with the sample 110 people, 55 samples in SDN 122 Pinrang as an intervention group and 55 samples in SDN 218 Pinrang as a control group.

**Results:** The results showed that no one opposed knowledge between groups (p=0.576) while the action variable, there were differences between groups (p=0.000). The importance of collaboration between schools and local health centers on the importance of consumption of vegetables and fruits.

**Keywords:** *Education, Vegetables, Fruits*

## INTRODUCTION

Fruit and vegetables are sources of vitamins and minerals that help bodily organs work and function more smoothly. Several non-communicable diseases arise due to insufficient consumption of vegetables and fruits such as obesity (obesity), diabetes mellitus, anemia, vitamin deficiency, hypertension, coronary heart disease, and stroke (Parry, 2010). In 2016, the Central Statistics Agency (BPS) conducted a survey of vegetable and fruit consumption.

The results of the survey show that the consumption of vegetables and fruit for the Indonesian population is 173 grams per day, lower than the Nutrition Adequacy Rate (RDA) of 400 grams per day in South Sulawesi province in 2018 (Ministry of Health, 2016). Based on Riskesdas data, the prevalence of eating less vegetables and fruits is at aged 10-14 years as many as 96.8% who eat vegetables and fruit less than 5 servings/ day in a week

(Riskesdas, 2018). This age is a phase of child growth and development which is strongly influenced by the amount and intake of nutrients. Pinrang as a district or city in South Sulawesi with a low level of consumption of vegetables and fruit aged 10-14 years, namely 93.4% who consume less vegetables and fruit every day (Riskesdas, 2007). Another study also conducted by Sukmawati, et al in 2016 revealed that the level of student consumption of vegetables and fruit in Pinrang was still lacking, as many as 56.7% of children consumed vegetables and 58.3% who consumed fruit (Sukmawati, 2016).

Research conducted by Hermina and Prihatini in 2016, revealed that providing education to students using media is a fairly effective way to increase knowledge (Hermina, 2016). As for the research that compares the effectiveness of providing information through the BKKBN version of comics with leaflet media, the results obtained show that the knowledge and attitude of the comic treatment group is higher than that of the leaflet treatment group. The statistical test results obtained that the knowledge range for comics was 51.51 and leaflets was 60.82, while the attitude range for comics was 84.46 and leaflets were 37.26 (Handayani, 2010). Based on this description, the authors are interested in knowing the comparison of education with comics and leaflets on the behavior of elementary school students in consuming vegetables and fruit.

## METHODS

### *Research Design and Participants*

This type of study combines A Nonequivalent Control group design and A Quasi-Experimental methodology. The research was conducted at SDN 122 Pinrang and SDN 218 Pinrang from 09 March to 13 April 2019.

### *Location*

The population in this study were students of SDN 122 Pinrang and 140 students of SDN 218 Pinrang. The sample as many as 110 people with sampling with simple random sampling method.

### *Data Procedures and Analyst*

Sources of data are obtained from primary data, namely data about students' knowledge and actions on vegetable and fruit consumption, related research to support primary data. The instrument used in data collection is a research questionnaire, with media tools, namely comics, leaflets and food pictures. The data that has been collected was then analyzed using the Wilcoxon signed ranks test (same group) and the Mann Whitney test (between groups) using the SPPS application. Data presentation is presented in tabular form accompanied by narration.

## RESULTS AND DISCUSSION

**TABLE 1:** Distribution of Respondents by Gender and Age of Students

| **Gender/** | | **SDN 122** | | | **SDN 218** | |
|---|---|---|---|---|---|---|
| Age | n | | % | n | | % |
| Man | 23 | | 45.1 | 28 | | 54.9 |
| Woman | 28 | | 54.9 | 23 | | 45.1 |
| 10 years | 20 | | 39.2 | 19 | | 37.3 |
| 11 years old | 17 | | 33.3 | 14 | | 27.5 |
| 12 years old | 14 | | 27.5 | 18 | | 35.3 |
| Total | 55 | | 100 | 55 | | 100 |

The study's findings revealed the characteristics of respondents depending on age and gender. Of the 51 respondents to students at SDN 122 Pinrang, 23 people (45.1%) were male and 28 (54.9%) were female. As for the students of SDN 218 Pinrang, there were 28 people (54.9%) male and 23 (45.1%) female. The age of respondents from 51 students of SDN 122 Pinrang, more at the age of 10 years, namely 20 people (39.2%) and less at the age of 12 years, namely 14 people (27.5%). Meanwhile, SDN 218 Pinrang mostly

aged 10 years, namely 19 people (37.3%) and slightly 11 years old, namely 14 people (27.5%).

**TABLE 2:**Knowledge Level Value Change Consumption of Vegetables and Fruits at SDN 122 Pinrang (Intervention)

| Test Group | Knowledge | Min | Max | SD mean ± | p Nilai value |
|---|---|---|---|---|---|
| Pre-Post 1 | Pre | 1 | 6 | 3,2± 1.1 | <0.00 |
| (O1 - O2) | Post 1 | 2 | 7 | 5.1± 1.2 | |
| Post 1-Post 2 | Post 1 | 2 | 7 | 5.1± 1.2 | 0.16 |
| (O2 - O3) | Post 2 | 1 | 7 | 4.7± 1.4 | |
| Pre-Post 2 | Pre | 1 | 6 | 3,2± 1.1 | <0.00 |
| (O1 - O3) | Post 2 | 1 | 7 | 4.7± 1.4 | |

*Wilcoxon Signed Rank Test = 0.05

Changes in the level of knowledge pre-test and post-test at SDN 122 Pinrang showed that there was an increase in respondents' knowledge, which was an average of 3.2 to 5.1. Based on the as indicated in the table of Wilcoxon test findings, there is a difference between respondents' knowledge of fruit and vegetable intake between pre-test and post-test 1, where p = 0.000 0.05 in pre-test and post-test 1. This suggests that H0 is rejected. p = 0.16 > 0.05, hence H0 is accepted. The results of post-test 1 and post-test 2 indicated that the respondent's knowledge had declined, from an average of 5.1 to 4.7. H0 is acknowledged; hence it can be deduced that post-test 1 and post-test 2 respondents' knowledge of vegetable and fruit consumption is the same. The measurement of pre-test and post-test 2 showed that there was an increase in respondents' knowledge after getting comic media, an average of 3.2 to 4.7. The results of the Wilcoxon test analysis show that the p value = < 0.000 then H0 is rejected. There is a difference in respondents' knowledge about the consumption of vegetables and fruit at the time of giving the pretest with the post-test 2.

**TABLE 3:** Knowledge Level Value Change Consumption of Vegetables and Fruits at SDN 218 Pinrang (Control)

| Test Group | Knowledge | Min | Max | SD mean ± | p Nilai value |
|---|---|---|---|---|---|
| Pre-Post 1 | Pre | 0 | 5 | 3,2± 1,2 | <0.00 |
| (O1 - O2) | Post 1 | 2 | 7 | 4.8± 1.4 | |
| Post 1 Post 2 | Post 1 | 2 | 7 | 4.8± 1.4 | 0.74 |
| (O2 - O3) | Post 2 | 2 | 7 | 4.8± 1.1 | |
| Pre-Post 2 | Pre | 0 | 5 | 3,2± 1,2 | <0.00 |
| (O1 - O3) | Post 2 | 2 | 7 | 4.8± 1.1 | |

*Wilcoxon Signed Rank Test = 0.05

There is a difference in knowledge between pre and post 1 with an average r of 3.2 to an average of 4.8, according to changes in the pre-test and post-test knowledge levels at SDN 218 Pinrang. There was a difference in the respondents' knowledge of fruit and vegetable consumption at the time of pre-test and post-test 1, according to the Wilcoxon test analysis results, which revealed that the value of p = 0.000 0.05 in the pre-test and post-test 1. H0 was thus rejected. In the measurement post-test 1 and post-test 2 showed that there was no decrease or increase in respondent's knowledge, namely an average of 4.8 and post-test 1 an average of 4.8. The results of the Wilcoxon test analysis showed that the p value = 0.74> 0.05, then H0 was accepted, hence it can be deduced that post-test 1 and post-test 2 respondents' knowledge of vegetable and fruit

intake is the same. Following receipt of comic media, there was an increase in respondents' knowledge that ranged from an average of 3.2 to 4.8, according to the assessment of pre-test and post-test 2. The Wilcoxon test analysis findings indicate that H0 is not accepted when the value of p = 0.000. As a result, there was a discrepancy between respondents' knowledge of fruit and vegetable consumption at the time of the pretest and the post-test 2.

**TABLE 4:** Action Value Change Consumption of Vegetables and Fruits at SDN 122 Pinrang (Intervention)

| Test Group | Knowledge | Min | Max | SD mean ± | p Nilai value |
|---|---|---|---|---|---|
| Pre-Post 1 | Pre | 0 | 5 | 2,3± 1.1 | <0.07 |
| (O1 - O2) | Post 1 | 0 | 7 | 2.9± 1.4 | |
| Post 1 Post 2 | Post 1 | 0 | 7 | 2.9 ± 1.4 | 0.015 |
| (O2 - O3) | Post 2 | 1 | 5 | 3.7 ± 1.3 | |
| Pre-Post 2 | Pre | 0 | 5 | 2,3 ± 1.1 | <0.000 |
| (O1 - O3) | Post 2 | 1 | 5 | 3.7 ± 1.3 | |

*Wilcoxon Signed Rank Test = 0.05

After receiving health education media, such as comic books, the intervention group's respondents' behavior changed from 2.3 to 2.9. According to the Wilcoxon test analysis results table, H0 is acceptable if the p value is 0.07 or below. It is evident that the respondent's activities in consuming fruit and vegetables at the time of the pre-test and post-test 1 were the same. According to the measures from post-test 1 and post-test 2, the average number increased from 2.9 to 3.7. When the Wilcoxon test analysis revealed that H0 was rejected with a p value of 0.015, 0.05. This indicates that the respondent's behavior towards the eating of fruits and vegetables at the time of administering post-test 1 and post-test 2 varied. The average of the measurements from 2.3 to 3.7 was used to measure pre-test and post-test 2. According to the Wilcoxon test results table, H0 is not accepted since the p value is 0.000 or less than 0.05. It indicates that the respondent's behavior regarding the eating of fruits and vegetables at the time of administering the pre-test and the post-test 2 differs.

**TABLE 5:** Action Value Change Consumption of Vegetables and Fruits at SDN 218 Pinrang (Control)

| Test Group | Knowledge | Min | Max | SD mean ± | p Nilai value |
|---|---|---|---|---|---|
| Pre-Post 1 | Pre | 0 | 5 | 2,3 ± 1.2 | <0.74 |
| (O1 - O2) | Post 1 | 0 | 5 | 2.5 ± 1.2 | |
| Post 1 Post 2 | Post 1 | 0 | 5 | 2.5 ± 1.2 | 0.791 |
| (O2 - O3) | Post 2 | 0 | 5 | 2.4 ± 1.1 | |
| Pre-Post 2 | Pre | 0 | 5 | 2,3 ± 1.2 | <0.846 |
| (O1 - O3) | Post 2 | 0 | 5 | 2.4 ± 1.1 | |

*Wilcoxon Signed Rank Test = 0.05

After receiving flyers for health education, respondents in the control group changed their behavior from 2,4 to 2,5. The Wilcoxon test analysis results showed that H0 was accepted when the p value was 0.74 or greater and greater than 0.05. Therefore, there was no difference between the respondent's behavior when administering the pre-test and the post-test 1 regarding their consumption of fruits and vegetables. The average respondent's actions in the post-test 1 and post-test 2 assessments ranged from 2.5 to 2.4. The Wilcoxon test analysis

results indicate that H0 is accepted when the value of p = 0.791 > 0.05. It may be concluded that the respondent's behavior towards the eating of fruit and vegetables at the time of giving post-test 1 and post-test 2 was the same. The average respondent's actions at the pre-test and post-test 2 were 2, 3, and at the post-test 2, it was 2.4, according to the measurements. According to the Wilcoxon test results, the respondent's actions towards the consumption of fruits and vegetables at the time of administering the pre-test and the post-test 2 were the same (p = 0.846 > 0.05).

According to Notoatmodjo in 2010 argues that several factors that may affect the level of knowledge of a person, one of which is gender and age (Notoatmodjo, 2010). In this study, the characteristics of respondents based on gender were higher for girls than boys for SDN 122 Pinrang, while at SDN 218 Pinrang there were more boys than girls. According to the findings of the Bryan et al. 2019 study, while boys in the intervention group consumed significantly more healthy foods than those in the control group, the difference between girls and boys was much smaller. Girls continued to receive the control intervention for the stated reason that boys were less interested in the nutrition-focused classroom education intervention that addressed health and calories (Bryan et al., 2019).

In Bezbaruah et al., a similar pattern was seen in which, both before and after the intervention, more girls than boys consumed green beans. The average number of green beans ingested by girls post-intervention did not drop despite the larger number of green beans they consumed, even if the average amount of green beans consumed by males fell post-intervention (as more boys tried fewer green beans). girls try green beans as well (Bezbaruah et al., 2013). The primary obstacle to the eating of fruits and vegetables is a lack of interest, particularly among those under the age of ten. This circumstance shows that the age group of 10 to 12 years is among those whose consumption of fruits and vegetables is reported to be lower and still not in line with the framework of a balanced diet (Rubio-López et al., 2016). The nutritional intake itself is also a factor that impacts a person's nutrition, and the impact of nutritional intake on human health is significant (Rubio-López et al., 2016).

Low food intake in children is influenced by knowledge and actions. Knowledge is the result of a person's sensing of a particular object through the senses. Knowledge will be maximized if there is an increase in the intensity of one's attention to a particular object (Bryan et al., 2019). Unhealthy consumption, Preschool obesity among children from low-income homes is most likely a result of low consumption of fruits and vegetables and high consumption of empty calories (MacKinnon et al., 2014). In an effort to combat childhood obesity, efforts have been made to boost the consumption of healthful foods in children (Rolls et al., 2004).

When reading comics and leaflets, students sense the media. Sensing media presented in picture illustrations, and triggering a stimulus to remember the health message conveyed. The children's interest in reading comics and leaflets affected the respondents' knowledge of vegetables and fruit. While the usage of cartoon characters has frequently been cited as a contributing factor to youngsters developing harmful eating habits, the strategy appears especially pertinent for promoting healthy eating, particularly the consumption of fruits and vegetables. In this context, the goal of our cross-cultural research investigation was to determine how much 8 to 11-year-old children's opinions of cucumber packaging and readiness to eat these snacks were influenced by cartoon characters connected to health or flavor-related claims in snack veggies (Hémar-Nicolas et al., 2021).

According to the research, it illustrates fruit and vegetable consumption through the use of comic books and pamphlets. Both schools' collective knowledge increased. In the intervention group, knowledge increased from a low pre-test presentation to a high at post-test 2 after receiving health media, whereas in the control group, knowledge increased from a low pre-test presentation to a high at post-test 2. It is well established that accepting and wanting to try vegetables has good effects on vegetable consumption. This includes becoming familiar with and eating veggies when they are presented (Blissett & Fogel, 2013).

According to Notoatmodjo in 2007 said that actions can be divided into three levels based on

their quality, namely: guided practice (guided response). Guided practice is someone who has been able to do something but still uses a guide or guidance. This means that after receiving education, students still need guide books on choosing healthy and nutritious foods and then being able to practice them. A successful intervention strategy can focus on altering adult behavior in pre-school children's homes and daycare facilities. Preschool nutrition may be improved, at-risk children can be targeted, and adults can be educated through interventions aimed at parents and preschool educators. The potential of childcare services as an intervention setting is recognized by federal attempts to increase nutrition requirements in pre-school (Larson et al., 2011). It might be difficult to encourage kids to sample and then routinely consume fruit and vegetables. According to studies, youngsters between the ages of 5 and 11 might consume more fruits and vegetables when they are modeled after cartoon characters (Lynch et al., 2014). Behavior change is more likely when children engage in realistic and experience-based activities (Ortega et al., 2020).

Meanwhile, Vegetable Education Resources to Increase Children's Acceptance and Preference, a new educational initiative for Australian primary schools, was created with the goal of positively encouraging kids to consume vegetables. It is a vegetable-focused experiential learning curriculum that combines sensory education components with research-based understandings of how children come to embrace vegetables, such as exposure and modeling (Laureati et al., 2014). Dovey and colleagues came to the conclusion that children's food consumption may be influenced by health food advertising (Dovey et al., 2011).

The development of dietary preferences and choices can be explained in terms of exposure, social learning, and associative learning, according to the developmental systems perspective. The food choice developmental model emphasizes the crucial significance of learning through the observation of important role models (Boyland & Halford, 2013). However, the Theory of Planned Conduct asserts that [a person's behavioral intention is a function of his or her attitude toward the behavior and the perceived social pressure (subjective norm) to engage in that behavior (Mennella & Bobowski, 2015). There was an increase in respondents in both schools, both in consumption of vegetables and fruit. This can be seen by the changes in students in the act of consuming vegetables and fruit. The researcher concludes that changes in students' increased consumption of vegetables and fruit are influenced by the media provided, namely comics and leaflets. In the research conducted by Astuti, it was also revealed that changes in actions occurred through the provision of health education (Astuti, 2014)

## CONCLUSION

Post-test 1 to post-test 2 for each group showed evidence of an improvement in knowledge between the intervention group and the control group, with a p value of 0.00, according to the research's findings. While the action variable for the control group was $p = 0.846$ and $p = 0.00$ for the intervention group, respectively. As a result, it is imperative that administrators and teachers in schools address physical education (PENJASKES) lessons that relate to kids consuming fruits and vegetables.

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