

Education on the Importance of Adequate Iodine Intake in School Children

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ABSTRACTS

Background: The purpose of this study is to educate the public about the importance of maintaining adequate daily intake of iodine.

Methods: The method used is an experimental method with a quantitative approach. This research was conducted on 14 residents of Cihanjuang Village, Parongpong District, Indonesia. There are 3 main steps in carrying out this research, including (i) filling out the pre-test; (ii) provide education through animated videos; (iii) filling out the post-test questionnaire.

Result: From the results of the study showed an increase from the results of the pretest score to the posttest with a value of 45 to 82.5. while the N-Gain results obtained were 71%, meaning that education for the people of Cihanjuan Village, Parongpong District about the importance of adequate iodine intake for school children is quite effective. The t-test carried out also concluded that the results of $t_{count} < t_{table}$, with numbers $-9.449 < 1.77093$ which means that the posttest score of respondents increased not significantly.

Discussion: With the implementation of this research, it is hoped that more people will become aware of the importance of maintaining daily iodine intake, especially for school children. So that IDD (Iodine Deficiency Disorders) can be avoided.

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1. Introduction

Iodine is one thing that every parent must pay attention to for their children, considering that there are so many problems that can arise if children do not get enough iodine intake. The problem that often arises and becomes the main problem in this phenomenon is the emergence of Iodine Deficiency Disorders (IDD) in people whose iodine intake is not met. Disorders Due to Iodine Deficiency (IDD), is a broad description of a disorder due to iodine deficiency which is characterized by physical and mental disorders with very varied descriptions according to the level of human development (Kusuma & Budiono, 2016). People affected by IDD will experience many negative impacts that will affect their lives as well as the quality of human resources themselves. Examples are decreased learning achievement in school-age children, impaired physical and mental growth of children, can also cause goiter in the neck area, and many other impacts.

This problem arises because there are still many people who do not pay too much attention to the importance of daily consumption of Iodine, and also the uneven sales of iodized salt in the regions. Riskesdas data (2007) explains that the average status of Iodine in Urine or IEU (*rineary Iodine Excretion*) of Indonesians reaches 224 g/l, which means that Indonesia has reached the WHO/UNICEF/ICCIDD standard with a standard of 100 g/l. The coverage of iodized salt consumption in Indonesian society is at 86%, but only 62.3% meet the requirements, while those who do not meet the requirements are 23.7%, and finally, there is no consumption of iodized salt at all, at 14.0%. This means that there are still some people who still don't use iodized salt, and people who already use iodized salt don't even realize how important it is to have adequate iodine intake.

Education is a learning process that is carried out at the formal and non-formal levels with the aim of providing understanding or educating related knowledge to be delivered (Dinas Pendidikan Kota Jambi, 2021). According to Lewis (2007) in Sudarto (2012) Iodine is a non-metallic halogen element consisting of a number of atoms. Iodine functions include catalyst condensation, iodization, antiseptic, and germ-killing and others (Astutik, 2017, Almatsier, 2003). Meanwhile, Iodine Deficiency Disorder (IDD) is a collection of symptoms that arise as a result of a person's body experiencing a lack of iodine for a long period of time. For this reason, in overcoming this problem, it is necessary to have solutions such as the use of natural ingredients and also iodine-enhancing supplements that are spread around the house or the area we live in, as well as increasing public awareness of the importance of consuming sufficient iodine.

There have been many previous studies regarding this discussion, including the research conducted by Sudarto (2012) with the title "Management Of Idd Through Improving The Quality Of Production And Distribution Of Ioded Salt", this article focuses more on increasing the production and distribution of iodized salt. Another study was also conducted by Irawati, et.al. (2011) with the title "The Level of Iodized Salt Consumption and Its Relation to Disorders Due to Iodine Deficiency of Pregnant Women" in this article discusses the relationship between salt consumption and IDD patients in pregnant women and discusses the quality of salt that is good and not for consumption and distribution in Indonesia.

In our research, we focus more on educating the surrounding community so that they can pay more attention to the importance of maintaining iodine intake. This aims to form a mindset or *mindset* about the importance of maintaining iodine intake, because then they will automatically be moved to always pay attention to adequate iodine intake. The novelties

in this research are; (1) Educating the public on the importance of maintaining adequate iodine intake every day, (2) People will become more aware of the dangers and importance of maintaining daily iodine intake, (3) forming a good mindset among the community, so that they will be moved by themselves. without having to be constantly reminded.

2. Materials and Methods

2.1. Materials

The research subjects are people who live in the Cihanjuang Village area, Parongpong District, Indonesia. According to Pratiwi (2017), the research subject is an informant who is used to provide information and conditions related to the research setting (Moloeng, 2007). We took samples based on a sample of the selected area in the District of Parongpong. There were 14 respondents, consisting of 10 women and 4 men.

The method used is the experimental method, where this method is used to understand the effect of the independent variable in the form of treatment (*treatment*) on the dependent variable or results under controlled conditions. According to Sumantri (1999) explained that the experimental method is a way of teaching and learning that involves students by experiencing, testing. Prove yourself the results of the experimental process (Ratman, Rismawati, & Dewi) (Sumantri & Mulyani, 1999). This study uses a quantitative approach. According to Creswell (2014) the quantitative approach is a method used by examining the relationship between variables by testing certain theories. Usually, the variables will be measured with research instruments, so that data consisting of numbers can be analyzed based on statistical procedures. In S. Musianto (2002) also explains that the quantitative approach is an approach that in research proposals, processes, hypotheses, goes to the field, data analysis and data conclusions until the writing uses aspects of measurement, calculation, formulas and certainty of numerical data.

In this study, we used a research instrument in the form of a questionnaire (questionnaire). According to Sugiono (2013) in Sukendra & Atmaja (2020), research instruments are devices used to measure a natural or social phenomenon that is being observed. Then according to Purwanto (2018), research instruments are basically a tool used to collect data in research. In practice, we use two questionnaires including a google form, and a hard file questionnaire which is distributed directly to prospective respondents. After that, the data will be collected and processed for later use as research material.

2.2. Method

Research design is a desired pattern or form of research that provides guidance or arguments in conducting research (Mulyadi, 2012). Research data collection was carried out by distributing questionnaires or questionnaires using Google Form media to the community around Cihanjuang Village, Parongpong District, Indonesia. Questionnaire or questionnaire is a method of collecting data by giving a set of written statements or questions to respondents to respond according to user requests (Widoyoko, 2016). In the questionnaire there are 3 stages in data collection, namely (i) filling in the pre-test; (ii) provide education through animated videos; (iii) filling out the post-test questionnaire. Making questions and educational videos focused on education about how to pay attention to adequate iodine intake in school children. The types of questions or pre and post test questions are types of questions

in the form of points 1 to 5 which define the extent to which respondents understand the material discussed. The scoring is marked as 1 for the lowest level of understanding, to the highest score of 5 for the highest level of understanding.

2.2.1 Equations

Normalized Gain or N-Gain analysis is used to measure the improvement of process skills and learning outcomes between before and after learning or education is carried out (Sundayana, 2014). The formula used to calculate the N-Gain value is as follows.

$$N\text{ Gain} = \frac{\text{Skor Posttest} - \text{Skor Pretest}}{\text{Skor Ideal} - \text{Skor Pretest}}$$

Ideal score is the maximum value that can be obtained by respondents when filling out the pretest and posttest questions. The ideal score is also the score used to calculate the score that determines the rating scale, and the total number of answers (Mubarak et al., 2018).

There are several choices for the N-Gain value category that can be used as a benchmark in determining the final result value. **Table 1** is the classification of the N-Gain score category (Prastiwi & Nurita, 2018).

Table 1. Distribution of N-Gain Scores.

N-Gain Value	Category
$g > 0.7$	Tall
$0.3 \leq g < 0.7$	Currently
$g < 0.3$	Low

Based on **Table 1**, when the gain value is more than 0.7, it is categorized as high. When the gain value is 0.3 or 0.7 or between 0.3 and 0.7, it is called the medium category. And when the gain value is less than 0.3 then it is in the low category.

3. Results and Discussion

In **Table 1** shows the results of the N-Gain analysis. Gain is the difference between the pretest and posttest scores in showing the quality of improving the understanding of the learning process or the respondent's education regarding the understanding given (Nismalasari, Santiani, & Rohmadi, 2016). Based on the processed data, from table 1 it is known that the average N-Gain value is 0.71 (71%) stating that education through animated videos in increasing the understanding of the importance of iodine intake in school children is very effectively used in the community. With a minimum N-gain score of 0.10 (10%) and a maximum of 1.00 (100%). Based on the conclusions above, Hake (1999) defines if the presentation value of N-Gain is in the 56-75% category then it is included in the category of quite effective interpretation. This result is caused by the respondents' pretest scores which are quite low, and the posttest scores are quite large. From this argument, it can be concluded that efforts to educate the public about the importance of maintaining adequate iodine intake are quite effective and successful.

Table 2 shows the N-gain value of Pre-Test, Post-Test, and percentage of each respondent.

Table 2. Analysis of Pre-Test and Post-Test Gain Values.

No	Name	Score		Post - Pre	100 - Pre	N Gain	Category
		Pre	Post				
1	A	48	82	34	52	0.654	Currently
2	B	58	93	35	42	0.833	Tall
3	C	34	87	53	66	0.803	Tall
4	D	41	47	6	59	0.102	Low
5	E	45	69	24	55	0.436	Currently
6	F	43	79	36	57	0.632	Currently
7	G	70	100	30	30	1,000	Tall
8	H	55	92	37	45	0.822	Tall
9	I	21	48	27	79	0.342	Currently
10	J	70	100	30	30	1,000	Tall
11	K	54	96	42	46	0.913	Tall
12	L	34	84	50	66	0.758	Tall
13	M	27	85	58	73	0.795	Tall
14	N	31	93	62	69	0.899	Tall
Average		45	82.5	37.428571	54.92857	0.71	
Min		21	47	6	30	0.10	
Max		70	100	62	79	1.00	

Figure 1 explains the difference in the results of the pretest and posttest scores for each question. Referring to the picture below, it can be concluded that the overall results of respondents' answers have increased from each question. Means that if we look at these results, the use of google forms and video media to deliver education can be used in delivering materials to the public with high effectiveness. The use of this video media has a large and positive impact on the understanding and perception of the community or respondents in increasing their knowledge.

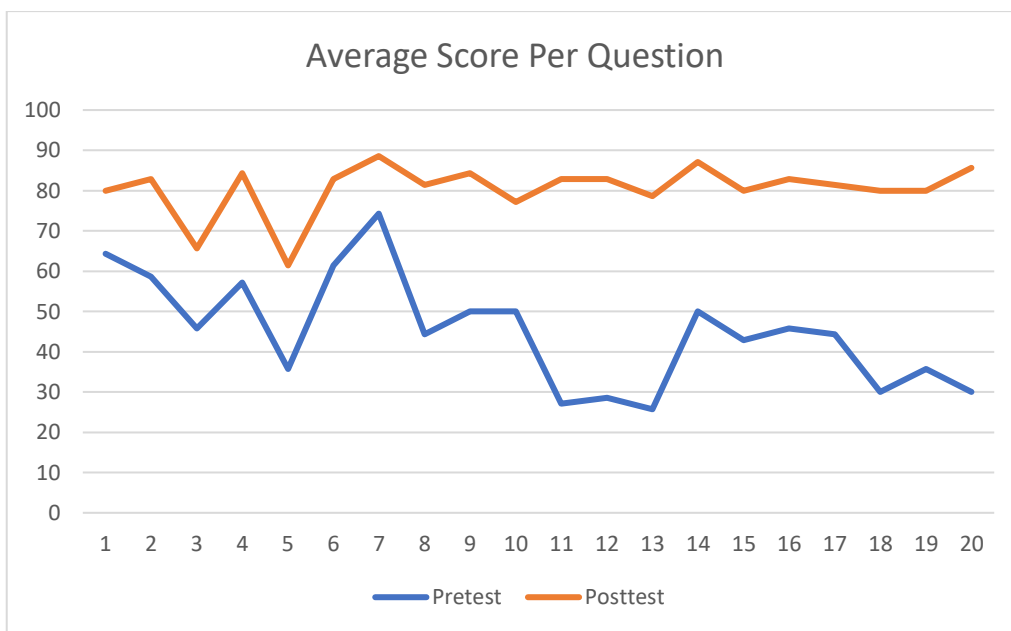


Figure 1. Graph of Pretest and Posttest Results on each question.

Table 3 shows the results of the paired t-test analysis. Paired t-test is a method of testing hypotheses whose data cannot be used freely (in pairs) (Montolalu & Langi, 2018). From the table below, the Pretest has an average value of 45,071 from 20 data. While the posttest has an average value of 82.5 out of 20 data. The average t-test of two paired samples, states that the T count is -9.449 smaller than the T table, which is 1.77093, it shows that the T count < T table means that the posttest value of the respondents increases not significantly.

Table 3. t-Test: Paired Two Sample for Means.

	Pretest	Posttest
mean	45,071	82.5
Variance	228.225	290.7308
Observations	14	14
Pearson Correlation	0.581	
Hypothesized Mean Difference	0	
df	13	
t Stat	-9,449	
P(T<=t) one-tail	0.000	
t Critical one-tail	1,771	
P(T<=t) two-tail	0.000	
t Critical two-tail	2.160	

From all the analyzes that have been carried out, it can be concluded that education on the importance of adequate iodine intake for school children through video media and google forms has a positive impact on increasing the understanding of the people of Cihanjuang Village, Parongpong District. Based on the N-Gain, the selection of video media as a means of conveying the importance of iodine intake got quite effective results. The

results of the t-test concluded that the use of video media as a means of delivering material had an insignificant impact on the respondents.

4. Conclusions

The research carried out has the objectives of; (1) Educating the public on the importance of maintaining adequate intake of iodine every day; (2) The public will become more aware of the dangers and importance of maintaining daily intake of iodine; (3) form a good mindset among the community, so that they will be moved by themselves without having to be reminded continuously. There are 3 main steps in carrying out this research including (i) filling out the pre-test; (ii) provide education through animated videos; (iii) filling out the post-test questionnaire. From the results of the study showed an increase from the results of the pretest to posttest scores, namely with a value of 45 to 82.5. while the N-Gain results obtained are 71%, meaning that education for the people of Cihanjuan Village, Parongpong District about the importance of adequate iodine intake in school children is quite effective for use. The t-test conducted also concluded that the results of $t_{count} < t_{table}$, with numbers $-9.449 < 1.77093$, which means that the posttest score of respondents increased not significantly.

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