



American Journal of Clinical Anatomy & Physiology

Research Article

The Effect of Health Education on the Knowledge of Children Aged School -

**Agussalim^{1*}, Gutit Enny², Josephine Lorica³, Harliani⁴, Syamsir⁵, and
Abidin⁶**

^{1,5,6}Parepare School of Nursing, Health Polytechnic of Makassar, Jalan Laupe Makassar, South Sulawesi Province.

²School of Nutrition, Jayapura Health Polytechnic, Jalan Padang Bulan 2, Hedam, Heram, Jayapura City, Papua Province, Indonesia

³School of Nursing, Saint Paul University Philippines, Mabini Street, Tuguegarao City, Philippines

⁴School of Nursing, Health Polytechnic of Makassar, Jalan Bendungan Bili-Bili, Makassar, South Sulawesi Province

***Address for Correspondence:** Agussalim, Parepare School of Nursing, Health Polytechnic of Makassar, Jalan Laupe Makassar, South Sulawesi Province, E-mail: salim170878@gmail.com

Submitted: 05 October 2020; Approved: 12 October 2020; Published: 19 October 2020

Citation this article: Agussalim, Enny G, Lorica J, Harliani, Syamsir, et al. The Effect of Health Education on the Knowledge of Children Aged School. American J Clin Anat Physiol. 2020;2(1): 018-025. doi: 10.37871/ajcap.id15

Copyright: © 2020 Agussalim, et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

SUMMARY

School-age children are a group that is quite susceptible to dental caries. In 2013 there was an increase in the number of dental caries cases and most were in the age group below the age of 18 years, so the preventive measures were emphasized at the age of 6-12 years or the age of school-age children. Efforts to prevent dental caries through health education. Penelitian it aims to identify the effect of health education on the knowledge of children aged School of Dental Caries in primary PI Antang I Makassar. Type penelitian is Adalaha experimentation using *Pre Experimental Design* with the *One Group Pre-Test Post-Test design*. The sample consisted of 37 respondents taken using the *Total Sampling* technique. **The results** showed that the value of knowledge of adolescents before counseling was 1,32, while knowledge after counseling averaged 1.89. Statistical test results using the *Mc Nemar Test* showed $p = 0,000$ where $\alpha = 0,05$. **The conclusion of the study** is that there is an effect of health education on school-age children's knowledge of dental caries in SD Inpres Antang I Makassar.

Keywords: Health Education; Knowledge; Dental Caries

INTRODUCTION

Teeth are part of the mastication tool in the digestive system in the human body. The main problem of children's oral health is dental caries. Dental disease that is often suffered by almost all residents of Indonesia is dental caries. Generally, children entering school age have a high caries risk, because at this school age children usually like snacks and drinks as they wish which contain lots of carbohydrates. Besides that, there is still a lack of socialization and counseling, especially for school children regarding oral health [1]. Children aged 6-12 years are more susceptible to dental disease because it is an age crisis group, at that age there is a transition of tooth growth from baby teeth to permanent teeth. Dental abnormalities that often occur in children, namely dental caries. Children who visit the dentist are usually already experiencing severe damage, very large cavities, swollen, even toothless. This incident can be caused by 4 factors, namely: germs found in teeth, food scraps, especially carbohydrate groups such as sugar, bread, or other fatty foods that are sticky to teeth, and teeth with shapes that are very difficult to clean perfectly so that it can cause holes on the teeth. The incidence of dental caries throughout the world has a fairly high rate of 80-90% in children under 18 years. Children aged 6 to 12 years like to consume fast food or snacks that are not maintained hygiene, as evidenced in the incidence of dental caries which is 76,62%. The target set by WHO is 90% of children aged 5 years without caries. While the incidence of dental caries in Indonesia in 2007 reached 43.4% and increased in 2013 to 53.2%. In general there are 45 dental and oral diseases that occur in Indonesia, one of which is dental caries. These results indicate a prevalence of 53.2% experienced dental caries that has not been addressed or have not done fillings, so that in Indonesia there are 93,998,727 inhabitants suffer from active caries. [2].

According to data from the Basic Health Research (RIKESDAS) in 2013, the national prevalence of dental and mouth problems was 25.9%, as many as 14 provinces had a prevalence of dental and mouth problems above the national rate ie DKI Jakarta 29.1%, West Java 28%, Yogyakarta 32.1%, East Java 28.6%, West Nusa Tenggara 26.9%, East Nusa Tenggara 27.2%, South Kalimantan 36.1%, North Sulawesi 31.6%, Central Sulawesi 35.6%, South Sulawesi 36.2%, Southeast Sulawesi 28.6%, Gorontalo 30.1%, West Sulawesi 32.2%, Maluku 27.2%, North Maluku 26.9%. (Trihono, 2013)

The impact of caries in children if left unchecked will result in caries reaching the dental pulp and causing pain. Pain will affect the child's laziness to chew food so that the child's nutritional intake will decrease and affect the child's growth and development. Dental caries that are not treated other than pain, over time will cause swelling due to the formation of pus from the teeth. If the tooth condition is

very severe, the extraction of milk teeth prior to the date of the tooth extraction will be done so this will result in the shifting of the space for the permanent teeth to grow, causing malposition of the permanent teeth [3].

Based on the Health Profile of South Sulawesi in 2012, the highest dental and mouth problems were dental caries cases, seen from the number of dental cases reaching 15,893 cases. SD Inpres Aangang I has a total number of 415 students. Consisting of 89 total students for Class I, 72 total students for Class II, 69 total students for Class III, 95 total students for Class IV and 90 total students for all Class V. Menurup Administration (TU) and the Trustees of the School Health Unit (UKS) Sekolah SD Instruction Antang I Makassar do not get health education on dental caries either of the NGO (Non Governmental Organization) as well as of the health care team directly. Based on this background and taking the initial data that has been done, the researchers are interested in conducting research on "Pengaruh education Kesehatan Terhadap Pengetahuan human children aged school tentang dental caries in primary PI Antang I Makassar".

Statement of the problem

Based on the description in the background then formulated at issue in this study is : Pengaruh education Kesehatan Terhadap Pengetahuan human children of school age tentang dental caries in Makassar Antang I primary school inpres.

Purpose of study

To determine the knowledge of schoolchildren about caries before and after the intervention and knowing pengaruh education kesehatan terhadap pengetahuan human children aged school tentang caries teeth in Antang I Makassar Inpres Elementary School.

Study literature

Overview of Dental Caries: Dental caries is damage to dental caries tissue caused by acids present in carbohydrates through intermediaries of microorganisms present in saliva [4]. Dental caries is a disease of tooth tissue marked by tissue damage, starting from the surface of the teeth (niches, fissures, and interproximal regions) extending toward the pulp (Brauer). Dental caries can be experienced by anyone and can arise on one or more tooth surfaces, and can extend to deeper parts of the teeth, for example from enamel to dentin or to the pulp. Caries due to various reasons, including: carbohydrates, microorganisms, saliva, surface and shape of teeth.

Carbohydrates left in the mouth and microorganisms, are the cause of dental caries, while the cause of indirect dental caries is the surface and shape of the tooth. Teeth with deep fissures cause



food debris to stick and survive easily, so that acid production by bacteria will take place quickly and cause dental caries. (Tarigan, 2013).

Caries or caries in Indonesian is actually not a term for cavities. In a dentist's website explained that caries is a term for infectious diseases. Caries that occur in teeth are called dental caries. But because most people dat a ng with cavities circumstances as a sign of caries, dentists mengistilahnannya with teeth with caries. Finally, the layman concluded that caries is the same as cavities. Caries is a dental problem that is commonly found in Indonesia. So much so that sufferers often ignore it. Even if left untreated, this disease can cause pain, tooth loss, infection, and even death. (Mampuni & Pratiwi, 2013).

Caries is a disease of hard tissues of teeth, namely enamel, dentin, and cementum caused by the activity of a microorganism in a carbohydrate that can be share [5]. Caries begins with the appearance of brown or white patches which then develop into brown holes. This hole occurs due to the breakdown of dental minerals due to carbohydrate fermentation reactions including sucrose, fructose, and glucose by several types of acid-producing bacteria. When we were young we must have been familiar with the advice of our parents: *don't eat too much candy, and then your teeth will be toothless!* Permen contain a lot of sugar. Residual sugar left in the mouth and on the teeth is what causes the pH in the mouth to acid until the tooth mineral used a d i shed. A hole in a new tooth will hurt when the cavity is deep and reaches the pulp cavity which contains blood vessels and nerves. Teeth that have been capped must be patched immediately to prevent further infection. However, if the gums have swollen root treatment must be done.

Dental caries bus a visible with the naked eye. All teeth that have white or brownish spots on the enamel can be diagnosed with caries. So the bus is actually a detectable since early although not appear physically their holes in the teeth. In some cases radiographic assistance is needed to observe and determine how far the disease has damaged teeth. Caries can be prevented by good habits brushing teeth after meals and before bedtime and regular dental check faithful p six months. (Mampuni & Pratiwi, 2013)

Etiology of Caries

Dental caries is caused by 3 interacting factors or components namely:

- a. Components of teeth and saliva (*Saliva*) which include: Tooth composition, tooth morphology, position of the tooth, saliva ph Saliva thickness.
- b. Components of microorganisms that are in the mouth that can produce acids through fermentation, namely: Streptococcus, Lactobacillus.
- c. Food components that are very important are foods that contain carbohydrates such as sucrose and glucose which can be shared by certain bacteria and form acids.

The basic anatomy of a tooth consists of crowns and roots. The crown is visible in the mouth, while the root is immersed in the jawbone and gums. Three types of bacteria that cause dental caries are:

- 1) Lactobacillus, the population is influenced by eating habits. The most preferred place is deep dentin lesions. The large amount found in carious plaque and clinking is just a coincidence and

Lactobacillus is only considered a contributing factor to the caries process.

- 2) Streptococcus, Gram-positive coccus bacteria are the main causes of caries and the most in the mouth. It is more sleepy than others and can reduce the pH of the medium to 4.3. Mutans are mainly found in populations that consume a lot of sucrose.
- 3) Aktinomises, All species of Aktinomises ferment glucose, mainly forming lactic acid, acetic acid, succinic, and formic acid. *Actinomyces viscosus* and *A. Naeslundii* are able to form root caries, fissures, and damage the periodontium. (Indah & Ayu, 2013)

Clinical Manifestations

The clinical picture of email caries is:

- a. Early lesions or white / brown patch (caries insipient).
- b. Advanced lesions (lesions that have cavitation)

The earliest symptom of macroscopic email caries is a "white spot". These patches are clearly seen on dry tooth extractions that appear as a small, opaque lesion and are a white area, located slightly towards the cervix from the contact point. The color looks different than the surrounding e-mail that is still healthy. At this stage detection by Sonde cannot be done because the email that surrounds it is still hard and shiny. Sometimes the lesions appear brown because the material is absorbed into the pores. Both white and brown patches usually last for years because the development of these lesions can be prevented. If the email lesions develop, the original intact surface will rupture (cavitation) and a hole (cavitation) will form.

At the time of inspection, good lighting is needed. Teeth must be clean and dry so that dirt and tartar must be cleaned first. Teeth must be completely dry and usually dry by spraying Severa slowly. To find the earliest sign of caries requires sharp vision. Usually the examination is carried out with a sharp sonde until it feels related. This should not be done because a sharp sonde will damage the new carious lesion and bacteria will be carried in the lesion so that the caries spread [4].

Tooth element structure:

In the outer portion of the tooth, the enamel is covered by a dental cuticula. This dentic cuticula was first investigated by Waldeyer (1871) in Tarigan (2013) and functions as a (veil) for acidic states or proteolysis stimuli, especially to prevent caries.

- a. Email (*Substantia ad Amanantina*)

In Greek, email is called Adama which means "steel". Tooth enamel is the hardest tissue in an animal or human body.

- 1) Physical Traits , According to *Baud* and *Lobjoie* (1965) in Tarigan (2013), email violence is increasingly in the direction of dentin decreasing. Young people's e-mails are softer than older people's.
- 2) Biological properties, tooth enamel is an element of *bradytrophes*, that is, the tissue that gets very little food. The question of whether e-mail is a vital network is still contested. There are researchers who say that e-mails are found with ultracapillars so that they are attempted to be implanted, but nothing works.



In the investigation with an electron microscope also found no food channels in the enamel. However, there is clearly a diffusion of ions in the saliva (saliva) to the enamel so that the older the patient gets, the harder the enamel is. This property is often used for fluorine treatment or fluorine application.

- 3) Perikimata, according to *kroncke* (1966) in Trigan (2013), formed in 11.4-26.0 days (depending on the individual and teeth) with a curve of size 0.39-3.04. Distance perikimata one with another 0,09 -0.15 mm.
- 4) *Retzius* lines, these form an angle of 45 with enamel prisms, which are parallel to each other. On the outside it empties into the perikimata. Mineralization of the *Retzius* line is less, and is a *loci minoris resistance*, the place where caries begins.
- 5) *Lamella Email*, this Lamella email consists of plates which are very lacking in calcification (hypomineralization). So, it is a fragile area too. The process is formed and its purpose is unclear. There is an opinion that says that email lamella is useful for getting email elasticity.
- 6) Check Email, is an area of hypomineralization. Almost the same as lamella email, this email bush is small, in the form of imperfect calcification plates. Check this email often we find on the neck of a tooth.
- 7) The ends of the Tome of fiber, this is the next edge of the odontoblast found in the e-mail section. The relationship between enamel and dentin is uneven but clustered (Arkadenforming). At the boundary between enamel and dentin, it was thought that there was a layer called "Membrane Limitants", but in electron microscope studies, this membrane was not encountered.

Factors that influence dental caries

Many factors that affect the occurrence of Caries 's teeth. From the observations made, it is clear that the closer humans are to nature, the less caries are found in their teeth. With the increasingly sophisticated food factory, the higher the percentage of caries in the people who consume food from the factory. Things that can affect the occurrence of dental caries in humans

- a. Heredity, from a study of 12 pairs of parents with good dental conditions, it was seen that children from 11 pairs of parents had a fairly good dental condition. In addition, from 46 pairs of parents with a high percentage of caries, only 1 (one) pair who had children with good teeth, 5 (five) pairs with a moderate percentage of caries, the rest 40 pairs again, with a high percentage of caries. However, with such a caries prevention technique developed in recent times, in fact the hereditary factor in the process of caries has been reduced.
- b. Race, the effect of race on the occurrence of dental caries is very difficult to determine. But the state of the jawbone of a race may be related to the percentage of caries that is increasing or decreasing. For example, in certain races with narrow jaws so that the teeth in the jaw often grow irregularly. With this irregular dental condition it will be difficult to clean the teeth, and this will increase the percentage of caries in the race.
- c. Sex, dental caries in women is higher than in men. The percentage of left molar caries is higher than that of the right molar, due to the mastication and cleansing factors of each tooth.

d. Age, throughout life, there are 3 phases of age seen from teeth.

- 1) Mixed tooth period, where molar 1 is most commonly affected by caries.
- 2) The period of puberty (teenagers) ages between 14-20 years. At puberty hormonal changes occur that can cause swelling of the gums, so that oral hygiene becomes less awake. This is what causes a higher caries percentage.
- 3) Age 40-50 years.

At age is already happening retraction at a u declining gums and buds so that the leftovers are often more difficult to clean.

e. Food is very influential on teeth and mouth; this effect can be divided into 2:

- 1) The contents of food that produce energy. carbohydrates, proteins, fats, vitamins, and minerals. These elements influence the pre-eruption and post-eruption period of the teeth.
 - 2) The function of the mechanism of food eaten food which is to clean teeth. So food is a natural tooth brushing, which of course will reduce tooth decay. This cleansing food is apple, guava water, yam, and so forth. Conversely foods that are soft and stick to teeth are very damaging to teeth, such as bonbon, chocolate, biscuits and so on. Caries occurs when the remineralization process becomes slower than the demineralization process, as well as the loss of minerals. This can be prevented by avoiding sweet foods and removing plaque. Remineralization of teeth can occur in environmental PH which is: A little amount of cariogenic, the presence of fluoride, failure of the substance causing bacterial metabolism, increased salivary secretion, high *buffering* ability, the presence of salivary organics, cleaning of retained food
- f. Saliva, the effect of saliva on teeth has long been known, especially in affecting enamel hardness. This saliva is excreted by the parotid gland, the sublingual gland, and the submandibular gland. For 24 hours, saliva released by the three glands is 1000-2500 ml, with the submandibular glands secreting 40% glands and 26% parotid glands. At night less saliva is released. Patients with the secretion of saliva that little or none at all, for example because aprialismus, malignant cancer radiation therapy, and xerostomia, a high percentage of dental caries is increasingly rising. It is also common to find toddlers aged 2 years with damage or caries in all their teeth due to parotid gland aplasia.
- g. Plaque, recently more intensive research on plaque has been carried out to prevent dental caries. Plaque is formed from a mixture of saliva ingredients such as mucin, remnants of oral tissue cells, leukocytes, lymphocytes, and food debris, and bacteria. At first the plaque was formed so that the liquid, which eventually became a chel, where bacteria grow. There is no denying that after eating we must eliminate as much plaque as possible, because plaque is the beginning of tooth decay. As Kantorowicf said, "Clean teeth will be difficult to damage". (Taringan, 2013)

METHODS OF STUDY

This study uses an experimental research design, with a Pre-



Experimental research design using a pre-post-test approach in one group (*one-group pre-posttest design*) (Nur Salam, 2008). Where the respondent is given a *pre-test* before being given an intervention, then after the intervention the *post-test* is conducted. Testing causal by way of comparing the results of the *pre-test* to *post-test*. As can be seen in the table as follows:

Subject	Pre-test	Treatment	Post-test
K	0 Time 1	I Time 2	01 Time 3

Information:

K: Subject

0: Observation before intervention (*Pre-Test*)

I: Intervention

01: Observation after the intervention (*Post-Test*)

Research is conducted in SD Instruction Antang I Makassar, in June 2017.

Population is a generalization area consisting of: objects / subjects that have certain quantities and characteristics determined by researchers to be studied and then drawn conclusions [6]. The population in this study was Class III students, a total of 69 people at the SD Inpres Antang I Makassar.

The sample is part of the number and characteristics possessed by the population [6]. The samples in this study were all students of class III who were in SD Inpres Antang I Makassar totaling 69 people.

The inclusion criteria and exclusion criteria are as follows:

Inclusion Criteria:

- Class 3 students at SD Inpres Antang I Makassar;
- Following the entire series of activities and health education carried out;
- Willing to be a respondent

Exclusion Criteria:

- Students who were not present during health education;
- Do not follow the complete health education process.

The method of collecting samples used in this study is using the technique of total *sampling* is sampling technique by taking the entire population as a representative respondents or sample [6]. Thus, researchers took samples from all grade III students who were in SD Inpres Antang I Makassar.

Instruments that are used in this study were a questionnaire with *leaflets* and *slide / powerpoint*. Questionnaires p What Knowledge contains 10 types of questions. The questionnaire was directly given to the respondent / sample.

The intervention in this study was to conduct a health education about dental caries using *leaflets* and *slides/powerpoints* with learning unit.

Data analysis was performed by (1), Univariate Analysis, namely processing data carried out using a computerized statistical program. In this study, univariate analysis was conducted to find out the proportion of each research

variable, namely the independent variable which is a characteristic of the research subjects. Next to (2) a Nalis is Bivariate the analysis performed to see the relationship between two variables that include the independent variables and the dependent variable. In this study bivariate analysis was used to determine whether there was an influence of the independent variable, namely health education about dental caries with the dependent variable, namely students' knowledge of dental caries. Data obtained through questionnaires analyzed is using *non-parametric test* that *McNemar*, which is done in the statistical program.

RESULT

This research was conducted at SD Inpres Antang I Makassar by providing health education to find out whether there is an effect of health education on school-age children's knowledge of dental caries with media aids such as *leaflets / leaflets* and *slides / powerpoints* that contain material about dental caries in third grade students (Three). Samples obtained by researchers were 37 students. First distributed questionnaires to determine the initial state (pretest) and then do health education about dental caries after that the same questionnaire was distributed (*posttest*) to determine differences in knowledge after health education. The data collection through the questionnaire was carried out by researchers to each respondent.

The results of this research are grouped into two namely general data and special data. Which includes general data is demographic data which includes the population, gender and class. In general terms are presented in the form of univariate analysis. Specific data includes data obtained from the questionnaire answers. Specific data is presented in the form of bivariate analysis which includes the effect of the independent variable with the dependent variable.

Univariate Analysis

a.Characteristics of Respondents

Table 5.1 above shows that the largest number of samples is at the age of 9 years as many as 22 students (59.5%), and at the age of 8 years as many as 15 students (40.5%).

Table 5.2 above shows that the number of sample according to gender is male - male as much as 14 respondents (37, 8 %) and women as much as 23 respondents (62.2%)

Table 5.3 above shows that the number of samples according to class ie class III amounts to 37 students (100%).

b. Distribution frequency based *Pre-test* and *post-test* respondents in SD Instruction Antang I Makassar

Table 5.4 above shows number of samples according to the knowledge pretest is less knowledge as much as 25 respondents (67.6%) and a good knowledge of as many as 12 respondents (32.4%).

Table 5.5 above shows that the number of samples according to knowledge *posttest* namely good knowledge as much as 33 respondent (89.2%) and lack of knowledge as much as 4 respondents (89.2 %).

Bivariate Analysis

Each variable is analyzed before normalcy data distribution testing. This test is very important because whether or not normal data distribution affects the selection of data presentation and the



type of test used in hypothesis testing. The analytical method chosen was the *Mc Nemar* test.

From table 5.6 above illustrates that there were 37 respondents. For the *Pretest* category with a *mean* value of 1.32, a standard deviation value of 0.474, a *min* value of 1 and a *max* value of 2 while for the *post test* category with a *mean* value of 1.89, a standard deviation value of 0.314, a *min* value of 1 and a *max* value of 2. And then the results of the table above show that of 37 respondents who had good knowledge before and after health education were 12 respondents and none of the respondents had good knowledge before health education and after being given health education. Furthermore, respondents who had less knowledge before health education and after being given health education had good knowledge of 21 respondents, while respondents who had less knowledge before and after being given health education were 4 respondents. With the *Mc Nemar* test, the results showed a significance value of 0,000 ($p < 0.05$).

Table 5.1: Frequency distribution based on respondent age at SD Inpres Antang I Makassar .

1) Age

Age	(n)	Percentage (%)
8 years	15	40.5
9 years	22	59.5
Total	37	100

Table 5.2: Frequency distribution based on sex respondent at SD Inpres Antang I Makassar.

2) Gender

Gender	(n)	Percentage (%)
Male	14	37.8
Girl	23	62.2
Total	37	100

Table 5.3: The frequency distribution of respondents by k elasat SD Inpres Antang I Makassar.

3) Class

Class	(n)	Percentage (%)
III	37	100
Total	37	100

Table 5.4: Distribution of frequency based on knowledge *pretest* of respondents at SD Inpres Antang I Makassar.

1) Pre test

Knowledge	(n)	Percentage (%)
Less	25	67.6
Well	12	32.4
Total	37	100

Table 5.5: Frequency distribution based on knowledge *Posttest* of respondents at SD Inpres Antang I Makassar.

2) Post test

Knowledge	(n)	Percentage (%)
Less	4	10, 8
Well	33	89, 2
Total	37	100

Table 5.6: Analysis of the effect of health education on knowledge school-age children about dental caries in SD Inpres Antang I Makassar.

	N	The mean	Std. Deviation	Min	Max	P.
Pre-Test	37	1.32	.474	1	2	0,000
Post Test	37	1.89	0.314	1	2	
						Post Test Not Good
Test	Pre-			Less	4	21
				Well	0	12

DISCUSSION

The results showed that the level of knowledge of school-age children who were not given health education about dental caries was less than after being given health education about dental caries. The knowledge of school- age children increases marked by the *pretest* value of 877 while the *posttest* is 1,272 from the *rating scale score*. Knowledge of school-age children increased marked by the *pretest* value of 1, 32 while the *post- test* 1.89. From the *Mc Nemar* hypothesis test results obtained $p = 0,000$. Where the probability value is smaller than $p < 0.05$, i.e. ($\alpha = 0.005$), it can be concluded that H_0 is rejected, which means that this study shows that there is an influence of health education on school-age children’s knowledge of dental caries in SD Antpres I Makassar (H_a accepted and H_0 rejected).

Based on the results of research that has been done, it is known that from a total of 37 respondents, the knowledge of students before the intervention in a good category was 12 respondents, while the students’ knowledge before intervention in the category was less than 25 respondents. In this case the knowledge of respondents is still more knowledgeable less than those who have good knowledge. Identified that these respondents had heard or get information about dental caries either of the medium of television, radio, posters, as well as from non-governmental organizations m asyarakat (NGOs) and other health team, so what’s been seen, heard and read by students This will make them get new things about dental caries, so that the knowledge of the basic concepts of dental caries becomes good.

This is in line with [7] theory; knowledge is the result of human sensing or the result of someone’s “knowing” about objects through their senses. Sensing occurs through the five human senses namely, the sense of sight, hearing, smell, taste and touch. Most of human knowledge is obtained through the eyes and ears. Knowledge or cognitive is a very important domain for the formation of one’s actions. P: What Knowledge is information and discovery is a process of creative to retain new knowledge [8]. Humans gain knowledge in various ways, namely the traditional way, asking people who are experts, from experience, after solving problems and thinking critically [8].

This is in line with the theory of [9], stating that a person’s knowledge can be influenced by several factors. F actors who influence one’s knowledge include experience, level of education, beliefs, facilities, income, and social [10]. The more experience a person gets from his own experience such as by reading books and other people around him the more extensive the knowledge of that person. The more facilities as sources of information such as radio, television, magazines, newspapers and books, the more knowledge is gained.

Based on the results of research that has been done, it is known that from a total of 37 respondents the knowledge of students after

an intervention in a good category increased by 33 respondents, while the students' knowledge after an intervention in a category that was less became 4 respondents.

This shows that health education is carried out in an effective category, because there is an increase in respondents' knowledge or understanding. This is because the students of SD Inpres Antang I Makassar have received lessons in the form of health education so that a learning process occurs where something that doesn't know turns into know and from not understanding to understanding.

Health education is an effort to translate what is known about health into the desired behavior of individuals or communities through the education process (Grout cited in Susilo 2011).

This is in line with [11], which says that learning is an attempt to acquire new things in behavior including knowledge, skills, skills, and values with one's own psychiatric activities. From this statement it seems clear that the characteristic of the learning process is to obtain something new, which previously did not yet exist, now has become, which was not yet known, is now known, which was not yet understood, is now understood. The knowledge is ultimately expected to influence behavior.

However, from the results of the *posttest*, there were still 4 respondents who were knowledgeable in the category of lack. Then it was also caused by the respondent paying less attention when the health education event took place so that there were still some respondents with levels of knowledge that were classified as lacking or still, there was no increase in knowledge.

According to [12], a measure of information processing speed is positively correlated with IQ scores. Processing speed depends on neurological efficiency and genetically controlled maturity. From this point of view there is strong evidence that a person's level of intelligence is largely determined by heredity. The fact that children with certain genetic disabilities have an average IQ is much lower than their peers who do not have the same disability (Keogh & MacMillan, 1996) [13]. This research again provides further evidence of the influence of heredity on intelligence. Since in the womb potentially the child has brought the possibility of whether it will be the ability to think as normal, above normal or below normal. However, this potential is not going to evolve or be realized optimally when the environment does not give an opportunity to develop. Therefore, the role of the environment is crucial for children's intellectual development. A child's intelligence can develop if the environment provides opportunities to develop optimally. In matters affecting the development of the intellect in the environment, among others: Increased information stored (in the brain) someone's e until he was able to think reflective, b anyaknya experiences to solve the problem so that one can ber p ikir proportionally, a danya freedom of thought so children can solve problems and draw conclusions.

Based on table 5.6 on the *Mc Nemar* analysis test results, it is known that the average student knowledge before the intervention is 1.32, while the student's knowledge after the intervention is increased to 1.89. This shows that there is a significant comparison between knowledge before the intervention and after the intervention. From the results there are no respondents with the results of knowledge after counseling is lower than before counseling, this means that counseling increases students' knowledge about dental caries while 21 respondents with fixed knowledge, namely the knowledge of school age children/students - students who have been good regarding dental

caries prior to health education, which they have received through print and other electronic media such as books, leaflets, posters, television and others so that the level of knowledge both before and after the interview/counseling. And there are 12 respondents who have better knowledge than before health education, with exposure to material through health education through the media Leaflets and *slides / powerpoints* about dental caries that explains what dental caries is, the etiology or causes of dental caries, the process of dental caries, clinical manifestations or signs and symptoms of dental caries, prevention of dental caries and how to handle or treat dental caries. This is because the knowledge they gain is increased knowledge to respondents related to health education or interventions that have been given. *Test statistics* show the *Mc Nemar* test results can be obtained values that the *significance of 0,000* ($p < 0.05$) thus concluded "there are significant differences in knowledge between before health education and after health education" (Ha accepted and Ho rejected).

This is in line with the research conducted by [10], in his study entitled "the effectiveness of health education using booklet media compared to audiovisual knowledge of parents about dental caries in children aged 5-9 years" "this type of research uses the *Quasi Experimental* method with the research design used is *pretest* and *posttest Design*. Analysis of the data includes test *Paired t-test* and *independent t-test* which stated that there was a significant effect of health education on the knowledge of dental caries.

Likewise with [14], in his study entitled "the effect of health education on dental caries through the picture book media and leaflets on the knowledge, attitudes, and behavior of elementary school children in Malang Regency" this research method uses *Quasi Experimental* with the research design used is *pretest* and *posttest Design*. Data analysis includes the *Mann-Whitney* test which states that there is a significant influence of health education through the media of picture books and leaflets on knowledge about dental caries.

According to the assumptions of researchers, increase knowledge of children aged school one of them is the provision of health education to improve the knowledge of school-age children / students-students about healthy concept - sick of an illness. Through health education with the use of several media including print and electronic media. Electronic media such as counseling by using *slide/powerpoint* media delivered with pictures and colors and presenting all material points about the basic concept of dental caries, as well as print media in the form of *leaflets*. Fill in the *leaflet in* accordance with the information provided with pictures and colors and present all the material points on the leaflet in the questionnaire. *Leaflet* and *Slide/Powerpoint* media are very effective in increasing the effectiveness of counseling by the lecture method, because the *leaflet in* addition to summarizing the entire extension material, also presents an interesting picture that makes it easy for someone to understand the contents of the material. Health education will provide a change of knowledge to realize the optimal degree of health knowing and can prevent things that can harm health. But despite having good knowledge, it does not guarantee school-age children not to avoid the cause of dental caries.

Based on the above assumption is in line with research in tian conducted by [15,16], which examines health education Influence teeth and mouth with media *power point* against the level of knowledge of students aged 9-10 years in SD Negeri Keputran 2 Yogyakarta, This research is Experiment with *one group pretest-*



posttest research design using *Mc Nemar* test which states that counseling with the lecture method accompanied by *power point* media and counseling with the lecture method accompanied by media *leaflets* can increase student knowledge [17].

SUMMARY

Based on the results and objectives of the research, the conclusions that can be drawn are:

1. Before health education on dental caries in SD Inpres Antang I Makassar, from a total of 37 respondents with less categories there were still 25 respondents who did not know about dental caries. While in the good category there are 12 respondents who already know about dental caries [18,19].
2. Students' knowledge after health education about Dental Caries with an increase in the number of respondents in the good category that is 33 respondents, with the existence of health education affects the level of knowledge of respondents from those who did not know then became aware of Dental Caries. But there are 4 respondents who are still in the category of lack, This is because the level of intelligence or ability of students to receive information or lessons is different and or maybe the respondent is not paying attention when the counseling event takes place so that there are still 4 students whose level of knowledge is classified less or fixed [20,21].
3. There is the influence of health education on the knowledge of children aged School of Dental Caries in primary PI Antang I Makassar with Test value *Mc Nemar* in get $p = 0.000$.

REFERENCES

1. Hanapi Ade Nurzaqiah, Incidence of Caries and Gingivitis in Primary School Children 8-12 Years. 2014. <http://repository.unhas.ac.id/bitstream/handle/123456789/11446/SKRIPSI%20FINISH.pdf>
2. Rahmayani. Relationship between Eating Pattern and the Incidence Rate of Dental Caries and Stomatitis in Children Aged 8 to 12 years in elementary school. Muhammadiyah 16 Surakarta. 2017. <http://eprints.ums.ac.id/42155/5/BAB%201.pdf>
3. Suherni. The threat of disease is due to Caries in Children Dental Age Preschool. 2014. <https://health.detik.com/read/2014/02/03/134244/2485499/1556/ancaman-sickness-causes-caries-on-garians-gift-children-usual-precchools>.
4. Indah I, Ayu IS. Dental, Oral and ENT Diseases. Nuha Medika. Yogyakarta. 2013. https://www.fdiworlddental.org/sites/default/files/media/documents/complete_oh_atlas.pdf
5. Hidayat. Dental and Oral Health. CV. Andi Offset. Yogyakarta. 2016.
6. Sugiyono. Methods Research Quantitative, Qualitative and R & D, Alfabeta, Bandung. 2010. <http://www.sciepub.com/reference/237701>
7. Soekidjo N. Health Research Methodology. Rineka Cipta Jakarta. 2010.
8. Potter P, Perry, A. Nursing Textbooks Concepts, Processes, and Practices (Yasmi Asih, Translator). Ed 4. Jakarta: EGC. 2005. <https://www.elsevier.com/books/fundamentals-of-nursing/potter/978-0-323-32740-4>
9. Soekidjo N. Human Resource Development. Rineka Cipta. Jakarta. 2003.
10. Agustin, Maria, Irdawati, Zulaicha S. Effectiveness of Health Education using Media Booklets compared with Audiovisual on Parents' Knowledge of Dental Caries in Children 5-9 Years. 2014. <http://eprints.ums.ac.id/32230/26/02%20NASKAH%20PUBLIKASI.pdf>
11. Soekidjo N. Public Health Sciences and Arts. Asdi Mahasatya. Jakarta. 2007.
12. Ahmad A. Growth and Development. 2013. <http://blogspot.co.id/2013/10/pert-grows-dan-perkembangan.html>
13. Rakhmad S. Health education in nursing. Nuha Medika. Yogyakarta. 2011.
14. Jannah Z. The Effect of Health Education on Dental Caries through Media Picture Books and Leaflets on Knowledge, Attitudes, and Behaviors of Elementary School Children in Malang Regency. 2013. <http://eprints.ums.ac.id/44664/19/JURNAL%20PUBLICATION%20REV.pdf>
15. Duggal, Cameron, & Toumba. At a Glance in Pediatric Dentistry. Erlangga Jakarta. 2014. <https://dentalsecret.ru/wp-content/uploads/2015/11/Duggal-Cameron-Toumba-Paediatric-Dentistry-at-a-Glance-2013.pdf>
16. Brown RG, Burns T. Dermatology Lecture Notes. Jakarta: Erlangga Publisher. 2005. <https://assets.thalia.media/images-adb/05/32/0532e300-eb62-4c1c-90e0-5eab6f699d69.pdf>
17. Capable Yekti, Erlita P. Problems and Solutions of Dental and Oral Diseases. Andi Offset. Yogyakarta. 2013.
18. Nursalam. Nursing Science Research Methodology, Salemba Medika, Jakarta. 2008.
19. Rahmawati. Effects of Counseling with Audio-visual Media on Increasing Knowledge, Attitudes, and Behaviors of Underweight and Poor Nutrition Toddlers in Kotawaringin Barat District, Central Kalimantan Province. 2007. <https://journal.ugm.ac.id/jgki/article/view/17478>
20. Rasinta T. Dental Caries. EGC. Jakarta. 2013.
21. Donna WL. Pediatric Nursing Textbooks. EGC Medical Book Publisher: Jakarta. 2009.