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Knowledge and Oral Hygiene of Elementary Students during Corona Virus Disease 2019 Pandemic

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Abstract
Corona Virus Disease 2019 (Covid-19) has become a pandemic and caused problems in the health sector, including in the oral hygiene. Knowledge is the factor correlated with oral hygiene. The purpose of this study was to analyze the correlation between knowledge with oral hygiene during Covid-19 pandemic. This is an analytical research with a cross-sectional approach. This research was conducted at Tomohon city in June-July 2021. This study used 70 respondents. The research variables are knowledge and oral hygiene. The research instrument is a questionnaire. The data of this study were obtained through interviews. The data obtained were analyzed univariately and bivariately. Bivariate analyze using Pearson correlation test. The results showed that the most of respondents were female (54%), 10-11 years old, and have a good knowledge and oral hygiene. There was correlation between knowledge with oral hygiene during the Covid-19 pandemic (p=0,001; r= 0,768). That can be concluded the knowledge was correlated with oral hygiene of elementary school students in Tomohon city during Covid-19 pandemic.

Keywords*: knowledge; oral hygiene; elementary school; Covid-19*

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I. Background

On March 11, 2020, the World Health Organization (WHO) declared that Corona Virus Disease 2019 (Covid-19) to be a global pandemic. After the declaration of Covid-19 as a pandemic, various reactions emerged from the community. The results of the study show that the common psychological reactions that occur are anxiety and depression around 16%-28% then stress as much as 8% (Rajkumar, 2020). In addition, this pandemic also has an impact on dental and oral health. Indonesia's Basic Health Data in 2018 showed that the majority of dental and oral problems were caries/ toothache, which was around 45.3%, and the most of oral hygiene problems, namely gingival inflammation or abscess, were around 14% (Kemenkes RI, 2020). These data indicate that oral diseases that occur to residents must be resolved in this pandemic situation to prevent an increase in the prevalence of dental and oral problems.

According to WHO (2012), maintenance of dental and oral hygiene is one of the efforts to improve health because it can prevent the occurrence of various oral diseases (Kemenkes, 2012). The main problem in the oral cavity to date is dental caries (Ramdiani et al., 2020). The results of the 2018 Basic Health Research show that the prevalence of caries in Indonesia reaches 57.6% (Kemenkes RI, 2018). The high level of dental caries is influenced by the existence of a health behavior domain consisting of knowledge, attitudes and actions that contribute to determining the degree of public health obtained by a person in determining a person's attitudes and actions (Sari et al., 2020). According to WHO data, dental caries in European, American, Asian countries, including Indonesia, has a prevalence of 80-90% of children under the age of 18, i.e. 6-12 years, who are affected by dental caries. It is estimated that 90% of school-age children worldwide have suffered from caries, the lowest prevalence is in Africa. Dental caries is a chronic disease that often occurs in children (Zikri, 2019).

In North Sulawesi, dental and oral health problems were 31.6%, higher than the national percentage of 25.9% (Kemenkes RI, 2018). In line with this fact, the percentage of North Sulawesi people who need treatment and have received it is still below the national percentage of 8.1%, which is 7.9% (Anonymous, 2015). In North Sulawesi, especially in Tomohon City, research on the status of dental and oral health is still lacking. Research on the status of dental caries in elementary school children in the city of Tomohon shows that the DMF-T index based on WHO criteria is in the moderate category. (Pontonuwu, et al, 2013). Research also conducted by Liwe et al (2015) in the city of Tomohon shows that the prevalence of caries in children in elementary schools in South Tomohon sub-district is still high. The severity of untreated caries (PUVA index) was on average 1.7 and the highest was in the 11-year-old age group in the city of Tomhon (Samuel et al, 2016).

Knowledge is the result of knowing that occurs after people make senses, especially the eyes and ears of a particular object. Most of human knowledge is obtained from education, self-experience and the experience of others, mass media and the environment. Knowledge or cognitive is the most important domain for the formation of one's actions. Behavior that is realized by knowledge will be more lasting than behavior that is not realized by knowledge. Knowledge included in the cognitive domain has 6 levels, namely, knowing, understanding, application, analysis, synthesis and evaluation (Notoatmodjo, 2010). This shows that the better the knowledge a person has, the better his dental health will be, a person gains knowledge through sensing certain objects. Knowledge is obtained as a result of a stimulus that is captured by the senses. Knowledge can be obtained naturally or in a planned manner, namely through the educational process (Pudentiana et al., 2019).

Dental and oral health can be seen from the level of dental and oral hygiene. This can be seen from the process of plaque formation. The remnants of food together with the materials contained in the saliva will unite to become hard and adhere to the surface of the teeth to form tartar and together with microorganisms will cause dental and oral diseases. Plaque is a soft deposit that forms and adheres tightly to the surface of the teeth, when a person does not keep his teeth and mouth clean. Plaque will damage tooth tissue and periodontal tissue, which over time will lead to tartar. Tartar itself is a hard deposit located on the surface of the teeth which has a color ranging from yellowish, brownish, to blackish and has a rough surface (Hiranya et al., 2011).

Knowledge of dental and oral health is very important for the formation of actions to maintain dental and oral hygiene (Lintang et al., 2015). According to WHO data, dental caries in European, American, Asian countries, including Indonesia, has a prevalence of 80-90% of children under the age of 18, i.e., 6-12 years of age being affected by dental caries. It is estimated that 90% of school-age children worldwide have suffered from caries, the lowest prevalence is in Africa. Dental caries is a chronic disease that often occurs in children (Zikri et al, 2019).

Tomohon City, North Sulawesi, regarding the status of dental and oral health is still very less done. Research on the status of dental caries in elementary school children in the city of Tomohon shows that the DMF-T index based on WHO criteria is in the moderate category. (Pontonuwu et al, 2013). Research also conducted by Marsela Liwe, et al (2015) in the city of Tomohon showed that the prevalence of caries in elementary school children in South Tomohon sub-district was still high. The severity of untreated caries (PUVA index) was on average 1.7 and the highest was in the 11-year age group in the city of Tomohon (Samuel et al, 2016). These things indicate a problem. The purpose of this study was to analyzed the correlation between knowledge with oral hygiene of elementary school students during the Covid-19 pandemic.

II. Research Method

This is an analytical study with a cross-sectional approach. This research was conducted in Tomohon City in June-July 2021. There are 70 respondents. The variables studied were knowledge and level of oral hygiene. This variable was measured using a questionnaire and oral hygiene examination. This questionnaire has been tested for validity and reliability. Data obtained through interviews and examination. Data analysis was carried out univariate and bivariate. Univariate analysis to describe the distribution of respondent characteristics such as gender, age, level of knowledge and oral hygiene based on the Simplified Oral Hygiene Index (OHI-S). Furthermore, bivariate analysis was carried out using the Pearson correlation test which aims to test the significance of the correlation between the independent and dependent variables. Data analysis using SPSS 26 application. Data was presented in tables and narratives.

III. Results

This section describes the distribution of respondents' characteristics, namely gender, age, level of knowledge and dental and oral hygiene. The results of the univariate analysis can be seen in Tables 1 and 2.

Table 1. Distribution of respondents by gender

Gender	n	%
Male	32	45.7
Female	38	54.3
Total	70	100.0

Table 1 shows that the majority of respondents were female 38 respondents (54.3%). Furthermore, the respondent's age, knowledge and oral hygiene were described which can be seen in Table 2.

Table 2. Description of the respondent's age, level of knowledge and dental and oral hygiene

Respondent characteristic	Min	Max	Mean	Std. Deviation
Age	10	11	10.67	0.473
Knowledge	14	25	19.40	3.712
OHIS	0.0	1.4	0.7757	0.59135

Table 2 showed that the respondents were between 10-11 years old with an average age of 10.67. The lowest level of knowledge is 14 points and the highest is 25 points with an average of 19.4. Dental and oral hygiene based on OHIS obtained the lowest value of 0.0 and the highest 1.4 with an average of 0.7757. Based on this, it can be seen that the average respondent's level of knowledge is in the less category (score < 20). Dental and oral hygiene showed that respondents were distributed in the good (0.0-1.2) and moderate (1.3-3.0) categories where the average score was in the good category.

Oral Hygiene Index Simplified (OHI-S) or dental and oral hygiene index is a number that indicates a person's level of hygiene obtained by adding up the Debris Index (DI) and Calculus Index (CI) (Hiremath 2011). The results showed that the average oral hygiene index of elementary school students in Tomohon City, North Sulawesi, which was calculated with the dental and oral hygiene index from Greene and Vermillion, included good criteria. This shows that the average accumulation of plaque on the tooth surface of the pupil is small. Plaque forms more quickly in children aged 8-12 years than in adults. Calculus at the age of 7-9 years occurred by 18% and at the age of 10-15 years by 33-43%. This is influenced by various factors. Plaque and calculus can be used as indicators of oral hygiene. The more accumulation of plaque and calculus in the oral cavity, this indicates the worse the level of dental and oral hygiene (Newman et al 2018).

Several factors that can affect a person's level of oral and dental hygiene include socioeconomic conditions, age, gender, environment, attitudes, and behaviors related to dental and oral health (Newman et al 2018). Health maintenance behavior is part of health behavior, namely the efforts made by a person to maintain or maintain health so as not to get sick and healing efforts when sick. Health maintenance behaviors include health promotion behavior and disease prevention (Notoatmodjo 2007). The role of behavior is very large on dental and oral health, so a special approach is needed in forming positive behavior towards dental health (Rahayu 2005; Isrofah and Nonik 2014).

Behavior is an important thing that can affect the oral health of individuals or communities. The behavior of maintaining positive oral and dental hygiene, for example the habit of brushing teeth, on the other hand, negative behavior is not brushing teeth regularly, the condition of dental and oral hygiene will be less good which will affect the decline in dental and oral health. The better the behavior of cleaning teeth, the better the level of dental and oral hygiene, on the contrary, the worse the behavior of cleaning teeth, the worse the level of dental and oral hygiene (Warni 2009). The level of dental and oral hygiene of children is related to the child's behavior in maintaining dental and oral hygiene. Children's behavior in maintaining dental and oral hygiene cannot be separated from the environment (Notoatmodjo 2007). Furthermore, an analysis was carried out to see the correlation between knowledge and oral hygiene which can be seen in Table 3.

Table 3. Correlation between variables

Correlation	Indicator	Value
Knowledge– Oral Hygiene	p-value	0,001
	R-value	-0,768
	N	70

Table 3 showed that there was a correlation between knowledge and oral hygiene (p = 0.001) where the strength of the correlation is in the strong category with a negative correlation direction where the higher the knowledge, the lower the OHIS value or the better the oral hygiene or vice versa. OHI-S is an index to measure the area of the tooth surface covered by oral debris and calculus. This OHI-S is the oral hygiene of the respondent assessed from the presence of food debris and calculus (tartar) on the tooth surface using the OHI-S from Green and Vermillion (1964) which is the sum of the debris index (DI) and the calculus index. (CI) (Newman et al 2011).

Poor oral hygiene was caused by the presence of debris and plaque which can demineralize the tooth structure resulting in caries (Shearer et al, 2011). If left untreated, caries will continue to develop, resulting in pulp death and the spread of infection to the periapical tissues, causing pain that interferes with activities. Often this pain is also accompanied by swelling, loss of appetite, weakness, and an increase in body temperature/fever.

Poor oral hygiene can also lead to plaque and calculus. Plaque and calculus contribute to gingivitis, which can develop into periodontal disease, which is characterized by swollen, bleeding, pus-filled gums, bad breath, loose teeth and even loose themselves (Zeng et al, 2015).

Effendi (2006) found the maintenance of children's dental health must involve interaction between children, parents and dentists. The role of parents in children's dental health is as a motivator, educator and facilitator. Motivator is defined as an incentive for children to actively maintain their oral and dental health. Educator means providing health education to instill healthy behavior so that behavioral changes occur as expected to achieve optimal health. Facilitators are defined as role models for children in solving various problems in the health sector that they face on a daily basis. Attitude change is different from behavior change, because attitude is a general evaluation, which means that the form of reaction expressed as an attitude arises based on an evaluation process within the individual that concludes the stimulus in the form of good-bad, positive-negative, pleasant-unpleasant value, which then crystallizes as a potential reaction to the attitude object (Azwar, 2015).

Knowledge or cognitive is a very important domain in shaping one's actions (over behavior). Increased knowledge can lead to changes in perceptions, habits and form one's beliefs. The results of the test of the effectiveness of health knowledge before and after being given treatment showed that the p-value was 0.001 ($p < 0.05$), meaning that it was effective in increasing dental health knowledge. From experience and research, it turns out that a person's behavior based on knowledge, awareness, and a positive attitude will be more lasting than behavior that is not realized by knowledge and awareness (Notoatmodjo, 2010).

IV. Conclusion

The conclusion of this study is that there was a correlation between knowledge and oral hygiene where the better knowledge will be followed by better dental and oral hygiene. Based on this, it is necessary to increase the knowledge of elementary school students in the city of Tomohon so that dental and oral hygiene can be maintained properly. This can be done through outreach efforts on maintaining dental and oral health both at school and at home.

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