

The Relationship between Public Knowledge About Fluorine and Prevention of Dental Caries in Kandang Village, Darul Imarah District, Aceh Besar District

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ABSTRACT

Dental caries is an infectious and multifactorial disease that affects some people. A simple and economical procedure can prevent caries by brushing the teeth with fluoride toothpaste. Using fluoride toothpaste is thought to reduce the incidence of dental caries. However, knowledge about fluoride in reducing dental caries is still limited among the community, so the status of dental caries is still high. Therefore, a study is needed to determine the relationship between public knowledge about fluoride and the prevention of dental caries in Kandang Village, Darul Imarah District, and Aceh Besar District. This study used a cross-sectional approach located in Kandang Village, Darul Imarah District, and Aceh Besar District. The research will be conducted on March 11-17. The population in the study was the entire community in Kandang Village, Darul Imarah District, and Aceh Besar District. Sampling in this study amounted to 68 people using the Slovin formula. Data analysis used univariate and bivariate analysis. The results showed a relationship between public knowledge about fluoride and the prevention of dental caries in the people of Kandang Village, Darul Imarah District, Aceh Besar District, as evidenced by the results of statistical tests with a P value of $0.002 < 0.05$. Public knowledge about fluoride was mainly in the low category. Fifty respondents (73.5%), and the dental caries status of the people of Kandang Village was mainly in the high category, namely 23 respondents (33.8%).

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1. Introduction

Oral disease is one of the most common diseases globally and has a health burden and reduces the quality of life. The most common and consequential oral diseases globally are dental caries (tooth decay), periodontal disease, tooth loss, and cancer of the lips and oral cavity (1). Dental caries are prevalent worldwide and remain a significant public health problem (2). Caries can be prevented mainly by cost-effective, simple procedures, such as brushing with fluoridated toothpaste (3). In addition, changes in lifestyle, eating habits, and socio-demographic factors also increase the prevalence of dental caries (4). Socio-economic status, education level, and poor oral hygiene practices are associated with dental caries (5). Across all age groups, dental caries affects the quality of life, affects the economy of individuals and society causing eating problems, tooth loss and pain, slow language development in children, and absence from school or work (6). The prevalence of dental caries has been of great interest for a long time and is the main subject of many epidemiological studies conducted worldwide. This significant but preventable public health problem interferes with regular food intake, speech, self-esteem, and routine activities that affect a child's overall health. Dental caries is a multifactorial infectious microbial disease of the teeth that results in local dissolution and destruction of calcified tissue that often results in cavitation (7).

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Consumption of sugary foods and beverages significantly impacts an individual's caries experience, both in childhood and in adulthood. High sugar intake increases the number of Mutans Streptococci in the mouth, which in turn increases the chances of tooth decay (8). Based on data obtained from regional health research (9), the percentage of the Indonesian population who had dental and oral health problems in 2013 and 2018 increased from 25.9% to 57.6%. The province of Aceh shows the prevalence of the population with dental and oral problems at 56%, the prevalence of active caries in the Indonesian population in 2018 was 45.3%, and the province of Aceh was 47%. The prevalence of dental caries obtained from data from the Darul Ijarah Public Health Center, Aceh Besar District, from August–November year was 73.18%, periodontal disease was 4.1%, and abscess disease was 9.48%, persistence was 13.4%, with a total of 1488 visits. Visit. From the data above, it can be seen that the number of dental and oral health diseases in the Darul Ijarah Public Health Center. Based on the examination of initial data on 15 people from Kandang village aged 15-44 years, the average result of DMF-T was 4.9 (high criteria) with a caries prevalence of 80%. Therefore, this study aims to determine the relationship between public knowledge about fluoride and the prevention of dental caries in Kandang Village, Darul Ijarah District, and Aceh Besar District.

2. Methods

This research is analytic with a cross-sectional approach to the relationship between public knowledge about fluoride and the prevention of dental caries in Kandang Village, Darul Ijarah District, and Aceh Besar District. This research will be located in Kandang Village, Darul Ijarah District, and Aceh Besar District. The research will be conducted on March 11-17. Population in the study of the entire community in Kandang Village, Darul Ijarah District, Aceh Regency There are 210 people aged 15-44. Sampling in this study amounted to 68 people using the solving formula. Using the Purposive Sampling technique, the sampling is based on the inclusion and exclusion criteria. The inclusion criteria covered the age of 15-45 years because they were easy to communicate with, willing to cooperate, and willing to interview. Exclusion criteria include people who have mental limitations and there are mental disorders. The instruments used to support this research are questionnaires, patient status cards, DMF-T index, and diagnostic sets. The data in this study consisted of primary data and secondary data. Primary data was obtained directly from interviews with respondents using a questionnaire and DMF-T index of each research variable. Secondary data is obtained from the Puskesmas Darul Ijarah, and document the number and name of the Head of the Family from The village secretary of Kandang village, Darul Ijarah sub-district, Aceh Besar district. Data is processed through editing, coding, entry, and cleaning. Analyze data using a Univariate and Bivariate analysis. The univariate analysis aims to describe each research variable in frequency distribution and percentage of each variable of public knowledge about fluoride with dental caries prevention. Bivariate analysis to determine the relationship between variables, namely public knowledge about fluoride and prevention of dental caries, conducted statistical testing with Chi-Square.

3. Results

3.1 Univariate Analysis

Univariate analysis in this study aims to summarize the data set of measurement results so that the data set turns into helpful information. Following. The distribution of the frequency of respondents based on gender in the Kandang Village community can be seen in table 1 below.

TABLE 1
FREQUENCY DISTRIBUTION OF RESPONDENTS BASED ON GENDER IN THE KANDANG VILLAGE COMMUNITY, DARUL IMARAH DISTRICT, ACEH BESAR DISTRICT.

No	Gender	Frequency	Percentage (%)
1.	Man	29	42.6
2.	Woman	39	57.4
	Amount	68	100
1.	15-22	14	20.6
2.	23-30	16	23.5

3.	31-37	27	39.7
4	38-44	11	16.2
	Amount	68	100

Table 1 above shows the number of visitors, 29 respondents (42.6%) and 39 female respondents (57.4%). The Kandang Village community's age is mainly in the 31-37 category as many as 27 people (39.7%).

3.2 Public Knowledge of Fluorine

The following is the frequency distribution of respondents based on knowledge of fluoride in the people of Kandang Village.

TABLE 2.
FREQUENCY DISTRIBUTION OF RESPONDENTS BASED ON COMMUNITY KNOWLEDGE ABOUT FLUORINE IN KANDANG VILLAGE, DARUL IMARAH DISTRICT, ACEH BESAR DISTRICT.

No	Category	Frequency	Percentage (%)
1.	Tall	5	7.4
2.	Currently	13	19.1
3.	Low	50	73.5
	Amount	68	100

Table 2 shows that the most public knowledge about fluoride is in a low category as many as 50 respondents (73.5%). Artinta, community knowledge about fluoride in Kandang Village, Darul Imarah District, and Aceh Besar District is still in the low category.

3.3 Dental Caries Status

Caries status is a condition that describes a person's **caries experience** calculated by DMF-T (Deceyed missing filling teeth) index. The following is the frequency distribution of respondents based on the status of dental caries in the people of Kandang Village.

TABLE 3
FREQUENCY DISTRIBUTION OF RESPONDENTS BASED ON DENTAL CARIES STATUS OF THE PEOPLE OF KANDANG VILLAGE, DARUL IMARAH DISTRICT, ACEH BESAR DISTRICT.

No	Dental caries status	Frequency	Percentage
1.	Very low	6	8.8
2.	Low	5	7.4
3.	Currently	17	25.0
4.	Tall	23	33.8
5.	Very high	17	25.0
	Amount	68	100

Based on table 3 above, it can be seen that the most dental caries status in the high category was 23 respondents (33.8%). In general, it can be seen that the dental caries status in the cage community is still relatively high.

3.4 Bivariate Analysis

The relationship between the frequency of public knowledge about fluoride and Dental Caries Prevention is essential. The distribution of respondents based on the relationship between public knowledge about fluoride and the prevention of dental caries can be seen in the following table.

TABLE 4.
DISTRIBUTION OF RESPONDENTS BASED ON THE RELATIONSHIP BETWEEN KNOWLEDGE OF FLUORIDE AND PREVENTION OF DENTAL CARIES IN THE KANDANG VILLAGE COMMUNITY

No	Knowledge Public About Fluorine	Dental Caries Status										T total	%	Test Statistics		
		Very low		Low		Currently		Tall		Very high						
		F	%	F	%	F	%	F	%	F	%					
1	Low	4	8.0	5	10.0	7	14.0	1	8	36.0	1	6	32.0	50	100	=<0.05 df=10 p=0.002
2	Currently	2	15.4	0	0.0	7	53.8%	3	23.1	1	7.7	13	100			
3	Tall	0	0.0	0	0.0	3	60.0	2	40.0	0	0.0	5	100			
	Total	6	8.8	5	7.4	1	25.0	2	33.8	1	25.0	68	100			
						7		3		7						

Based on the table above, it is known that from 68 respondents, Public knowledge about fluoride with the highest frequency in the low category with high caries status was 18 people (36.0%). Based on the results of the *Chi-Square test*, there is a relationship between Public

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Knowledge of Fluorine and Prevention of Dental Caries with a p-value = 0.002 while 0.05 and df 10, therefore the P value $0.002 < 0.05$. These results confirm a relationship between knowledge of fluoride and the prevention of dental caries in the people of Kandang Village, Darul Imarah District, and Aceh Besar District.

3.5 Discussion

Dental caries is still a significant problem in dental and oral health, and its prevention is more important than its treatment. The study results have shown that public knowledge about fluoride in preventing dental caries in the village of cages is still low. From the interview results, it was also known that many people did not know about the benefits of fluoride and whether the toothpaste they consume daily contains fluoride or not. Many of the public have never heard of fluorine. The low level of public knowledge about fluoride is due to the lack of information obtained by the public about fluorine, its benefits and uses, and the adverse effects caused by consuming excessive fluoride. This has also been proven by research results which state that there is a relationship between knowledge of fluoride and the prevention of dental caries in the people of Kandang Village, Darul Imarah District. Various attempts have been made to reduce dental caries with fluoride.

Fluoride works to control early dental caries in several ways. Due to its anticarcinogenic and antimicrobial properties, fluoride ion (F) has been widely used in treating dental caries (10). Using fluoride and ingredients is an effective way to prevent enamel damage. Fluorine is very important for maintaining healthy teeth because fluoride can help the formation of tooth enamel that is more resistant to decay. Fluorine is also helpful in preventing the process of tooth decay. The decline in caries in developed countries is associated with increased use of fluoride, improved oral hygiene and dietary changes, preventive oral health services provision, and increased dental awareness through training education programs (11)(12). The higher the level of dental exposure during the developmental stage, with increasing fluoride concentration in drinking water, the greater the severity of fluorosis (13). Studies conducted in England show that experience and knowledge of fluoride have determined the severity of dental caries in the community (14). Although multifactorial, caries is a preventable disease, with fluoride as a preventive agent used worldwide. Several models of fluoride use have been developed, each with a recommended concentration, frequency of use, and dosing schedule (15).

Given that the status of dental caries in the cage community is still relatively high and public knowledge about fluoride is low, it is necessary to carry out health promotion and prevention efforts to improve personal and community health through a combination of strategies, including the implementation of behavior change, health education, detection of health risks and improvement and maintenance dental health. The public needs to be given information about dental health using various media. Aids or teaching aids in health education should be arranged based on the principle that the knowledge that exists in every human being is received or captured through the five senses (16)(17). The more senses that are used to receive something, the more and the clearer the meaning or knowledge gained.

4. Conclusion

There is a relationship between public knowledge about fluoride and the prevention of dental caries in the people of Kandang Village, Darul Imarah District, and Aceh Besar District. Public knowledge about fluoride is in a low category, and the dental caries status of the people of Kandang Village is mainly in the high category.

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