

Relationship between Oral Health Status with Knowledge, Attitude, and Behavior of Elementary School Children

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Abstract

The purpose of this study was to assess the relation of oral health status with knowledge, attitude, and behavior among elementary school children in Tallo District, Indonesia. This cross sectional study was performed out among 1233 children who studied at elementary school in Tallo District. DMF-T/df-t index was used to measure oral health status. A structured, interviewer-guided questionnaire was used to measure children knowledge, attitude, and behavior that adapted from World Health Organisation. The 1233 children consisted of 597 males (48.4%) and 636 females (51.6%). There were 58 children aged 6 years (4.7%), 218 children aged 7 years (17.7%), 261 children aged 8 years (21.2%), 238 children aged 9 years (19.3%), 236 children aged 10 years (19.1%), 161 children aged 11 years (13.1%), and 61 children aged 12 years (4.9%). The chi-square test was used to assess the relation of oral health status with knowledge, attitude, and behavior.

There is a significant relationship between oral health status with knowledge, attitude, and behavior of elementary school children ($p < 0.05$). The oral health status of elementary school children is in very low caries category. However, the level of knowledge, attitudes, and behavior can not be said well.

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Introduction

Caries is a disease caused by microbes that attack tooth tissue, characterized by demineralization of inorganic parts and destruction of organic parts of the teeth.¹ Caries affects everyone, age, gender, ethnicity, race, and every level of socioeconomic status.² There is no countries in the world that free from caries. Although, caries prevalence has dropped dramatically in developed countries, it is still a major health public problem in developing countries, including some countries in Asia.³

Oral disease with a high prevalence in Indonesia is caries. Caries prevalence among school children also has increased from 13.7% in 2007 to 42.6% in 2013.⁴ In South Sulawesi,

Indonesia, the mean of DMF-T index of children aged 12 year old was 1.4. Even, the mean of DMF-T index of children aged over 12 year old was 6.0.⁴ This may be due to the low level of knowledge, attitudes, and behavior of children in maintaining their oral health.⁵ Tallo District is one of 14 districts in Makassar City, South Sulawesi. However, Tallo District does not have sufficient health data, especially in oral and dental health of children.⁶

Awareness of the importance of oral and dental health can be seen from the level of knowledge. Children have limited knowledge about oral and dental health that makes them susceptible to caries. Previous studies reported that there was an influence between knowledge that children received about oral health with their attitude and behavior in maintaining oral hygiene.^{7,8,9} Therefore, dental health education should be introduced as early as possible to the children so they can know how to maintain good oral health. In this case, the role of parents as family members is very influential in maintaining oral and dental health children.¹⁰ The impact of an untreated caries can affect the quality of life of

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the child. It can also affect the presence of the child in school.^{11,12,13}

Generally, school children have a high caries risk, because at this age children are less concerned with their oral health, usually have snacks between meals, and consume lots of foods and beverages containing carbohydrates.¹⁴ Therefore, it is important to teach children a good behavior in maintaining oral health to avoid the risk of caries.

Based on the description, the aim of this study was to assess oral health based on knowledge, attitude, and behavior among school elementary school children old in Tallo District, Indonesia.

Materials and methods

This cross sectional study was carried out from April 6, 2017 to April 8, 2017 among children who studied at the elementary school in Tallo District. List of school was obtained from Community Health Center Jumpandang Baru of Makassar, which comprised of 10 elementary schools present in Tallo District, making a population of 3150. Of these 3150 students, 1233 students were included in the study. All included students were aged 6-12 years old, who present at the research location and willing to be examined. The exclusion criterion was uncooperative during examination, not returning the questionnaire, and returns the questionnaire, but not completed.

Variables	n	%
Sex		
Male	597	48.4
Female	636	51.6
Total	1233	100
Age (years)		
6	58	4,7
7	218	17,7
8	261	21,2
9	238	19,3
10	236	19,1
11	161	13,1
12	61	4,9
Total	1233	100

Table 1. Distribution of elementary school children by sex and age.

Oral health status was examined visually using an oral diagnostic tool and measured using a DMF-T/df-t index.^{15,16} Previous research conducted by Raharjo A *et al*¹⁷ in Jakarta, measured knowledge, attitude, and behavior using an Indonesian Oral Health Literacy questionnaire for adolescent. But, in this study, we are using an adapted WHO questionnaire consisting of 10 questions for knowledge, 10 questions for attitude, and 6 questions for behavior to complement previous research.¹⁸

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS) for Windows software (version 23.0; SPSS Inc. Chicago). The chi-square test were used to assess the relation of oral health status with knowledge, attitude, and behavior. The level of significance was set at 0.05.

Results

In Table 1, it can be seen that by sex, there were 597 boys (48.4%) and 636 girls (51.6%). Based on age, there were 58 children aged 6 years (4.7%), 218 children aged 7 years (17.7%), 261 children aged 8 years (21.2%), 238 children aged 9 years (19.3%), 236 children aged 10 years (19.1%), 161 children aged 11 years (13.1%), and 61 children aged 12 years (4.9%).

DMF-T category	n	%
Very low	619	50.2
Low	180	14.6
Moderate	277	22.5
High	157	12.7
Very high	0	0
Total	1233	100

Table 3. Distribution of DMF-T category of elementary school children.

df-t category	n	%
Very low	617	50.0
Low	180	14.6
Moderate	279	22.6
High	157	12.7
Very high	0	0
Total	1233	100

Table 4. Distribution of df-t category of elementary school children.

Based on the data shown in table 2, we can see the distribution of mean values of DMF-T and df-t elementary school age children. There

were 570 children with an average DMF-T score of 2.58 ± 2.18 . This suggests that in 570 children had nearly 3 dental caries-damaged teeth with average DMF-T values falling into the low category. There were also 792 children with an average df-t score of 3.72 ± 2.55 . This shows that in 792 children had nearly 4 dental caries with a mean df-t falling in the medium category.

Category	n	%
Knowledge		
High	264	21,4
Moderate	431	35,0
Low	538	43,6
Total	1233	100
Attitude		
Good	257	20,8
Moderate	430	34,9
Bad	546	44,3
Total	1233	100
Behavior		
Good	379	30,7
Moderate	574	46,6
Bad	280	22,7
Total	1233	100

Table 5. Distribution of knowledge categories, attitudes, and behavior of elementary school children.

Variable	DMF-T category				p
	Very low	Low	Moderate	High	
Knowledge					
High	174	28	30	27	0.00*
Moderate	229	55	100	55	
Low	216	97	147	75	
Attitude					
Good	174	27	40	23	0.00*
Moderate	199	75	98	49	
Bad	246	78	139	85	
Behavior					
Good	229	47	64	42	0.00*
Moderate	289	82	131	78	
Bad	101	51	82	37	

*p < 0.05

Table 7. Relationship between DMF-T categories with knowledge, attitude, and behavior of elementary school children.

Based on the data shown in table 3, it can be seen that the category of DMF-T of elementary school children is in very low category with 619 children (50,2%), followed by moderate category 277 children (22,5%) , low

category as many as 180 children (14,6), high category as many as 157 children (12,7%), and very high category 0%.

Table 4 shows that of all elementary school children there were 617 children (50%) with the category df-t is very low, then 279 children (22.6%) in moderate category, 180 children (14.6%) in low category, 157 children (12.7%) in high category, and no children in very high df-t category (0%).

In Table 5, many of the elementary school children have a low level of knowledge as many as 535 children (43.4%), followed by a moderate level of knowledge of 439 children (35.6%), and a high level of knowledge as many as 259 children (21.0%). Table 5 shows that the most categories of children's attitude aged 6-12 years are in bad category with 548 children (44.4%), moderate category with 421 children (34.1%) and good category with 264 children (21.4%). It can be also seen the behavior categories of elementary school children. There are 580 children (47.0%) in moderate category, at good categories there were 382 children (31.0%), while the bad category there are only 271 children (22.0%).

Table 6 shows the distribution of the mean values of DMF-T and df-t based on the knowledge, attitudes, and behavior of elementary school children. Children with low knowledge had an average DMF-T score of 2.61 ± 2.24 and an average df-t score of 2.81 ± 2.67 . The child with a bad attitude had an average DMF-T score of 2.67 ± 2.33 and an average df-t of 3.89 ± 2.57 . The mean values of DMF-T and df-t children with bad behavior were 3.09 ± 2.75 and 3.99 ± 2.68 .

Variable	df-t category				p
	Very low	Low	Moderate	High	
Knowledge					
High	173	28	31	27	0,00*
Moderate	228	55	101	55	
Low	216	97	147	75	
Attitude					
Good	173	27	41	23	0,00*
Moderate	198	75	99	49	
Bad	246	78	139	85	
Behavior					
Good	228	47	65	42	0,00*
Moderate	288	82	132	78	
Bad	101	51	82	37	

*p < 0,05

Table 8. Relationship between df-t categories with knowledge, attitude, and behavior of elementary school children.

Table 7 shows that there is a significant relationship between the DMF-T category and the knowledge, attitude, and behavior ($p < 0.05$). In the knowledge category there are 174 children in high knowledge category with very low DMF-T category. In the low knowledge category there are 75 children with the high DMF-T category. Similarly, the attitude category, there are 174 children in good attitude category with very low DMF-T category and there are 85 children in bad attitude category with high category of DMF-T. As for the behavior category, there are 229 children in good category with low DMF-T category, whereas the bad category is 37 children who are also in high DMF-T category.

In table 8, there is a significant relationship between df-t categories and knowledge, attitude, and behavior ($p < 0.05$). In the knowledge category there are 173 children with high knowledge category and in very low df-t category. In the low knowledge category there are 75 children in the high df-t category. Similarly, attitude category, there are 173 children with good attitude category and in very low df-t category and there are 85 children with bad attitude category and in high df-t category. As for the behavior category, there are 228 children with good category and very low df-t category, whereas bad category there is 37 children who are also in high df-t category.

Discussion

Half of the total study sample was in very low caries category, both in the DMF-T category and the df-t category. This is in line with previous study conducted by Ahmadzadeh J *et al*¹⁹ reported that 50.7% of the samples are in very low caries category. Study conducted by Garbin CAS²⁰ *et al* also reported similar results that 79.6% of the samples were in very low caries category. This is due to high saliva rate, salivary pH, and buffer capacity in elementary school children old.^{21,22}

At the level of knowledge, there are still many children who have low levels of knowledge. The results of this study are in line with research conducted by Priya M *et al*²³ and Blaggana A *et al*²⁴ that most samples have a low level of knowledge in maintaining oral hygiene and dental health. This is due to the lack of education on how to maintain oral hygiene and dental health in primary schools and the lack of availability of

learning media either poster, audio-visual, or pamphlet that should be able to provide knowledge to children.^{25,26,27}

The results also showed attitudes and behavior of children in maintaining oral hygiene and dental health. Most children do not yet have a good attitude and behavior. The results of this study are in line with research conducted by Kamran A *et al*²⁸. In fact, previous research conducted by Yani RWE²⁹ in Dayak Paramasan rural society tribe in Kabupaten Banjar, Indonesia, reported that all the respondents are classified into bad behavior category. This can happen because the lack of examples of good attitudes and behavior from parents and family members, especially mother, in maintaining oral hygiene and dental health.^{30,31} It can also happen because of low education level, cultural beliefs and practices that might have influence on the oral health.³²

In the results of this study, it can be seen that knowledge, attitudes, and behavior have a significant relationship with oral health status in children. Research conducted by Kawas AS *et al*³³ in Arab also reported that there is a relationship between knowledge, attitudes, and behavior with oral health status. This result shows that knowledge and good habit in maintaining oral hygiene and dental health should be given to children from an early age to avoid caries. The role of parents is necessary in shaping education and good habits in children. In a study conducted by Colak H *et al*³⁴, reported that there was a correlation between parent's knowledge with children's oral health status. Study conducted by Bozorgmehr E *et al*³⁵ also reported that parental behavior, such as tooth brushing is a determinant of children's behavior. Therefore, it is necessary to give dental health education on how to maintain oral hygiene and dental health to parents and children.

Conclusions

There is a significant relationship between dental caries status with knowledge, attitude, and behavior among elementary school children old in Tallo District, Indonesia. The oral health status of elementary school children is in very low caries category.

However, the level of knowledge, attitudes, and behavior can not be said well, so the role of parents and schools in providing

knowledge on how to maintain oral health for children is needed to avoid the risk of caries.

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Declaration of Interest

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Age	DT		MT		FT		DMFT		dt		ft		dft	
	n	Mean±SD	N	Mean±SD	n	Mean±SD	n	Mean±SD	n	Mean±SD	N	Mean±SD	n	Mean±SD
6	11	2,36±1,80	4	1,25±0,50	0	0	12	2,58±2,35	49	5,88±3,89	0	0	49	5,88±3,89
7	62	3,26±2,95	10	2,10±1,45	0	0	63	3,54±3,38	170	4,63±2,71	1	2,00±0,00	170	4,64±2,72
8	83	2,18±1,76	7	1,14±0,37	0	0	84	2,25±1,83	207	3,79±2,38	1	2,00±0,00	207	3,80±2,39
9	131	2,60±2,23	14	1,57±1,02	1	1,00±0,00	134	2,72±2,34	153	3,48±2,17	2	1,00±0,00	154	3,47±2,17
10	122	2,16±1,54	10	1,40±0,70	2	2,50±0,71	128	2,21±1,61	134	2,70±1,78	0	0	134	2,70±1,78
11	100	2,75±1,99	10	1,40±0,70	1	4,00±0,00	104	2,82±2,02	64	2,30±1,41	1	2,00±0,00	64	2,33±1,40
12	45	1,96±1,35	1	1,00±0,00	0	0	45	1,98±1,36	14	2,57±1,99	0	0	14	2,57±1,99
Total	554	2,49±2,04	56	1,52±0,93	4	2,50±1,29	570	2,58±2,18	791	3,71±2,55	5	1,60±0,55	792	3,72±2,55

Table 2. Distribution of mean values of DMF-T and df-t in elementary school children.

Category	DT	MT	FT	DMF-T	dt	ft	df-t
	Mean±SD						
Knowledge							
High	2,49±1,84	1,08±0,29	3,00±0,00	2,55±1,85	3,54±2,46	1,50±0,70	3,56±2,48
Moderate	2,50±2,28	1,35±0,75	2,50±2,12	2,58±2,35	3,60±2,37	2,00±0,00	3,62±2,37
Low	2,47±1,95	1,87±1,15	2,00±0,00	2,61±2,24	3,85±2,55	1,00±0,00	2,81±2,67
Attitude							
Good	2,70±2,32	1,38±0,81	2,33±1,53	2,77±2,35	3,59±2,72	1,50±0,70	3,61±2,73
Moderate	2,25±1,66	1,50±1,06	3,00±0,00	2,33±1,80	3,53±2,42	2,00±0,00	3,55±2,42
Bad	2,54±2,13	1,71±0,83	2,50±1,29	2,67±2,33	3,90±2,57	1,00±0,00	3,89±2,57
Behavior							
Good	2,61±2,24	1,38±0,81	0,01±0,20	2,70±2,29	3,59±2,72	1,75±0,50	3,62±2,73
Moderate	2,17±1,56	1,50±1,01	0,01±0,15	2,26±1,70	3,63±2,34	1,00±0,00	3,63±2,34
Bad	2,96±2,46	1,71±0,83	0,00±0,00	3,09±2,75	4,00±2,69	1,60±0,55	3,99±2,68

Table 6. Distribution of mean values of DMF-T and df-t based on the knowledge, attitude, and behavior of elementary school children.

References

- Karpinski TM, Szkaradkiewicz AK. Microbiology of dental caries. *Journal of Biology and Earth Sciences*. 2013; 3(1): 21-4.
- Popoola BO, Denloye OO, dan Iyun OI. Influence of parental socioeconomic status on caries prevalence among children seen at the university college hospital, Ibadan. *Ann Ibd. Pg. Med*. 2013; 11(2): 81-6.
- Duangthip D, Gao SS, Lo ECM, Chu HC. Early childhood caries among 5- to 6-year-old children in southeast asia. *International Dental Journal*. 2016; 67: 98-106.
- Trihono. Riset kesehatan dasar (Risikesdas) nasional 2013. Indonesia: Badan Penelitian dan Pengembangan Kesehatan Departemen Kesehatan RI. 2013:100-1,118.
- Suprabha BS, Rao A, Shenoy R, Khanal S. Utility of knowledge, attitude, and practice survey, and prevalence of dental caries among 11- to 13-years-old children in an urban community in India. *Glob Health Action*. 2013; 6: 1-7.
- Kecamatan Tallo dalam angka 2016. Indonesia: Badan Pusat Statistik Kota Makassar. 2016: 1-3
- Shanbhog R, Raju V, Nandlal B. Correlation of oral health status of socially handicapped children with their oral health knowledge, attitude, and practices from India. *J Nat Sci Biol Med*. 2014; 5(1): 102.
- Santiago BM, Valenca AMG, Vettore MV. The relationship between neighborhood empowerment and dental caries experience: a multilevel study in adolescents and adults. *Revista Brasileira de Epidemiologia*. 2014; 7(2): 15-28.
- Haque SE, Rahman M, Itsuo K, et al. Effect of a school-based oral health education in preventing untreated dental caries and increasing knowledge, attitude, and practices among adolescents in Bangladesh. *BMC Oral Health*. 2016; 16(44): 1-10.
- Castilho ARF, Mialhe FL, Barboza TS, Puppim-Rontani RM. Influence of family environment on children's oral health: a systematic review. *J Pediatr (Rio J)*. 2013; 89(2): 116-23.
- Tandon S, Acharyat S. The effect of early childhood caries on the quality of life of children and their parents. *Contemporary Clinical Dentistry*. 2011; 2(2): 98-101.
- Grund K, Goddon I, Schüler IM, Lehmann T, dan Heinrich-Weltzien R. Clinical consequences of untreated dental caries in German 5- and 8-years-old. *BMC Oral Health*. 2015; 140: 1-11.

13. Seirawan H, Faust S, Mulligan R. The impact of oral health on the academic performance of disadvantaged children. *American Journal of Public Health*. 2012; 102(9): 1729-34.
14. Karki S, Wangdu K, Kunwar N, Namgyal K. Prevalence of dental caries among 6-12 years old tibetan children residing in Nepal. *Int J Dent Med Res*. 2015; 1(6): 51-3.
15. Marya CM. A textbook of public health dentistry. New Delhi: Jaypee Brothers Medical Publishers. 2011: 204-6.
16. Veiga N, Pereira C, Amaral O. Prevalence and determinants of dental caries in a sample of schoolchildren of Satao, Portugal. *Rev Port Estomatol Med Cir Maxilofac*. 2014; 54(4): 215-6.
17. Rahardjo A, Adinda S, Nasia AA et al. Oral health literacy in Indonesian adolescent. *J Int Dent Med Res*. 2015; 8(3): 00-0.
18. Petersen PE, Baez RJ. Oral Health Survey 5th edition. World Health Organization. 2013: 120-7.
19. Ahmadzadeh J, Rezaeian S, Esmahili-Sani A, et al. Oral health status and behaviors of children aged 6-12 years old: A cross-sectional study. *Ann Public Health Res*. 2015; 2(2): 1-5.
20. Garbin CAS, Soares GB, Docusse FRM, Garbin AJI, Arcieri RM. Oral health education in school: parents' attitudes and prevalence of caries in children. *Rev Odontol UNESP*. 2015; 44(5): 285-91.
21. Joshi PS, Ahale S, Joshi SG, Chougule M, Hongal B. Analysis of salivary flow rate, buffering capacity, and isolation of streptococcus mutans using selective MSKB media in caries active and caries free school children. *Research & Reviews: Journal of Dental Sciences*. 2016; 4(4): 1-9.
22. Kuriakose S, Sundaresan C, Mathai V, Khosla E, Gaffoor F. A comparative study of salivary buffering capacity, flow rate, resting pH, and salivary immunoglobulin A in children with rampant caries and caries-resistant children. *J Indian Soc Pedod Prev Dent*. 2013; 31: 69-73.
23. Priya M, Devdas K, Amaral D, Venkatachalapathy A. Oral health, attitudes, knowledge and practice among school children in Chennai, India. *J Educ Ethics Dent*. 2013; 3(1): 26-33.
24. Blaggana A, Grover V, Anjali, et al. Oral health knowledge, attitude and practice behaviour among secondary school children in Chandigarh. *Journal of Clinical and Diagnostic Research*. 2016; 10(10): 1-6.
25. Gambhir RS, Sohi RK, Nanda T, Sawhney GS, Setia S. Impact of school based oral health education programmes in India: a systematic review. *Journal of Clinical and Diagnostic Research*. 2013; 7(12): 3107-3110.
26. Vozza I, Guerra F, Marchionne M, Bove E, Corridore D, Ottolenghi L. A multimedia oral health promoting project in primary schools in central Italy. *Annali di Stomatologia*. 2014; 5(3): 87-90.
27. Sanadhya YK, Thakkar JP, Divakar DD, et al. Effectiveness of oral health education on knowledge, attitude, practice, and oral hygiene status among 12-15-year-old schoolchildren of fishermen of Kutch district, Gujarat, India. *Int Marit Health*. 2014; 65(3): 99-105.
28. Kamran A, Bakhteyar K, Heydari H, Lotfi A, Heydari A. Survey of oral hygiene behaviors, knowledge and attitude among school children: a cross-sectional study from Iran. *International Journal of Health Sciences*. 2014; 2(2): 83-95.
29. Yani RWE. Behavior of maintaining dental and oral health among dayak paramasan tribe in kabupaten banjar, south kalimantan. *J Int Dent Med Res*. 2016; 9(3):169-172.
30. Jain R, Oswal KC, Chiguppi R. Knowledge, attitude, and practices of mother toward their children's oral health: a questionnaire survey among subpopulation in Mumbai (India). *Journal of Dental Research and Scientific Development*. 2014; 1(2): 40-5.
31. Singhal DK, Archarya S, Thakur AS. Maternal knowledge, attitude, and practices regarding oral health of preschool children in Udupi taluk, Karnataka, India. *J Int Dent Med Res*. 2017; 10(2): 270-7.
32. Vivek S, Jain J, Simon SP, Battur H, Tikare S, Mahuli A. Understanding Oral Health Beliefs and Behavior among Paniyan Tribals in Kerala, India. *J. Int Oral Health*. 2012; 4(2): 23-8.
33. Kawas AS, Fakhruddin KS, Rehman BU. A comparative study of oral health attitudes and behavior between dental and medical students; the impact of dental education in united arab emirates. *J Int Dent Med Res*. 2010; 3(1): 6-10.
34. Colak H, Dulgergil CT, Dalli M, Hamidi MM. Early childhood caries update: a review of causes, diagnoses, and treatments. *J Nat Sci Biol Med*. 2013; 4(1): 29-38.
35. Bozorgmehr E, Haijzamani A, Mohammadi TM. Oral health behavior of parents as a predictor of oral health status of their children. *ISRN Dentistry*. 2013; 2013: 1-6.