



Determinants of Implementation of Dental Health Promotion in Elementary School Children: Study on Teachers and Parents

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Abstract

Dental and oral health has an important role and impact on general health conditions and child development. One of the efforts to prevent dental disease early in children can be done through promotion and education about children 's dental health to parents and teachers as the closest people to the child. The purpose of this study is to determine the determinants of the implementation of dental health promotion by teachers and parents in elementary school children in Aceh Besar District. The research design method is observational analytic with a cross-sectional study approach. The subjects in this study were 110 teachers and 110 parents of elementary school children that carried out by purposive sampling. Data collection was carried out directly from respondents using a validated questionnaire. The statistical tests used were the chi square test and the logistic regression test. The results of this study indicate that the factors of knowledge, attitude, action, availability of facilities and infrastructure, motivation and participation of teachers and parents have a significant influence on the implementation of dental health promotion in elementary school children. In the subject of teachers, the most dominant variables influencing the implementation of dental health promotion in children are the availability of facilities and infrastructure (p = 0.004, Exp (B) = 5.704) and motivation (p = 0.030, Exp (B) = 2.914). In the subject of parents, the most dominant variables are participation (p = 0.000, Exp (B) = 12.803) and motivation (p = 0.001, Exp (B) = 8.899). Based on the results of the study, it can be concluded that the availability of facilities, participation, motivation and knowledge from parents and teachers are key factors in the success of implementing dental health promotion in elementary school children. Holistic interventions and approaches are needed, so as to provide a positive impact on the implementation of dental health promotion in elementary school children.

Keywords: Dental, Health promotion, Teachers, Parents

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I. BACKGROUND

Dental and oral health has an important role and impacts on the general

health condition of individuals (Chimbinha et al., 2023). Although dental and oral diseases do not cause death

directly, they can cause decreased nutritional status, sleep disorders, impaired concentration in learning and reduced frequency of children's attendance at school or children not attending school due to toothache. This can lead to decreased productivity and quality of life for children (Batool et al., 2020) (Singh & Talmale, 2023).

Dental and oral health problems in most developing countries are dental caries that attack school-age children, adolescents and adults. Data from the World Health Organization (WHO) in 2022, shows that almost 3.5 billion people worldwide have experienced dental and oral health problems. Globally, an estimated 2 billion people suffer from caries in permanent teeth and 514 million children experience caries in their primary teeth (WHO, 2022).

The results of the 2018 Basic Health Research (Riskesdas) stated that the prevalence of dental caries in Indonesia has increased sharply with the national prevalence of dental and oral health problems reaching 57.6% and only 10.2% accessing dental health services. The prevalence of caries in children aged 3-4 years was 81.1%, aged 5-10 years was 92.6% and aged 11-14 years was 73.4%. The proportion of dental health problems in

Aceh Province reached 55.34%, while in children over 3 years of age the proportion of dental health problems reached 55.4%, with the habit of brushing teeth of 93.6%, but the behavior of brushing teeth at the right time and technique was only 2.8% (Riskesdas, 2018).

Based on the results of a study conducted by Andriani, et al. (2019) at an elementary school in Aceh Besar district, it showed that 53.8% of children had poor oral hygiene status. The highest children's dental health maintenance behavior was in the poor category, which was 63.8%, but there had not been any continuous and integrated promotive, preventive efforts in efforts to prevent dental and oral diseases in school children.

Dental health in elementary school children should be a priority, because the development of dental disease in children is more progressive than in adult teeth (Mbawalla et al., 2023). Children with dental caries and high caries experience will feel this impact on their oral health-related quality of life more strongly (Corrêa-Faria et al., 2022).

Early prevention of dental caries can be done through promotion and education about children's dental health to parents and teachers as the closest people to the child (Naidu, et al., 2020). Increasing

knowledge, understanding, motivation and participation of parents and teachers in promoting dental health in children can be used as an alternative in order to reduce the number of dental and oral diseases in children (Karamehmedovic et al., 2021) (Satish et al., 2017).

Dental health promotion is a very important aspect in efforts to convey information and education regarding the importance of dental and oral health (Merlya et al., 2023). Dental health promotion is very necessary in the process of forming proper dental health maintenance behavior and can be an effective source of knowledge in motivating children to maintain their dental and oral health properly (Hosseini et al., 2017; Ghaffari, et al., 2018).

Schools are a very effective place for implementing dental health promotion activities (Bramantoro et al., 2021). Teachers are the best promoters in providing education and promotion of dental health to children (Akeru et al., 2022). Teachers have a key role or are key persons in conveying information and education to children about the importance of maintaining dental health and collaborating with parents in preventing dental caries in children

(Baltacı et al., 2019; Tharanga & Ketheeswaran, 2021).

Parents also have an important role in maintaining the dental health of school-age children. Parents' concern for their children's dental health can be seen through their attitudes and attention to their children's dental health. The role of parents is greatly influenced by the level of education and knowledge that determines the good or bad behavior of parents in instilling healthy behavior in children (Tung & Thompson, 2021). Knowledge about children's dental health is also very important for parents, especially mothers (Bogovska-gigova & Kabaktchieva, 2021). Parents are expected to provide accurate information about their children's dental health and play an active role in efforts to prevent and manage dental caries in children (Pakkhesal et al., 2021)

The implementation of dental health promotion has been carried out by dental health workers, but has not involved the role of teachers and parents to the maximum (Reddy, 2019). Information about maintaining children's dental and oral health is still very minimal for children, teachers and parents, so the involvement of teachers and parents is needed in implementing dental health promotion, considering the still high number of cases

of dental disease in children (Mufizarni & Reca, 2024).

Dental health education delivered by teachers at school and parents at home to children is expected to be able to change unhealthy behaviors to healthier ones, so that it can affect the child's dental health status later (Shubayr et al., 2019) (Alshemari et al., 2021). The implementation of dental health promotion has been carried out both in schools and in the community. However, currently there has not been much analysis related to the factors that influence teachers and parents in implementing dental health promotion in elementary school children.

2. METHODS

The research design used in this study is observational analytical research with a cross-sectional study approach. The population in this study were elementary school teachers and parents of children in 6 elementary schools in Aceh Besar Regency in June to August 2024. The determination of the number of samples in this study used the Lameshow et.al (1997) with a confidence level of 95%. Based on the formula, the number of samples obtained was 100 respondents, in this study the sample was increased by 10% to anticipate

incomplete questionnaires and research data, so that the number of samples became 110 teachers and 110 parents of elementary school children. The sampling technique was carried out by purposive sampling, namely the selection of teacher and parent samples based on the determination of the school area by the Technical Implementation Unit of the Aceh Besar District Education Office. This study was assisted by one dentist and three nurses from the School Dental Health Program.

Data collection was carried out directly from respondents using a questionnaire that had been validated by a team of experts from the Department of Dental Health. The research questionnaire used in the study consisted of two parts, namely the first part, which included questions about the characteristics of the respondents and the second part included question items about knowledge, attitudes, actions, availability of facilities, motivation and participation as well as the implementation of dental health promotion in children at school and at home.

Data analysis using SPSS 22.0 for Windows software. Statistical tests used univariate analysis, bivariate analysis using the Chi Square Test with a 95% confidence level to determine the relationship or

correlation between two variables and multivariate analysis using logistic regression test to determine the most dominant factors influencing dental health promotion by teachers and parents.

This research has passed the ethical test from the ethics commission of the Faculty of Nursing, Syiah Kuala University,

Banda Aceh with research code number I130014060524 dated June 14, 2024.

3. RESULTS

The characteristics of respondents observed in this study include age, parents' occupation and teacher's length of service. The distribution of respondent characteristics can be seen in table 1.

Table 1. Frequency Distribution of Respondents by Age, Parents' Occupation and Length of Service of Elementary School Teachers in Aceh Besar District in 2024

Characteristic	Category	Teacher		Parent	
		f	%	f	%
Age	<38 Years	74	67,3	54	49,1
	≥38 Years	36	32,7	56	50,9
Work	Work	-	-	46	41,8
	Doesn't work	-	-	64	58,2
Working Time	1-5 years	50	45,5	-	-
	>5 years	60	54,5	-	-
	Total	110	100,0	110	100,0

Based on the table, it shows that most of the respondents of elementary school teachers in Aceh Besar Regency in 2024 were under 38 years old, which was 67.3%. Meanwhile, for respondents of parents of children under 38 years old and those aged 38 years or older were almost balanced, with 54 people (49.1%) under 38 years old and 56 people (50.9%) aged 38 years or older.

Regarding the work of parents (mothers), the data shows that most respondents are unemployed, which is 58.2% and only 41.8% of parents are recorded as having jobs. Furthermore, the length of service of elementary school teacher respondents in Aceh Besar Regency in 2024 is dominated by teachers with a work period of more than 5 years, which is 54.5%.

Table 2. Frequency Distribution of Respondents Based on Knowledge, Attitude, Action, Availability of Facilities and Infrastructure, Motivation, Teacher and Parent Participation and Implementation of Dental Health Promotion in Elementary Schools in Aceh Besar District

Variables	Teacher		Parent	
	f	%	f	%
Knowledge				
Good	59	53,6	52	47,3
Not enough	51	46,4	58	52,7
Attitude				
Positive	53	48,2	35	31,8
Negative	57	51,8	75	68,2
Action				
Good	48	43,6	37	33,6
Less Good	62	56,4	73	66,4
Availability of facilities and infrastructure				
Available	38	34,5	30	27,3
Not available	72	65,5	80	72,7
Motivation				
High	33	30,0	38	34,5
Low	77	70,0	72	65,5
Participation				
Good	39	35,5	36	32,7
Less Good	71	64,5	74	67,3
Implementation of dental health promotion				
Good	51	46,4	41	37,3
Less Good	59	53,6	69	62,7

Table 2 presents data on the frequency distribution of respondents based on variables, namely knowledge, attitudes, actions, availability of facilities and infrastructure, motivation, teacher and parent participation and the implementation of dental health promotion in elementary school children in Aceh Besar District. The data shows that the majority of teachers or 70.0% of teachers have low motivation with the availability of facilities of 34.5% to support

the implementation of dental health promotion in schools. From the parents' perspective, only 31.8% have a positive attitude and 72.7% of parents do not have the facilities to support the implementation of dental health promotion in children at home. Regarding the implementation of dental health promotion, more than half of the teachers (53.6%) and parents (62.7%) considered that the implementation of dental health promotion in schools and at home was still

not carried out properly. Overall, the data in Table 2 shows that there are still many aspects that need to be improved related to

dental health promotion in elementary schools in Aceh Besar District, both from the teachers' and parents' perspectives.

Table 3. Relationship between Knowledge, Attitude, Action, Availability of Facilities and Infrastructure, Motivation, Teacher and Parent Participation with the Implementation of Dental Health Promotion in Elementary Schools in Aceh Besar District

Variables	Implementation of Dental Health Promotion by the teacher					Implementation of Dental Health Promotion by Parents						
	Good		Not enough		P value	OR (95% CI)	Good		Not enough		P value	OR (95% CI)
	N	%	n	%			n	%	n	%		
Age												
<38 Years	33	61,1	21	38,9	0,004*	3,31 (1,51-7,26)	33	44,6	41	55,4	0,039*	2,81 (1,13-6,99)
≥38 Years	18	32,1	38	67,9			8	22,2	28	77,8		
Working Time												
1-5 Years	31	62,0	19	38,0	0,005*	3,26 (1,49-7,14)						
>5 Years	20	33,3	40	66,7								
Type of Work												
Work							26	56,5	20	43,4	0,001*	4,24 (1,86-9,65)
Doesn't work							15	23,4	49	76,6		
Knowledge												
Good	35	59,3	24	40,7	0,006*	3,19 (1,45-7,00)	28	53,8	24	46,2	0,001*	4,03 (1,77-9,20)
Not good	16	31,4	35	68,6			13	22,4	45	77,6		
Attitude												
Positive	33	62,3	20	37,7	0,002*	3,57 (1,62-7,85)	19	54,3	16	45,7	0,021*	2,86 (1,24-6,56)
Negative	18	31,6	39	68,4			22	29,3	53	70,7		
Action												
Good	31	64,6	17	35,4	0,001*	3,82 (1,72-8,48)	30	81,1	7	18,9	0,000*	24,15 (8,51-68,55)
Not good	20	32,3	42	67,7			11	15,1	62	84,9		
Availability of Facilities and infrastructure												
Available	26	68,4	12	31,6	0,002*	4,07 (1,76-9,42)	28	93,3	2	6,7	0,000*	72,15 (15,27-34,8)
No	25	34,7	47	65,3			13	16,2	67	83,8		
Motivation												
High	21	63,6	12	36,4	0,030*	2,74 (1,17-6,37)*	31	81,6	7	18,4	0,000*	27,45 (9,53-29,07)
Low	30	39,0	47	61,0			10	13,9	62	86,1		
Participation												
Good	26	66,7	13	33,3	0,003*	3,68 (1,61-8,39)	32	88,8	4	11,1	0,000*	45,51 (14,03-17,03)
Not enough	25	35,2	46	64,8			9	12,2	65	87,4		

* 95% confidence level

Based on the data analysis in Table 3, it shows that all variables in this study have a significant relationship with the outcome. In the subject of teachers, the variable of teacher actions has a significant relationship with the outcome, with an OR value of 3.82 (95% CI: 1.72-8.48). This

shows that teachers who take actions that support the implementation of dental health promotion have a 3.82 times higher chance of achieving the expected outcome compared to teachers who take less supportive actions. The availability of facilities and infrastructure also plays an

important role, with an OR value of 4.07 (95% CI: 1.76-9.42), meaning that teachers who are supported by adequate facilities and infrastructure are 4.07 times more likely to achieve the desired outcome compared to teachers who have limited facilities and infrastructure in dental health promotion in schools.

From the parents' perspective, the participation factor in the implementation of dental health promotion significantly influences the outcome, with an OR value of 45.51 (95% CI: 14.03-17.03). Likewise, the availability of facilities and infrastructure has a large influence, with an

OR value of 72.15 (95% CI: 15.27 - 34.8), meaning that parents who are supported by adequate facilities and infrastructure are 72.15 times more likely to implement dental health promotion at home optimally. Parents with good knowledge, attitudes, actions and motivation tend to implement dental health promotion for their children more optimally. Overall, the results of this bivariate analysis indicate that factors such as knowledge, attitudes, actions, availability of facilities and infrastructure, motivation, and participation of teachers and parents have a significant influence on achieving the expected outcome.

Table 4. Most Dominant Factors Influencing the Implementation of Dental Health Promotion in Elementary School Children in Aceh Besar District

Variables	Teacher		Parent	
	Say.	Exp(B)	Say.	Exp(B)
Age	0,019	3,410	0,260	0,712
Work			0,728	2,691
Working Time	0,280	1,750		
Knowledge	0,11	3,470	0,034	5,575
Attitude	0,22	3,072	0,307	2,521
Action	0,509	0,665	0,404	1,117
Availability of facilities and infrastructure	0,004	5,704	0,026	6,497
Motivation	0,030	2,914	0,001	8,899
Participation	0,042	2,794	0,000	12,803

Table 4 shows that for teacher subjects, the most dominant factor influencing the implementation of dental health promotion in schools is the availability of facilities and infrastructure, with a significance value of $p = 0.004$ and an Exp (B) value of 5.704. This means that

teachers who are supported by the availability of adequate facilities and infrastructure have a 5.704 times higher chance of implementing dental health promotion in elementary schools compared to teachers who have limited facilities and infrastructure. In addition, the teacher

motivation factor was also proven to be significant ($p = 0.030$) with an Exp (B) value of 2.914, indicating that teachers with high motivation are 2.914 times more likely to implement dental health promotion compared to teachers who are less motivated. The teacher's age factor also has a significant effect ($p = 0.019$) with an Exp (B) value of 3.410, meaning that teachers with younger ages tend to be more active in implementing dental health promotion.

In parents, the most dominant factor is participation, with a significance value of $p = 0.000$ and an Exp (B) value of 12.803. This indicates that parents who actively participate have a 12.803 times higher chance of supporting the implementation of dental health promotion in children, compared to parents who participate less. Furthermore, parental motivation is also proven to be a significant factor ($p = 0.001$) with an Exp (B) value of 8.899, meaning that parents who are highly motivated are 8.899 times more likely to be involved in dental health promotion compared to parents who are less motivated. Parental knowledge also shows a significant influence ($p = 0.034$) with an Exp (B) value of 5.575, indicating that parents with better knowledge tend to be more active in participating in dental health promotion in children. Overall, the results of this analysis indicate that factors such as the availability

of facilities and infrastructure, motivation, participation and knowledge are the most dominant factors in supporting the implementation of dental health promotion in elementary schools in Aceh Besar Regency, both from the perspective of teachers and parents. Efforts to improve the quality of dental health promotion need to consider these factors.

4. DISCUSSION

Dental health promotion in elementary schools is an important effort to instill awareness and habits of maintaining dental health in children. Children from an early age (Hosseini et al., 2017). The findings in this study indicate that the availability of facilities has a significant impact on the implementation of dental health promotion in elementary school children. Complete and well-functioning facilities and infrastructure will make it easier for teachers to carry out various dental health promotion activities, such as the availability of dental health promotion facilities and learning media that will help teachers in delivering dental health education materials effectively (Reddy, 2019). In addition, the completeness of facilities and infrastructure can also encourage active student participation in dental health promotion programs, so that the goals of dental health promotion in

schools can be achieved more optimally (Alufa & Lucero-Prisno, 2022). This will ultimately increase the effectiveness of dental health promotion programs in school children.

In addition to the availability of facilities and infrastructure, other factors that most influence the implementation of dental health promotion in elementary schools are motivation and participation. Strong motivation and participation from teachers and parents play an important role in encouraging the success of dental health promotion programs implemented in the school environment and at home (Cyriac et al., 2023; Aldowah et al., 2023). Parents with high motivation will be more enthusiastic in supporting efforts to improve their children's dental health. They will actively monitor and ensure that their children carry out routine dental care at home, and encourage children to participate in dental health promotion activities held at school. Motivated parents will also voluntarily cooperate and participate with the school in developing and implementing effective dental health promotion programs (Tolvanen et al, 2017).

On the other hand, teachers who have strong motivation will be more enthusiastic in designing and implementing dental health promotion activities in schools. They will try to find

innovations and interesting delivery methods so that the counseling material can be delivered effectively. Motivated teachers will also continuously monitor the development of children's dental health and conduct periodic evaluations of the implementation of dental health promotion. High motivation from parents and teachers will strengthen each other and encourage children's active participation in efforts to maintain their dental health. When children get support and positive role models from parents and teachers, they will be more motivated to implement healthy living behaviors in the field of dental health (Firouzeh et al., 2023).

Knowledge factors play a very important role in increasing motivation and participation of teachers and parents, especially in efforts to provide dental health information and provide facilities for dental health promotion in children (Satish et al., 2017; Achalu et al., 2019). Good knowledge of dental health can help teachers and parents understand the importance of maintaining children's dental health from an early age. Efforts to increase the knowledge of both parties are strategic steps that must be taken to ensure that the implementation of dental health promotion can run effectively and have a positive impact on children's dental health.

This will ultimately affect the success of the implementation of dental health promotion in the school environment and at home (Coll et al., 2017).

The results of Kaushik & Sood's study, (2023) concluded that parents who have good knowledge about children's dental health will provide support in developing healthy habits in maintaining their children's dental health by modeling healthy behavior. Researchers assume that parents with good knowledge tend to be more aware of their role in shaping children's behavior and habits in maintaining dental and oral hygiene. Parents will be more proactive in providing appropriate and interesting education for children, supporting dental health promotion at home, for example by ensuring that children brush their teeth regularly, taking children for regular dental check-ups, and reminding them of the importance of a healthy low-sugar diet.

Teachers who have adequate knowledge about dental and oral health will also be better prepared to play an active role in dental health promotion activities in schools (Ghaffari et al., 2021). The involvement of competent teachers will be very helpful in instilling the habit of maintaining dental and oral health in children (Aldowah et al., 2023).

Knowledge can underlie the emergence of positive attitudes, actions and encourage more active involvement from teachers and parents in supporting the implementation of optimal dental health promotion (Syada et al., 2021). The results of this analysis indicate that positive attitudes and actions from teachers and parents are important factors in supporting the implementation of dental health promotion. Therefore, efforts to increase knowledge, awareness, and support from teachers and parents of students need to be considered in order to increase their involvement in dental health promotion activities in the school and home environments.

The results of this study are in line with those conducted by Baltacı et al. (2019) which showed that knowledge, attitudes and actions towards dental and oral health promotion have an important role in the implementation of dental health promotion. More positive attitudes and actions towards the implementation of health promotion tend to be more involved in integrating dental health promotion activities into their daily practices.

Collaboration between parents and schools will ensure that dental health promotion programs can run effectively. Parents can share information and input that is useful for schools in developing

dental health promotion strategies that are appropriate to the needs and characteristics of their children. Smooth communication between parents and schools will also facilitate monitoring and evaluation of the implementation of these activities (Alshemari et al, 2021). Optimal parental involvement will make a significant contribution to efforts to instill dental health maintenance habits in children (Bogovska-gigova & Kabaktchieva, 2021).

Teachers have a strategic position in conveying dental health information and interacting directly with children every day so that they have the opportunity to instill good understanding and habits of dental care. Teachers who actively participate in dental health promotion can be role models and motivate students to adopt healthy living behaviors. Teacher involvement also helps ensure the consistency of health messages conveyed to children (Akeru et al., 2022).

Parents, especially mothers, are the closest environment for children. They have a great influence in shaping children's habits and behaviors, including in terms of dental health care. Parents who actively participate in dental health promotion can ensure that their children receive appropriate and consistent education. Parents can also encourage and monitor the

implementation of healthy living behaviors related to dental health at home (Tolvanen, 2017; Pakkhesal et al., 2021).

Active involvement from both teachers and parents can create a strong synergy in dental health promotion efforts. Teachers and parents can coordinate with each other to reinforce messages and ensure that children receive consistent information at school and at home. This collaboration can increase the effectiveness of dental health promotion programs and encourage the formation of good dental care habits in children.

5. CONCLUSION

Based on the results of the study and discussion, it can be concluded that the factors of knowledge, attitude, action, availability of facilities and infrastructure, motivation, and participation of teachers and parents have a significant influence on the implementation of dental health promotion in elementary school children. The most dominant factors influencing teachers and parents in the implementation of dental health promotion are the availability of facilities, participation, motivation and knowledge. The availability of adequate facilities and infrastructure is a key factor that needs to be considered in efforts to support the implementation of effective dental health

promotion. Provision of supporting facilities such as media and dental health promotion props will have a positive impact on increasing knowledge, attitudes, motivation and participation of teachers and parents, so that the goals of dental health promotion in children can be achieved more optimally. A holistic approach that includes social, economic, environmental and psychological determinants is needed to increase the role of teachers and parents in promoting dental health in children comprehensively.

AUTHOR CONTRIBUTIONS

The author contribute all research activity such as conceptualization, data curation, analysis, writing & editing, manuscript revisions.

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CONFLICT OF INTEREST

The authors declare no conflict of interest for this publication.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the

corresponding author upon reasonable request.

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