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Overview of dental health behavior change strategies for preschool age children in Jelbuk District Jember Regency

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Abstract

Introduction: Dental health problems in Jember Regency amounted to 94,439 cases. Behavioral factors play an important role in influencing oral health status, as evidenced by the correct tooth-brushing behavior of the Indonesian population, which has increased from 2.8% in 2018 to 6.2% in 2023. Jelbuk Sub-district is one of the areas with the highest prevalence of caries and is ranked third in Jember Regency. Dental health problems in Jelbuk District, especially rampant caries and Early Childhood Caries (ECC) in pre-school children, are caused by low parental knowledge. This study aims to determine strategies for changing dental health behavior in pre-school children, which are classified as compliance (compulsion), identification (imitating), or internalizing (habitual).

Methods: This research was conducted in the working area of the Puskesmas and Kindergarten in Jelbuk District, Jember Regency, from July to October 2024. The methodology used in this study was descriptive observational with a cross-sectional approach. The study population included 268 children aged 3-6 years, selected through purposive sampling. Data were obtained through questionnaires regarding preschool children's dental health behavior and behaviour change strategies.

Result: Most preschool children have "fair" dental health behavior (65.7%). Based on age group, "fair" behavior was most dominant in children aged 5 years (61.6%). Regarding behavior change strategies, the most dominant strategy seen was the identification (imitation) strategy at 52.6% and the least used strategy was the forced strategy at 1.9%.

Conclusion: The majority of pre-school children's dental health behavior was in the "fair" category (65.7%). The identification (imitation) strategy dominated at 52.6% as a method of behavior change in pre-school children across all age groups, while the compliance (compulsion) strategy was found at 1.9%.

Keywords: Behavior change strategies, dental health, pre-school children, identification strategy.

Introduction

Oral health in preschool children plays a crucial role in supporting optimal growth and development. Dental caries remains a major challenge in Indonesia, including in East Java Province, where data indicates that 54.3% of children aged ≥ 3 years experience dental health problems ^[1]. In Jember Regency, there are 94,439 cases of dental health issues. Behavioral factors play an important role in influencing oral health status, as evidenced by the increase in the correct tooth-brushing behavior among the Indonesian population. Data from the 2018 Riskesdas survey show an increase in the prevalence of proper tooth brushing from 2.8% in 2018 to 6.2% in 2023 ^[1]. Preschool children, aged 3 to 6 years, exhibit oral health behaviors that are strongly influenced by their parents and close family members ^[2].

Oral health in pre-school age children plays an important role in supporting optimal growth and development. The problem of dental caries is still a big challenge in Indonesia, including in East Java Province in children aged ≥ 3 years old data shows 54.3% of children experience dental health problems ^[1]. Dental health problems in Jember Regency amounted to 94,439 cases. Behavioral factors play an important role in influencing oral health status as evidenced by the correct tooth brushing behavior of the Indonesian population which has increased from 2.8% in Riskesdas 2018 to 6.2% ^[1].

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Pre-school children are children with an age range of 3-6 Years Old whose dental health behavior is influenced by the influence of parents and their closest relatives [2].

Based on the results of an initial survey conducted at the Jelbuk Health Center, the cause of dental health problems in Jelbuk District in pre-school children, especially rampant caries and Early Childhood Caries (ECC), is due to the low knowledge of parents, most of whom have a low level of education. UKGS activities in 14 kindergartens are not routinely carried out and only take place at least once a year. In addition, only 5% of the community are willing to visit the dentist because they feel embarrassed and consider it not a necessity.

According to the UKP Puskesmas Report by the Jember Health Office in 2020, Jelbuk District ranks third in Jember Regency with the highest caries prevalence [5]. Based on research conducted by Hafizhah *et al.*, dental health problems in children aged 2-5 years in Panduman Village, Jelbuk District, namely Early Childhood Caries (ECC) which reached (47.6%) in boys and (52.4%) in girls. This can be caused by the low knowledge and behavior of parents regarding oral health care so that they cannot improve oral health care behavior in children [6].

According to Chan *et al.*, changes in dental health behavior cannot occur spontaneously, especially in pre-school children, but rather require interventions that encourage positive behavior. Some behavior change strategies commonly used in previous studies include the transtheoretical model, theory of planned behavior, social cognitive theory, and health belief

model, but some of these strategies are less effective [7]. According to Irwan's theory, to improve the oral health of pre-school children, they can adopt the strategies of compulsion (Compliance), imitation (Identification) (Identification), and internalization (Internalization) [4].

Based on this description, this study aims to determine the description of strategies for changing dental health behavior in pre-school children in the community of Jelbuk District, Jember Regency.

Materials and Methods

This study was conducted in the work area of the Puskesmas and KB-TK (Playgroup and Kindergarten) of Jelbuk District, Jember Regency in July-October 2024. The methodology used in this study was descriptive observational with a cross-sectional approach. The population of this study involved 268 children aged 3-6 years selected through purposive sampling technique. Data were obtained through a questionnaire of pre-school children's dental health behavior and a questionnaire of pre-school children's behavior change strategies that adapted Dewi's questionnaire [9] and Hage *et al.* [10], then the filling was assisted by the respondent's parents and analyzed descriptively using SPSS software.

Results

This study was conducted from July to October 2024 with a sample size of 268 preschool children in Jember Regency from thirteen kindergartens/playgroups selected by purposive sampling.

Table 1: Frequency Distribution of Respondent Characteristic

Characteristic Respondent	Total (n)	Percentage (%)
Age		
3 Years Old	18	6,7
4 Years Old	60	22,4
5 Years Old	112	41,8
6 Years Old	78	29,1
Total	268	100
Gender		
Boy	143	53,4
Girl	125	46,6
Total	268	100
Parents Age		
15-25 Years Old	88	32,8
26-35 Years Old	140	52,2
36-45 Years Old	34	12,7
46-55 Years Old	6	2,2
Total	268	100
Parents Occupation		
Housewife	222	82,8
Laborer	19	7,1
Self Employed	11	4,1
Private Employee	16	6
Total	268	100

Based on table 1 above based on age shows that the data in this study can be concluded that of the 268 respondents, the majority of children's age is 5 years, while based on the gender of the 268 respondents it can be concluded that children with male gender are more than women. Data

obtained from the age of the parents can be concluded that out of 268 respondents, the majority of the respondents' parents' age is 26-35 years. In addition, the occupation of parents of pre-school children is dominated by housewives totaling 222 people.

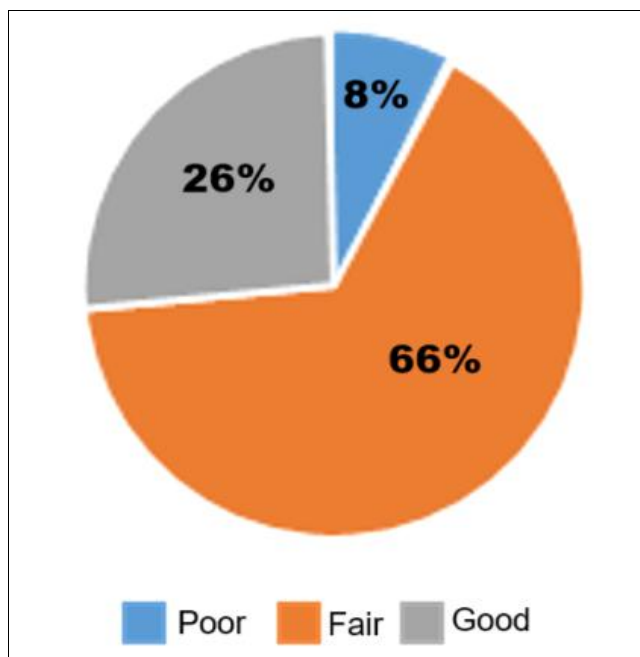


Fig 1: Diagram of Pre-school Children's Dental Health Behavior

The figure shows that there are 177 children (66%) with fair behavior, 60 children (22.4%) with poor behavior, and 31 children (11.6%) with good behavior.

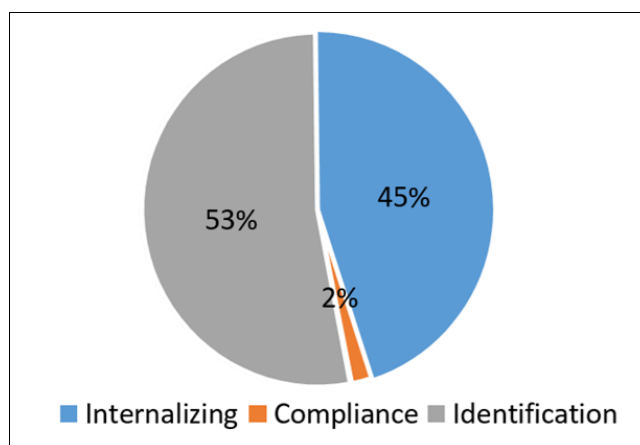


Fig 2: Diagram of Pre-school Children's Dental Health Behavior Change Strategy

The table shows that there are 141 children (52.6%) with imitation (Identification) strategies, 122 children (45.5%) with appreciation strategies, and 5 children (1.9%) with compulsion (Compliance) strategies. It can be concluded that the majority are children with imitation (Identification) strategies.

Table 3: Cross Tabulation of Pre-School Children's Dental Health Behavior by Age of Respondent's Parents

Age	Good		Fair		Poor		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
15-25 Years Old	23	26,1	60	68,1	5	5,68	88	100
26-35 Years Old	38	27,1	93	66,4	9	6,5	140	100
36-45 Years Old	9	26,4	19	55,8	6	17,6	34	100
45-55 Years Old	1	16,7	4	66,7	1	16,6	6	100

Based on the age of the respondents' parents, the category of fair dental health behavior dominated (66.4%) and the

category of poor dental health behavior (6.5%) was found in the age group in the age group 26-35 years.

Table 4: Cross Tabulation of Dental Health Behavior of Pre-School Children Based on Occupation of Respondent's Parents

Occupation	Good		Fair		Poor		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
Housewife	64	28,8	144	64,9	14	6,3	222	100
Laborer	1	5,3	15	78,9	3	15,8	19	100
Self Employed	4	36,4	6	54,6	1	9	11	100
Private Employee	2	12,5	11	68,8	3	18,7	16	100

The respondents' occupations had varying influences on children's behavior. Children with parents who work as housewives mostly have fair behavior, namely (64.9%) and good (28.8%). Children with parents who work as laborers show a slightly different pattern, with 15.8% of children in the poor category.

Table 5: Cross Tabulation of Pre-School Children's Dental Health Behavior by Respondent's Gender

Gender	Good		Fair		Poor		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
Boys	34	23,7	94	65,8	15	6,3	10,5	100
Girls	37	29,6	82	65,6	6	15,8	4,8	100

Based on the results of the Table analysis, in boys as many as 94 children and girls as many as 82 children, this shows that there is no difference between boys and girls, both tend to

have good enough behavior. The number of boys dominates because boys are more present at school than girls.

Table 6: Cross Tabulation of Pre-School Children's Dental Health Behavior by Age of Respondents

Age	Good		Fair		Poor		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
3 Years Old	2	11,1	16	88,9	0	0	18	100
4 Years Old	7	11,6	49	81,6	4	6,6	60	100
5 Years Old	33	29,4	69	61,6	10	8,9	112	100
6 Years Old	29	37,1	42	53,8	7	8,9	78	100

Meanwhile, based on the age of the child, fair behavior is most dominant in all age groups, especially in children aged 5 years, which reached 69 children (61.6%). Children aged 4 years showed a proportion of fair behavior as many as 49

children, while at the age of 3 years fair behavior dominated at 16 children (88.9%) compared to other categories. Overall, 6 year olds had a more balanced distribution of behavior between poor (37.1%), fair (53.8%), and good (8.9%).

Table 7: Cross Tabulation of Pre-School Children's Dental Health Behavior Change Strategies based on Age of Respondent's Parents

Age	Compulsion (Compliance)		Imitation (Identification)		Habitual (Internalizing)		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
15-25 Years Old	2	2,3	48	54,5	38	43,2	88	100
26-35 Years Old	3	2,1	73	52,1	64	45,7	140	100
36-45 Years Old	0	0	16	47,1	18	52,9	34	100
45-55 Years Old	0	0	4	66,7	2	33,3	6	100

Based on age groups, imitation (Identification) behavior change strategies were the most dominant among respondents aged 15-25 years (54.5%) and 26-35 years (52.1%), followed by imitation (Identification) behavior change strategies carried out by the 15-25 years age group & 26-35 years

(43.2%), 36-45 years (52.9%), and compulsion (Compliance) behavior change strategies that are almost not used (1.9%), namely in the 15-25 year age group (2.3%) & 26-35 years only (2.1%).

Table 8: Cross Tabulation of Pre-School Children's Dental Health Behavior Change Strategies based on the Occupations of Respondents' Parents

Occupation	Compulsion (Compliance)		Imitation (Identification)		Habitual (Internalizing)		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
Housewife	5	2,3	118	53,2	99	44,6	222	100
Laborer	0	0	12	63,2	7	38,3	19	100
Self Employed	0	0	3	27,3	8	72,7	11	100
Private Employee	0	0	8	50	8	50	16	100

The majority of children whose parents work as housewives adopt imitation (Identification) strategies (53.2%). Children of parents who are self-employed and private employees use

more internalizing strategies (72.7%) and (50%). Behavior change strategies in the compulsion (Compliance) category are only used by children whose parents work as housewives.

Table 9: Cross Tabulation of Pre-School Children's Dental Health Behavior Change Strategies based on Respondent Gender

Gender	Compulsion (Compliance)		Imitation (identification)		Habitual (Internalizing)		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
Laki-laki	3	2,1	82	57,3	58	40,6	143	100
Perempuan	2	1,6	59	47,2	64	51,2	125	100

The frequency distribution table for pre-school children shows that based on gender, there are 82 boys (57.3%) and 59 girls (40.6%) carried out imitation (Identification) behavior change strategies, while 64 girls using internalizing behavior change strategies. Apart from that, only 3 children (2.1%) categorized as compulsion (Compliance) behavior change strategies for men and only 2 children (1.6%) for women. In children aged 3 years, imitation (Identification) and

imitation (Identification) behavior change strategies were used equally, each by 50% (9 children), with no one using compulsion (Compliance) strategies. At the age of 4 years, the imitation (Identification) behavior change strategy was the most dominant with 60% (36 children), while only 1.7% (1 child) used a compulsion (Compliance) behavior change strategy. At the age of 5 years, the imitation (Identification) behavior change strategy still dominates with 50.9% (57

children) and only 1.8% (2 children) choosing the compulsion (Compliance) behavior change strategy. At the age of 6 years, imitation (Identification) behavior change strategies were

used by 50% (39 children), while compulsion (Compliance) behavior change strategies were slightly higher than at other ages, namely 2.6% (2 children).

Table 10: Cross Tabulation of Pre-School Children's Dental Health Behavior Change Strategies based on Respondent Age

Age	Compulsion (compliance) Total		Imitation (identification)		Habitual (Internalizing)		Total	
	Total (n)	%	Total (n)	%	Total (n)	%	Total (n)	%
3 Years Old	0	0	9	50	9	50	18	100
4 Years Old	1	1,7	36	60	23	38,3	60	100
5 Years Old	2	1,8	57	50,9	53	47,3	112	100
6 Years Old	2	2,6	39	50	37	47,4	78	100

Discussion

Based on the results obtained from the research in Table 1, the age distribution of respondents shows that children aged 5 years dominate the group. This is because children of this age are required to attend school, leading to a larger number of them. The gender distribution indicates that there are more male than female respondents, with 143 male children and 125 female children. This discrepancy is partly due to a greater number of male respondents attending the school compared to female respondents.

Data from the respondents' parents revealed that the majority of parents were aged 26-35 years. This age range generally represents the productive age group, where individuals tend to be married and have preschool-aged children or toddlers. This aligns with data from BPS, which indicates that the typical marriage age in Jelbuk District is between 21 and 30 years [3]. Additionally, the majority of parents of preschool children are housewives, as children in this area are usually cared for by their mothers rather than fathers. Fathers are typically seen as the primary earners, while mothers are responsible for household duties. This is consistent with the view of Borsa and Nunes in Nubia *et al.*, which states that childcare remains predominantly the responsibility of women [10].

Based on Figure 1, it can be concluded that the majority of respondents exhibited fairly good behavior. According to the researchers, this suggests that parents have a solid understanding of maintaining dental health. This study indicates that children's dental health behavior is greatly influenced by the knowledge, attitudes, and behaviors of their parents. The formation of attitudes and behaviors in preschool children is particularly shaped by the immediate environment, especially the family [11].

Figure 2 shows that the majority of respondents adopted behavior change strategies through imitation. Imitation is common among preschool children, as they view their parents as role models. At this age, children are still unable to maintain their own dental health independently. This is in line with research by Nubia *et al.*, which states that young children tend to imitate the behavior of their parents. In this phase of primary socialization, children spend most of their time with their mothers, who play a direct role in shaping children's health behaviors [10].

Table 2 reveals that the parents' age group of 26-35 years is associated with fairly good dental health behavior in the respondents. Parents in this age range are generally more concerned about dental health, and they are more adept at accessing information through electronic devices and social media. This is consistent with the view of Salsabila *et al.*, who argue that age can influence knowledge. As people grow older, their thinking and actions become more mature (20). The knowledge, attitudes, and positive actions of parents toward good dental care and preventive practices play a significant role in shaping children's behavior. This process

begins with parents receiving new knowledge from external stimuli [13].

Table 3 shows that children of parents who are housewives tend to exhibit fair behavior compared to children of parents in other occupational groups. This may be because housewives spend more time with their children, allowing them to supervise and pay closer attention to their children's dental hygiene. In contrast, children cared for by grandmothers or nannies may have less supervision, resulting in poorer dental health behavior. This finding is supported by Khairinisa *et al.*, who argue that mothers, particularly in their role as caregivers, play a crucial role in encouraging children to maintain good dental health [12]. Jobs that require more time, such as those of private employees, laborers, and entrepreneurs, can impact the development of children's behavior. This is due to a lack of time for supervision and limited quality interaction between children and their mothers [14].

Table 4 shows that both boys and girls tend to exhibit fairly good behavior. This could be because children's behavior is influenced by their parents' actions, the surrounding environment, and the support they receive from their parents. Mueller *et al.* suggest that parents today are motivated to maintain their children's dental health because they want them to have good dental appearance and health, which is influenced by social norms or personal drives to care for dental health [15]. The higher number of boys in this study corresponds with data from the 2023/2024 Dapodik, which shows 290 male students and 274 female students in KB-TK in Jelbuk District [23].

Table 5 shows that children aged 5 years exhibited the most dominant behavior in the "fairly good" category. According to the research, 5-year-old children exhibit this behavior because they are at an age where they enjoy playing but still require guidance and supervision from their parents. Additionally, while most parents know how to maintain their children's dental health, they tend to lack consistency in implementing it. This aligns with research by Salama *et al.*, which indicates that children often have fairly good behavior due to their mothers' unsatisfactory behavior, where the mother's attitude directly influences the child's actions [16]. Furthermore, children under 7 years old still need supervision while brushing their teeth because they tend to become distracted during this task [17].

Based on Table 6, behavior change strategies through imitation dominate across all age groups of respondents, with only a few using forced behavior change strategies. Interviews with parents indicated that children are more likely to brush their teeth if accompanied by their parents or when they are shown the correct behavior by their parents. According to Irwan, imitation is the most common behavior change strategy among preschool children, as they tend to replicate what they see without fully understanding it [14].

Table 7 shows that the majority of parents who are housewives use imitation behavior change strategies, while forced strategies are the least commonly used. This suggests that parents' occupations influence the behavior change strategies they adopt. Housewives, who spend more time with their children, are able to supervise, model, and reinforce desired behaviors, such as tooth brushing. This is in line with Aksit's research, which indicates that housewives' responsibilities in food preparation also provide opportunities to educate children about healthy daily living habits ^[17].

Table 8 shows that both boys and girls predominantly use imitative behavior change strategies. This aligns with the data showing that the number of boys is greater than the number of girls due to a higher attendance rate of boys in the research study. According to BPS data, there are 1,131 boys aged 4-9 years in Jelbuk District compared to 1,022 girls ^[3].

Table 9 indicates that imitation behavior change strategies are prevalent across all age groups of preschool children, particularly among 5-year-olds. Forced behavior change strategies were rarely used, especially among children aged 5 and 6. Five-year-old children are at a developmental stage where they are highly influenced by role models and need support from family and relatives to become more independent in the future. Kaushik & Sood state that children's dental health habits are shaped from infancy and maintained throughout early childhood ^[18]. Children in this "Golden Age" are highly sensitive to stimuli and tend to imitate the behaviors of adults, whether positive or negative ^[19].

Encouragement is the second most frequently used behavior change strategy, especially for 5-year-old children. Children who adopt this strategy are often supported by their parents, who model good behaviors and provide encouragement, fostering motivation to maintain healthy teeth. As children grow older, their cognitive and socio-emotional skills improve, allowing them to better control themselves, become more responsible, and understand the importance of dental health ^[21].

There were almost no children who adopted forced behavior change strategies. This may be due to parents' tendencies to spoil their children or difficulty managing their children's resistance when reminded to brush their teeth. Other factors such as a lack of knowledge and understanding about the importance of maintaining primary teeth, financial difficulties in providing toothbrushes and toothpaste, and challenges in establishing a consistent tooth-brushing routine also play a role, alongside the influence of family dynamics ^[20].

Conclusion

The results of the study regarding the description of strategies for changing the dental health behavior of pre-school children can be concluded as follows:

1. The majority of pre-school children's dental health behavior is in the good enough category (66%).
2. The identification strategy (imitation (Identification) dominates at 52.6% as a method of behavior change in preschool children.
3. The living strategy at 45.5% was the second choice, especially at a more mature age.
4. The compulsion (Compliance) strategy was encountered at 1.9% due to the behavior of parents who tend to spoil and ignore children.

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Author's Contribution

Not available

Conflict of Interest

Not available

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