







Determinants of Oral Health Behavior in Preschoolers: Application of the Theory of Health Belief Model

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Abstract: Oral and dental health behavior greatly influences the occurrence of dental disease, where children aged five years have the highest incidence of dental disease, which is 93%. Regarding the use of healthy behavior factors, people are still not aware that oral and dental health behavior is only 2.8% in the five-year age group. This study aims to determine the predictive factors of oral health behavior in pre-school children based on the theory of health belief model, Theory of Planned Behavior and Social Cognitive Theory. The cross-sectional study method involved 200 mothers and children in the city of Jambi with a sampling technique using purposive sampling. The results showed that the mean standard deviation of the children's age was 5.6 ± 1.1 years (range 5-6), and 52% were girls. The mean (SD) score for oral health behavior was 4, 8 (± 1.9) out of 10. Regression analysis showed a positive relationship between all HBM, TPB and SCT structures on oral health behavior. Conclude that Health Belief Model was an important predictor of children's oral health behavior ($p < 0.001$). Effective promotional interventions can be designed based on these predictors to help improve children's oral hygiene behavior.


1 INTRODUCTION


Dental and oral health is one of the basic components of pre-school children's health. Young children are completely dependent on their parents, especially their mothers, to have proper oral health (Baghiani, 2015). The proportion of tooth brushing behavior based on the age group of 5-9 years brushing their teeth every day is 93.2%, but the correct brushing time is only 1.4%. While in Jambi Province, it was found that 96.4% brushed their teeth every day, only 1% of them brushed their teeth according to the recommendation. Nationally, tooth brushing behavior in Jambi province is the lowest in Indonesia (Kemenkes RI, 2018).


Regarding the use of healthy behavior factors, people are still not aware that oral and dental health


behavior is only 2.8% in the five-year age group. Oral and dental health behavior greatly influences the occurrence of dental disease, where children aged five years have the highest incidence of dental disease, which is 93%. Therefore, it is highly recommended to improve oral and dental health behavior as an effort to prevent dental and oral diseases in children (Publishery, 2013). Behaviors related to oral health include eating habits, oral hygiene habits, dental care (Branden, et al., 2014).


Several research results on oral behavior in pre-school children, a significant predictor of individual behavior today is attitude. The theory of planned behavior (TPB) and the health action process approach (HAPA) were the best predictors of intention to engage in both behaviors (Dumitrescu Al, et al. 2014). The Health Belief Model shows the relationship between several structures related to


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personal perceptions, perceived barriers and self-efficiency, and behavior (Baghiani, 2015). The theory of Planned Behavior is also proven to be an important predictor of children's oral health behavior. These findings are useful in the formation to promote dental and oral health behaviors of children. An effective dental and oral health education intervention can be designed based on this predictor (TPB component) to increase the mother's perspective on oral health and dental and oral health behavior of her child. Health professionals in health care settings can provide mothers with accurate practical information and training on oral self-care behaviors. However, further research is needed to confirm the results of this study (Soltani, 2018).

Research by Makuch et al (2011) stated that the use of games, exercises, performances/theatre and puppets aimed at children's development is more than just presenting didactic information. From the model given above, it can be stated that the development of oral health skills is carried out using an exclusive approach and a program that aims to improve the oral health abilities of pre-school children. An unsupportive approach was taken by Garbin, et al (2009), where pre-school children were involved in programs using role-play programs, painting using numbers, audiovisual, music, and playing programs. As a result, pre-schoolers can pass on the knowledge gained at school to their parents who change their family members' dental health routines.

In addition to the approach mentioned above, changes in oral health behavior are mostly carried out through the application of program models as researched by Yevlahova, et al (2009) that the transtheoretical model, has been found to be the most effective approach to updating health behavior.

From a preliminary study of pre-school-aged children in Jambi City, it was shown that the oral health behavior of pre-school children in TK/PAUD was not optimal, ie 2.2 criteria were lacking. The oral health behavior of pre-school children in Jambi City still needs to be improved. These data are supported by facts found when interviewing pre-school children, kindergarten teachers and parents, such as: (1) Pre-school children's oral health behavior is not optimal, (2) Unable to maintain oral health at home, (3) Does not know the function and shape of teeth, (4) likes to eat foods that can damage teeth, (5) only gets oral health information from television, and (6) tends to receive oral health information obtained by the teacher without being followed by understanding the material obtained so that it is less able to maintain oral health.

Based on the analysis presented above, the problems faced are the low oral health behavior of pre-school children and understanding of oral health materials. So the authors feel it is necessary to know the determinants of oral health behavior in pre-school children in developing an intervention model for changing oral and dental health behavior for pre-school children according to the characteristics of the intervention material.

2 MATERIALS AND METHODS

Cross-sectional study This study was conducted on 200 mothers and children with children aged 4-6 years in Kindergarten in Jambi City, Indonesia with the sampling technique in this study is non-probability sampling, which in this study was chosen purposive sampling, the reason for choosing this sampling technique is considering the sample of this study, namely parents of kindergarten children who are willing to have specific information on children's oral health behavior. Inclusion criteria were willingness to participate in the study, mothers with children aged 4-6 years actively enrolled in Kindergarten school year 2020/2021, and not suffering from any physical or mental illness.

Data were collected through a questionnaire that was filled out by the mother herself. They were informed of the purpose of the study and subsequently, they signed a written informed consent. Filling out the questionnaire takes approximately 25 minutes. The participants were awarded several prizes (such as toothpaste and toothbrush) for their voluntary participation in the study.

2.1 Measurement

The implementation of data collection techniques is adjusted to the Covid-19 health protocol, carried out through the google form. The link (link) of the questionnaire will be distributed to all parents of kindergarten children via WhatsApp. The questionnaire consisted of three parts: demographic characteristics, children's oral health behaviors, and the construction of HBM (perceived benefits, barriers to action, and self-efficacy). However, because the Covid-19 pandemic is still collecting data on the perceived severity component, the signal for action cannot be taken. Demographic characteristics include age of mother and child, gender of child, age of mother's occupation and education (illiteracy, elementary, junior high, high school, diploma, and

academic) and economic status (weak, moderate, good).

2.2 Children's Dental and Oral Health Behavior

Children's oral health behavior was evaluated through 10 questions about oral health. Scores may range from 0–10, with higher scores indicating better oral health behaviors.

2.3 TPB Arrange Items

The HBM construct related to children's oral health behavior was assessed through 18 items derived from the available literature in accordance with HBM procedures and guidelines. The HBM-based questions address perceived vulnerabilities, perceived benefits, perceived barriers and self-efficacy. Responses to all items were scored on a 5-point scale ranging from 1 (strongly disagree) to 5 (strongly agree).

dapatkah Anda menjelaskan berapa banyak item sebelum dan sesudah uji validitas dan reliabilitas?

2.4 Reliability and Validity

When tested for the validity of the contents of all the questionnaires confirmed to be valid. The mean was 0.81 ($p > 0.6$) and the total reliability (Cronbach's alpha) was 0.89, indicating good internal consistency.

Tes statistik seperti apa?

Statistic analysis

All data were analyzed using SPSS version 16 software. The analysis was carried out using univariate and bivariate analysis (linear regression) with a level of < 0.05 .

3 RESULTS AND DISCUSSION

Table 1 displays the demographic characteristics of the participants. The mean \pm SD children's age was 5.24 ± 0.61 years; and 52% were women. The mean age \pm SD of the mother was 31.25 ± 1.27 . About 28% of mothers have a bachelor's degree; 92 mothers (46%) worked; and 66% good economic status and 24% mother's knowledge about oral health is good. Then the average oral health behavior is 4.23, susceptibility is 2.24, benefit is 2.27, barrier is 2.28 and efficacy is 2.29.

Table 1: Distribution of socio-demographic characteristics, oral health behaviors and the construct of HBM (n = 200)

Variable	Total (N)	(%)
Child Gender		
- Man	96	48
- girl	104	52
Mother's Education		
- high school	96	48
- Diploma	76	38
- University	28	14
Mother's Employment Status		
- Work	92	46
- Unemployment	108	54
Economic Status		
- Weak	68	34
- Good	132	66
Mother's Knowledge		
- Not good	152	76
- Good	48	24
Variable	Average	SD
Mother's Age (years)	31.25	1.27
Child's Age (years)	5.24	0.61
Oral health behavior	4.23	0.86
Vulnerability	2.24	0.73
Benefits	2.27	0.69
Resistance	2.28	0.68
Self efficacy	2.29	0.66

Table 2 of the relationship between perceived vulnerability, benefits, barriers and self-efficacy shows a positive correlation with low strength/closeness of the relationship on perceived vulnerability ($r = 0.236$), perceived benefits ($r = 0.458$), perceived barriers ($r = 0.351$) and self-efficacy ($r = 0.499$). This means that the higher the vulnerability, benefits, barriers and self-efficacy, the higher the child's oral health behavior. However, the perceived susceptibility variable can only explain 5.6%, and 5.5% (perceived benefits and barriers), and 4.4% (self-efficacy) variations in children's oral health behavior variables. Although this relationship was statistically significant ($p < 0.05$). All components of the HBM are the main predictors of oral health behavior in pre-school children.

Table 2. Analysis of Correlation and Linear Regression Oral health behavior and components of HBM

Variable	R	R2	Line Equation (Oral Health Behavior)	p-value
Vulnerability	0.236	0.056	3.599 + 0.279	0.001
Benefits	0.235	0.055	3.562 + 0.292	0.001
Resistance	0.235	0.055	3.548 + 0.297	0.001
Self efficacy	0.209	0.044	3.603 + 0.271	0.003

4 CONCLUSIONS

Health Belief Model proven to be an important predictor of oral health behavior in pre-school children. These findings are useful in designing a conceptual framework for promoting oral health behaviors in pre-school children. Effective oral health promotion interventions can be designed based on this predictor (HBM component) to improve oral health behaviors in pre-school children. However, further research is needed to confirm these results especially in the development of a health promotion model to improve oral health behavior in pre-school children.

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REFERENCES

Baghiani Moghadam MH, Mozaffarian Azad M, Biria M, Sabour S. Evaluation of oral hygiene care of less than 4 years old children by their mothers based on the Health Belief Model. *J Dent Sch.* 2015; 33:9-18.

Dumitrescu AL, Dogaru BC, Duta C, Manolescu BN. Testing five social-cognitive models to explain predictors of personal oral health behaviors and intention to improve them. *Oral Prev Dent.* 2014;12(4)345-355.

Garbin C, Garbin A, Santos K, Lima D. Oral health education in schools: promoting health agents. *int. J Dent Hyang* 2009;7:212-6.

Makuch A, Rescke K, Rupf S. (2011). Effective Teaching of Tooth Brushing to Pre-schoolchildren. *J Dent Child (Chic)*, 2011. 78(1):9-12.

Ministry of Health of the Republic of Indonesia. 2018. Basic Health Research (RISKESDAS) 2018. The Indonesian Ministry of Health Research and Development Agency for 2018.

Pullishery F, Panchmal GS, Shenoy. (2013). Parental attitudes and tooth brushing habits in pre-school children in Mangalore, Karnataka: A cross-sectional study. *International Journal of Clinical Pediatric Dentistry*, 6(3), 156-160.

Rusdi, 2018. Research on Educational Design and Development. New Knowledge Concepts, Procedures and Synthesis. 1st printing, July 2018. Publisher PT. RajagrafindoPersada. Rajawali Press: Depok.

Rusdi, 2020. Research on Educational Treatment. 1st printing, August 2020. Publisher PT. RajagrafindoPersada. Rajawali Press: Depok.

Soltani R., Sharifirad G., Mahaki B., Eslami AA., Determinants of Oral Health Behavior among Pre-school Children: Application of the Theory of Planned Behavior. *J Dent (Shiraz)*. 2018 Dec; 19(4): 273-279.

Souza IPMA, Jacobina RR. Educação em saúde e suas versões na história brasileira. *Rev Baiana Saúde Pública* 2009;33:618-27.

Tolvanen M, Lahti S, Poutanen R, Sepp L, Pohjola V, Hausen H. Changes in children's oral health-related behavior, knowledge and attitudes during a 3.4-yr randomized clinical trial and oral health-promotion program. *Eur J Oral Sci* 2009;117:390-7.

Van den Branden S, Van den Broucke S, Leroy R, Declerck D, Hoppenbrouwers K. Predicting oral health-related behavior in the parents of pre-school children: Application of the Theory of Planned Behavior. *Health Educational Journal.* 2014; 74: 221-230.

Yevlahova D., Satur J., 2009. Models for individual oral health promotion and their effectiveness: a systematic review.