

DOI: 10.30644/rik.v13i2.889

Development of a dental caries monitoring card to prevent stunting in children elementary school

Slamet Riyadi¹, Yesi Nurmawi^{1*}, Sri Febrianti¹, Teuku Salfiyadi², Linda Suryani²

¹ Department of Dental Health, Health Polytechnic, Ministry of Health, Jambi

² Department of Dental Health, Health Polytechnic, Ministry of Health, Aceh

*Corresponding author's email: yesinurmawi@poltekkesjambi.ac.id

Accepted: 01 September 2024; revision: 10 October 2024; published: 31 December 2024

Abstract

Background: The Stunting Prevention Dental Caries Monitoring Card is designed to improve parenting practices to prevent stunting in children. The child-themed cards are portable and user-friendly for both children and health practitioners. This approach aims to prevent dental caries, which can affect food intake and nutritional status.

Method: This research uses the Research and Development (R&D) method and was conducted at SDN 77/IV Jambi City. Subjects included evaluations from material and media experts, as well as group trials with 16 elementary school children. Data collection involved expert assessments and questionnaires completed by the children.

Results: The Dental Caries Monitoring Card is designed to prevent dental caries and serves as a model for parenting strategies to combat stunting in elementary school children. Evaluations from media and material expert validators indicated that the card is highly appropriate for dental health promotion, scoring 89.0% for media and 87.9% for material. Additionally, school-aged children responded positively to the card, with a score of 88.3%.

Conclusion: The development of this monitoring card provides a practical tool for children, parents, and health practitioners, fostering improved parenting practices. It aims to prevent dental caries, which can, in turn, positively impact children's food intake and nutritional status.

Keywords: monitoring card; dental caries; Stunting.

INTRODUCTION

The formation of a healthy and perfect tooth structure is supported by adequate nutrition, especially protein, calcium, phosphate, and vitamin C, as well as vitamin D. The nutritional status of the community is described by the nutritional status of children under five, school children, pregnant women and other nutritionally vulnerable groups. one of the indicators that can be used to assess the quality of human resources. The quality of Human Resources (HR) is one of the main factors needed in implementing national development (1).

Stunting in children is one form of malnutrition. Indonesia ranks first in the prevalence of stunting in the Southeast Asia region, with a rate of 36.4%. As of 2023, the national prevalence of stunting among

children aged 5-12 years is 18.7%, while in Jambi Province it is 20.5%. Stunting has become a public health issue in nearly all developing countries and is a global problem faced by many countries around the world (2-4).

Besides the issue of stunting that can affect a child's development, dental caries is one of the oral health disorders that are particularly vulnerable in children. The 2023 Indonesia Health Survey indicates that the primary oral health problem in Indonesia is tooth loss due to caries, which has shown a tendency to increase, with the rate in 2023 being 56.9% compared to 25.9% in 2013 and 23.4% in 2007. In Jambi Province, the oral health issue is at 50.9%. The prevalence of caries among the 5-9 year age group is 49.9% (4).

Dental caries is a common dental health issue that children are susceptible to. Maintaining dental health is crucial, particularly for a child's development. Dental caries can lead to a reduction in chewing ability (impaired chewing function), impact appetite, affect nutritional intake, and disrupt digestion, all of which result in suboptimal growth and ultimately influence the child's nutritional status (5,6).

At the age range of 6 to 12 years, milk teeth begin to be replaced by permanent teeth. Permanent teeth appear at the age of 12 years, except for the second and third molars. Certain food choices have an influence at this age, a very important health problem at this age is caries and tooth irregularity. At this level of development, the role of parents is needed so that caries does not occur in permanent teeth. School age children are an age that is vulnerable to caries, the role of parents in caring for, educating, encouraging and supervising children in maintaining dental hygiene is important in preventing caries (7).

Two alternative mechanisms in the relationship between dental caries and growth retardation. The first mechanism is that dental caries and the associated pain in primary teeth affect the child's ability to chew, which ultimately leads to malnutrition and growth disturbances. The second mechanism is the impact of chronic dental infections (dental caries) on the body's systemic response, such as systemic inflammation, immune changes, and hormonal alterations, which can result in growth failure. The body's systemic response can be indicated by the number of white blood cells (WBC) (8). Untreated deep dental caries typically leads to chronic inflammation and oral pain. In turn, chronic inflammation and oral pain can cause eating and sleeping disturbances, as well as exacerbate the adverse effects of other risk factors on a child's nutritional status (9).

A well-chosen and appropriate visual medium can be as impactful as thousands of words. It has the potential to capture emotional attention more effectively and can make the message more engaging, reducing

boredom. As a result, it can enhance the learning process, making it easier, more interesting, and enjoyable (10). The Dental Caries Monitoring Card is expected to influence the interest and curiosity of elementary school children in preventing dental caries.

METHOD

This research uses the Research and Development (R&D) method. This research was carried out at 77/IV Jambi City. The test subjects in the research were expert test subjects (material experts and media experts). Group trials were carried out on 16 elementary school children at SDN 77/IV Jambi City. Data collection techniques include expert assessments and responses from elementary school children, using questionnaire instruments. The trials were conducted to gather the necessary data as a reference for assessing the suitability and quality of the dental caries monitoring card being developed. The trials carried out included expert validation tests and group trials primary school children.

Data obtained through product assessment sheets are analyzed quantitatively and qualitatively. Qualitative data was obtained from: 1) comments and suggestions obtained from material experts and media experts; 2) comments and suggestions from teachers 3) comments and suggestions from elementary school children. The data obtained was analyzed and described qualitatively to revise the product being developed. Quantitative data in this research and development is in the form of: 1) assessment scores from expert validation; 2) scores from product trials; 3) scores from usage trials. The questionnaire data from elementary school children's responses were evaluated using the Guttman scale. Therefore, if the expert assessments, product trials, and usage trials yield results of at least "Good", the developed dental caries monitoring card product can be considered appropriate for use.

RESULT

1. PRODUCT DEVELOPMENT OF A DENTAL CARIES MONITORING CARD TO PREVENT STUNTING IN SCHOOL CHILDREN

Producing a product that can be used by children, parents, and health practitioners as a medium for developing parenting patterns in the form of a dental caries monitoring card is expected to help prevent caries that can affect food intake and nutritional status. The dental caries monitoring card can be seen in Figure 1.



Figure 1 Dental Caries Monitoring Card for Stunting Prevention in Elementary School Children

Parenting practices, particularly in feeding, are one of the key efforts to reduce stunting, focusing on families and communities through various programs and activities (11). To increase family knowledge about nutrition, interesting and informative educational media is needed, so that delivering educational messages accompanied by message material or tools is expected to make it easier to remember the messages given. Information media can stimulate targets to carry out messages and help enforce knowledge that has been received so that it will remain stored in memory longer.

This stunting prevention dental caries monitoring card is a development model for parenting patterns to prevent stunting in children. These cards were developed with a school child theme and are efficient for children and health practitioners to carry and play with. The parenting pattern in the form of a Dental Caries Monitoring Card is expected to prevent caries which can affect food intake and nutritional status.

Based on the results of problem identification and data collection through

literature studies, media was obtained which is expected to help parents in parenting patterns to prevent stunting in children. The findings were used to design and develop a product in the form of printed media, namely a dental caries monitoring card to prevent stunting in school children.

Producing a product that can be used by children, parents and health practitioners as a medium for developing parenting patterns in the form of dental caries monitoring cards is expected to prevent caries which can affect food intake and nutritional status.

2. ELIGIBILITY OF THE DENTAL CARIES MONITORING CARD IS BASED ON MEDIA AND MATERIAL EXPERT VALIDATION

The feasibility of the Dental Caries Monitoring Card was based on the assessment of media and material experts based on validation from each of the three experts and the card underwent one revision.

a. The assessment or validation carried out by experts on the Dental Caries Monitoring Card media was carried out twice.

In the initial validation, the average total score from the three validators was 55.0 out of a maximum of 70, with a total percentage of 79%. The media was deemed appropriate with revisions. Validators provided suggestions for improving media quality. Following these suggestions, the researcher made revisions, resulting in an increased average total score for the material assessment of 62.3 (out of 70), with a total percentage of 89.0%. The media was then considered highly feasible without further revision. The material expert validators concluded that the Dental Caries Monitoring Card was highly suitable for promoting dental health as part of a parenting strategy to prevent stunting in elementary school children.

b. Expert assessment or validation of the Dental Caries Monitoring Card material was carried out twice.

In the first validation, the average total score from the 3 validators was 63.3 out of a maximum score of 80, with a percentage of the total score of 79.2%. The media eligibility criteria were appropriate with revision. The validator provides suggestions for improvements to the basic concept of the material. Based on these suggestions, the researchers made revisions, resulting in an average total score for the material assessment of 70.3 out of a maximum of 80, with a total percentage of 87.9%. The media was deemed highly feasible without further revision. The material expert validator's assessment concluded that the Dental Caries Monitoring Card was highly suitable for use in promoting dental health as part of a parenting strategy to prevent stunting in elementary school children.

3. FEASIBILITY OF DENTAL CARIES MONITORING CARDS BASED ON PRIMARY SCHOOL CHILDREN'S RESPONSES

Respondents consisted of 16 elementary school children. This Dental Caries Monitoring Card was tested to obtain responses in the form of interest, material and language from elementary school children. These responses can be seen in table 1.

Table 1. Response of Elementary School Children to the Dental Caries Monitoring Card

Indicator	Average Child Response Score
Interest	13,3
Material	9,0
Language	13,0
Total	35,3
%	88,3
Eligibility Criteria	Very feasible

Based on Table 1, the average score for assessing the results of media trials or responses from elementary school children is 35.3 out of a maximum score of 40, with a total percentage of

88.3%. The media is considered highly feasible according to the eligibility criteria.

DISCUSSION

The Dental Caries Monitoring Card is a development model for parenting patterns to prevent stunting in toddlers. These cards were developed with the theme of school-aged children and are efficient for children and health practitioners to carry and study. The parenting pattern in the form of a Dental Caries Monitoring Card is expected to prevent caries which can affect food intake and nutritional status.

Dental caries is a common dental health issue that children are susceptible to. Maintaining dental health is crucial, especially for a child's development. Dental caries can lead to a reduction in chewing ability (impaired chewing function), impact appetite, affect nutritional intake, and disrupt digestion, resulting in suboptimal growth, which ultimately affects the child's nutritional status (5,6). Promotive and preventive measures are essential to address dental and oral health issues, one of which is through the School Dental Health Program (UKGS) (12).

Dental Caries Monitoring Cards are highly appropriate and well-suited for elementary school children, as using cards during play aligns with their growth and development patterns. At this age, children are naturally curious and eager to explore objects and their surroundings. Through play, elementary school children can learn about dental caries and its prevention from the cards in a comfortable and engaging environment.

The Dental Caries Monitoring Card has benefits and uses, including: 1) Elementary school children learn to grasp the concept of dental caries and how to prevent it, 2) Enhance social skills and abilities as the game is played by 2-3 children, 3) Children develop their cognitive skills by creating strategies to win the game. Additionally, they learn sportsmanship at an early age, understanding that in any game, there are both winners and losers, 4) Enhance understanding and knowledge of the health

messages conveyed on the cards and 5) These cards can be utilized as a parenting tool for elementary school children, together with their parents and health practitioners, to help prevent caries, which can impact food intake and nutritional status.

CONCLUSIONS

The Dental Caries Monitoring Card is to prevent dental caries and is a development model for parenting patterns to prevent stunting in elementary school children.

Based on the assessment of media and material expert validators, the Dental Caries Monitoring Card media is very suitable for use for dental health promotion as a parenting pattern to prevent stunting in toddlers, with a score of 89.0% for media and 87.9% for material.

The response of school age children to the Dental Caries Monitoring Card media was very adequate with a score percentage of 88.3%

REFERENCES

1. Soetjningsih, Ranuh IGNG. *Tumbuh Kembang Anak Edisi 2*. 2nd ed. EGC; 2014.
2. Gibney MJ, Margetts BM, Kearney JM, Arab L. *Gizi Kesehatan Masyarakat*. Gibney MJ, Margetts BM, Kearney JM, Arab L, editors. Jakarta: EGC; 2013.
3. World Bank. *Child Malnutrition Estimates*. 2016.
4. BKKP Kemenkes. *Survei Kesehatan Indonesia (SKI) 2023 dalam Angka*. 2024.
5. Sinaga A. Faktor-faktor yang Berhubungan dengan perilaku Ibu dalam Mencegah Karies Gigi Anak Usia 1–5 Tahun di Puskesmas Babakan Sari Bandung. *Jurnal Darma Agung*. 2013;21(13).
6. Rohmawati N. Karies Gigi dan Status Gizi Anak (Dental Caries and Nutritional Status of Children: An evidence-based review). *Jurnal Kedokteran Gigi*. 2016;13(1).
7. Eddy FNE, Mutiara H. Peranan Ibu dalam Pemeliharaan Kesehatan Gigi Anak dengan Status Karies Anak Usia Sekolah Dasar. *Majority*. 2015;4(8):1–6.
8. Alkarimi HA, Watt RG, Pikhart H, Sheiham A. Dental Caries and Growth in School-Age Children. *Pediatrics*. 2014 Feb;133(3).
9. Ngoh Khanh L, Ivey SL, Barkan H, Ngo KM, Hoang HT, Vuong I, et al. Vietnam tooth project: Relationship between childhood caries and weight status in Vietnam. *Am J Public Health [Internet]*. 2015 Oct 15; Available from: <https://www.researchgate.net/publication/266786892>
10. Soebroto T, Priatmoko S, Jurusan NS. PENGARUH MEDIA VISUAL DI RUANG KELAS TERHADAP MINAT DAN HASIL BELAJAR KIMIA SISWA. Vol. 3, *Jurnal Inovasi Pendidikan Kimia*. 2009.
11. Bappenas. *Pedoman Pelaksanaan Intervensi Penurunan Stunting Terintegrasi Di Kabupaten Kota*. 2018.
12. Asriawal, Jumriani. Hubungan Tingkat Karies Gigi Anak Pra Sekolah terhadap Stunting di Taman Kanak-Kanak Oriza Sativa Kecamatan Lau Kabupaten Maros. *Media Kesehatan Gigi*. 2020;19(1).