Development of a monitoring book for maternal dental health to prevent the risk of stunting

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Abstract

Background: Stunting has serious impacts, including impaired brain development leading to reduced intelligence, increased risk of disease, and higher risk of mortality. Stunting can occur during pregnancy due to inadequate nutritional intake, improper dietary patterns, and low-quality food, all of which hinder a child's growth. Efforts to prevent stunting have been implemented since pregnancy, especially during the first 1,000 days of life (HPK). Many books are used in research to improve maternal and child health and prevent stunting, one of which is the KIA book and pocket book. However, the KIA book still has shortcomings in the dental health aspect. The book does not explain how to care for healthy teeth during pregnancy and the benefits for the child's health. The pocket book only focuses on preventing stunting in children without dental health qualifications for pregnant women. Based on a literature survey, there are no books that combine maternal and child health, dental health, and stunting prevention. Therefore, research is needed to develop a dental health guidebook for pregnant women to prevent the risk of stunting and become a companion information source for the KIA book.
Method: This research uses the Research and Development (R&D) method according to Borg and Gall (2003) with the following stages: 1) Identifying potential problems, 2) Data collection, 3) Product design planning, 4) Product creation, 5) Development: Internal testing. Internal testing involves expert validation to assess the feasibility of the product before it is used by the public, as well as user validation to ensure it is suitable for effectiveness testing in further research.
Results: This study shows that the "Monitoring Book for Maternal Dental Health to Prevent the Risk of Stunting" has a very high feasibility level based on expert validation (96%) and respondent validation (86%).
Conclusion: The book is considered effective and easy to understand by users. It is highly needed among the community and healthcare workers to raise awareness among pregnant women about the importance of maintaining oral and dental health to prevent the risk of stunting. The book is also considered practical for use as educational material at home.

Keywords: monitoring book; pregnant; stunting.

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INTRODUCTION

One of the stunting prevention programs is the family-based approach, such as conducting routine ANC (Antenatal Care) visits (K1-K4) implemented by community health centers (puskesmas). Since stunting can be prevented starting from pregnancy, ANC visits are crucial for detecting and preventing risk factors associated with stunting by providing services related to maternal health status, immunization, nutrition, and breastfeeding counseling. (1) Preventing stunting is vital given that the stunting rate in Indonesia remains relatively high. According to data from the Ministry of Health, the prevalence of stunting among children under five in Indonesia is still above 27%. Addressing the stunting issue requires a multidimensional approach, including improving maternal health conditions during

pregnancy through a monitoring book on dental and oral health for pregnant women to prevent the risk of stunting. The monitoring book resulting from this research will serve as an easily understandable and applicable source of information, helping pregnant women to maintain their dental and oral health and reduce the risk of stunting in their children. Many books have been used in research to improve maternal and child health and prevent stunting, including the KIA book and pocket books. (2)(3)(4)(5) However, the KIA book still has limitations in the aspect of dental health. It does not explain how to care for dental health during pregnancy and its benefits for child health. Pocket books focus solely on stunting prevention in children without linking it to the dental health of pregnant women. According to literature surveys, there is no book that combines maternal and child health, dental health, and stunting prevention. Therefore, research is needed to develop a guidebook on maternal dental health to prevent the risk of stunting and serve as a supplementary information source to the KIA book.

METHOD

In this study, the researcher used the Research and Development (R&D) steps according to Borg and Gall (2003) with the following stages: 1) Identifying potential problems, 2) Data collection, 3) Product design planning, 4) Product creation, 5) Development: Internal testing.

The number of samples for internal testing was 3, which was planned to be conducted by 3 experts: an expert in books, an expert in media, and an expert in materials. User group testing was conducted with 30 pregnant women using the Isaac and Michael formula, which calculates the sample size from a known population. The population in this study consisted of 71 pregnant women at the Pondok Meja Health Center in Muaro Jambi Regency. Samples were taken using non-probability sampling, specifically systematic sampling. The sample size was determined using the Isaac and Michael formula.

$$s = \frac{\lambda^2 . N . P . Q}{d^2(N-1) + \lambda^2 . P Q}$$

Keterangan:
s = Sample size
X2 = Chi-Square value, which depends on degrees of freedom and the level of significance. For 1 degree of freedom and a 10% error level, the Chi-Square value is 2.706.
N = Population size
P = Probability of success (0.5)
Q = Probability of failure (0.5)
d = Difference between the sample mean and the population mean, which can be 0.01, 0.05, or 0.10

$$s = \frac{48,0315}{1,3765} = 34,89393,$$ Therefore, the sample size in this study is 35 people.

Data collection was done by distributing questionnaires. Internal testing was conducted with the expectation of producing a product that is suitable for production. The feasibility of the product was assessed based on the quality evaluation questionnaire

RESULTS
Potential Problems and Data Collection

Based on interviews with healthcare workers at the Pondok Meja Health Center in Mestong District, the KIA (Child and Maternal Health) book has shortcomings in dental health coverage. The book does not include guidelines for dental care during pregnancy and its benefits for child health. The pocket book focuses solely on stunting prevention in children, without addressing the connection to the dental health of pregnant women. According to the literature review, there is no book that integrates maternal and child health, dental health, and stunting prevention. Therefore, research is needed to develop a dental health guidebook for pregnant women as a measure to prevent stunting risk and as a supplementary information source to the KIA book**.**

Internal Testing
The internal testing phase was conducted in August 2024 with 3 expert validators: Pahrur

Razi, SKM., MKM (Lecturer in Public Health at Poltekkes Kemenkes Jambi; Deputy Director 1 at Poltekkes Kemenkes Jambi) as the media expert; Ary Irfan, the Book Expert (Secretary of the Public Health Study Program at Poltekkes Kemenkes Jambi); and drg. David Rudi, M.Kes, as the expert in dental and oral health. This validation was carried out to obtain data used as a basis for revising the media product developed, namely the monitoring book for maternal dental health to prevent the risk of stunting. The recap of the experts' assessments can be seen in Table 1.

Table 1
Results of Expert Validation Testing for the Maternal Dental Health Monitoring Book to Prevent Stunting Risk

Indicator	Value			Total
	V1	V2	V3	
Book Cover Aspect	15	14	15	44
Book Content Aspect	45	45	43	133
Book Anatomy Aspect	25	22	22	69
Total	85	81	80	246

The total score is 246 and the overall score is 255.

Value = total score / overall score X 100%

246 / 255 X 100% = 96% (very feasible)

Respondent Validation

Table 1
Results of Respondent Validation Testing for the Maternal Dental Health Monitoring Book to Prevent Stunting Risk

No	Component	Value
1	Interest	899
2	Content	305
3	Language	442
Total		1646

The total score is 1646   the overall score is 1925
Value = total score / overall score X 100% X 100%
1646 / 1925 X 100% = 86% (very feasible)

DISCUSSION

Research indicates that poor dental and oral health during pregnancy can lead to complications such as preterm birth and low birth weight, which are risk factors for stunting. According to Soares et al. (2020), inflammation caused by periodontal disease in pregnant women can increase the risk of preterm birth and low birth weight, both of which are direct risk factors for stunting. (6) Effective health education, particularly that which is easily accessible and understandable for pregnant women, can enhance their knowledge about the importance of maintaining dental and oral health. (7) This aligns with the findings of this book, which is rated as easy to understand and capable of motivating pregnant women to engage in dental care. A study also shows that well-designed educational media can raise pregnant women's awareness of dental and oral health risks that impact child health.

(8) The respondent validation indicating that this book is needed not only in educational settings but also in the broader community is supported by research highlighting the importance of community empowerment and health cadres in providing education related to maternal health. The research found that the involvement of midwives, extension workers, and posyandu cadres is crucial for disseminating health information to the community. (9) The book is also considered practical as it allows pregnant women to learn at home without the need to attend seminars. This is supported by research showing that learning media accessible at home, such as guidebooks or digital formats, is highly effective in improving health knowledge among pregnant women due to its flexibility in time and place. (10) Bedjo, Anwar and Muliadi's (2019) research on the development of educational games shows that the value of the Monopoly game's feasibility score as an Android-based dental health education media was given by expert validators an average of 82.62% with a very feasible category. (11) The validation process by experts is very important in developing products or media. This is in line with the opinions of experts who state that expert validation tests and limited trials in the field need to be carried out to produce products that can improve the quality of education. (12)

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