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Innovation in Dental Health Education with Card Towards Healthy Teeth (KMGS) to Increase the Knowledge and Skills of Mothers Under Five in the Prevention of Caries in Jabungan Village, Semarang

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ABSTRACT

Dental and oral health problems are still a challenge in Indonesia, especially in early childhood. Based on the 2018 Riskesdas, in the city of Semarang, 37.20% of children experienced cavities, while the prevalence of caries in children aged 3-4 years reached 81.5%. The DMF-T value in that age group was 4.9 and increased to 6.7 at the age of 5, which is very high. This condition confirms the importance of the role of parents, especially mothers, in early prevention. This condition emphasizes the importance of the involvement of parents, especially mothers, in early prevention. Posyandu has indeed provided education, but the use of the Card for Healthy Teeth (KMGS) is still limited and has not fully involved the active role of parents. This study aims to analyze the influence of KMGS as an educational medium for mothers under five in improving knowledge and skills to maintain children's dental health. The method used was a quasi-experiment with a *pretest-posttest* design on 15 mothers under five at the Posyandu of Jabungan Village with data analysis using the Wilcoxon test. The results showed a significant increase in the knowledge ($p=0.014$) and skills ($p=0.007$) of mothers after being given the intervention. Thus, the use of KMGS is proven to improve the knowledge and skills of mothers in maintaining children's dental health

Keywords: knowledge; Skills; KMGS; Toddler Mother

Introduction

According to Basic Health Research (Riskesdas) data in 2018, the prevalence of dental and oral problems in Central Java reached 56.66%, with the most cases in the form of cavities at 43.45%. In Semarang City, the problem of cavities is 37.20%. In the age group of 3-4 years, the proportion of cavities reached 36.4% while the prevalence of caries was 81.5%. According to a study of [1] *Early Childhood Caries (ECC)* in Southeast Asia, the incidence rate of caries in children aged 5-6 years reaches 79%. Meanwhile, in Indonesia, based on the 2023 Indonesian Health Survey, as many as 57% of the population with the age of ≥ 3 years old experience dental and dental problems. In particular, the DMF-T index in children aged 3-4 years is relatively high, which is

4.9. In children of 5 years of age, DMF-T values increase to 6.7 which is in the very high category . [2] [3]

Efforts to maintain dental health need to start from the age of children, where the involvement of parents, especially mothers, plays an important role in instilling good habits. Given the high prevalence of cavities in early childhood today, strategic steps are needed to improve good knowledge and skills, mothers can play a role in accompanying and guiding children under five to maintain and maintain optimal dental and oral health. [4]

The Integrated Service Post (Posyandu) is one of the strategic community-based health service forums to improve the health of mothers and toddlers. Several studies prove that posyandu cadre training can increase the knowledge and skills of

cadres in providing dental health education to the community. [5,6]

Permenkes No.80 of 2015 emphasizes that the Card Towards Healthy Teeth (KMGS) is an instrument of community empowerment to increase independence in the field of dental health. Through a color-based assessment system, KMGS allows mothers and posyandu cadres to identify the risk of early caries in the milk teeth of children under five. KMGS has been used to assess the risk of caries in pregnant women [6] and toddlers [7]. However, the training focused on Posyandu cadres. In addition, the use of KMGS in Posyandu is still low, there has not been much use of KMGS, especially in Posyandu. Therefore, it is necessary to involve parents, especially mothers of toddlers so that they can play an active role in preventing the incidence of dental disease in toddlers from an early age by using KMGS.

The urgency of this research is based on the importance of preventing dental and oral diseases from the age of toddlers, with the role of mothers as educators as well as supervisors of children's dental health. The interventions provided are expected to be able to increase mothers' knowledge and skills in maintaining the dental health of toddlers. Mothers play an important role in instilling positive behavior in children for dental and oral health. This involvement can be realized through attention to children's habits and behaviors related to dental health. Mothers' knowledge, attitudes and behaviors have been proven to have a great influence on the formation of children's knowledge, attitudes and behaviors. Therefore, this study aims to determine the influence of the use of the Card Towards Healthy Teeth (KMGS) as an educational medium for mothers of toddlers in improving knowledge and skills in maintaining children's dental health.

Methods

This research was carried out by making a study of materials and concepts for KMGS for toddlers. This study uses a *one group pre-test post-test design*. The research design used was pre-experimental by conducting before and after interventions for parents' knowledge and skills in maintaining the dental health of children under five. The population in this study is all mothers under five in Jabungan Village, Semarang City totaling 15 mothers and toddlers. The instrument used is the Card Towards Healthy Teeth (KMGS) while the instrument for the level of knowledge and skills of dental health uses a questionnaire.

Results and Discussion

The study has been conducted on fifteen mothers with toddlers at the Posyandu of Jabungan Village. A pre-test *questionnaire* was given to respondents before counseling with KMGS was given. Each respondent filled in according to real conditions at the level of knowledge and skills. After that, a *post-test* is carried out to obtain data related to the results of the intervention that has been carried out. The results of changes in knowledge and skills in each respondent are presented in Table 1 below:

Table 1 Pre-test and Post-test Results

	Knowledge		Skills	
	Pretest	Post Test	Pretest	Post test
Average	13,3	14,4	6,8	9,1
Standard Deviation	1,89	0,97	1,62	0,74

Based on Table 1, the average knowledge score increased from 13.3 in the pre-test to 14.4 in the post-test (an 8.3% increase), while the skill score increased from 6.8 to 9.1 (a 33.8% increase), with the data distribution concentrated around the mean. This significant improvement was not solely due to the KMGS itself, but resulted from the synergy between visual-interactive education through KMGS and health counseling. KMGS facilitated understanding, while counseling provided practical guidance, making the combination a more effective active educational intervention than a single approach.

Table 2 Wilcoxon Test Results of Mothers of Toddlers in Dental Health Maintenance

Variable	N	Positive Rank	P value
Knowledge	15	12	0,014
Skills	15	14	0,007

The Wilcoxon test results showed a significant increase in knowledge ($P = 0.014$) and skills ($P = 0.007$) of mothers of young children after the KMGS intervention, with the majority of respondents showing improved scores. These findings confirm the effectiveness of KMGS in enhancing the knowledge and skills of mothers in child dental care.

Dental caries is still the most common dental problem experienced by children. According to the 2023 Indonesian Health Survey, as many as 57% of the Indonesian population from the age of 3 years and above have experienced dental and oral complaints. Although this figure shows a decrease

of 0.5% compared to the results of the 2018 Riskesdas which reached 57.6%, the prevalence of dental problems in the group of children is still relatively high. In the toddler age group, the DMF-T index is 6.7 which is classified as very high. These findings indicate that the severity of tooth decay in toddlers is at a high level [3].

Mothers have an important role in shaping children's behavior during the growth period, especially in maintaining dental health. Children tend to imitate their parents' habits and these habits if done repeatedly will become a routine that shapes behavior. Therefore, instilling the habit of maintaining dental health from an early age is very important so that these good behaviors can be carried over into adulthood. Thus, the role of mothers is very crucial in forming dental health habits in children. The first step that can be taken is to assess the level of knowledge and knowledge between mothers and children of toddler age, so that appropriate efforts can be made to increase the knowledge and skills of mothers in seeing children's dental health. [4]

Based on the results of the study, the average *pre-test* score on knowledge was 13.3. This value increased to an average of 14.4 in the *post-test* results. Meanwhile, the average skill *pre-test* score of 6.8 increased to 9.1 in the *post-test*. The results showed an increase in both aspects of knowledge and skills after being given an intervention in the form of KMGS. Furthermore, the increase was statistically tested by the Wilcoxon test. The test results showed a p-value of 0.0014 for knowledge and 0.007 for skills. Thus, it can be concluded that KMGS has a significant effect on improving the knowledge and skills of mothers under five.

The Card for Healthy Teeth (KMGS) is a health card that records the development of children's teeth and the risk of caries. This card can help parents in their efforts to maintain their children's dental health. So that children's dental health can be monitored intensively through dental health cadres in a simple way. The use of KMGS helps parents in monitoring dental health while improving their knowledge and skills in dental care. Continuously, KMGS contributes to forming positive behaviors related to dental health in children and parents, thereby supporting the prevention of dental and oral diseases in toddlers [6]

The use of KMGS in Posyandu has been applied through Posyandu cadres in 205 toddlers. The results of recording with KMGS showed that 77.6% of toddlers had low def-t values, 14.1% were

in the medium category and 8.3% were in the high category. In addition, KMGS is also able to map the risk of caries in children, namely as many as 18 toddlers have a high risk of caries, 41 toddlers are at moderate risk and 146 toddlers are at low risk. Based on these results, it is proven that KMGS is effective in supporting preventive activities for the prevention of dental diseases, through information provided related to the risk of dental caries. [6]

For parents, especially mothers, KMGS is a useful educational tool to understand the potential for tooth decay in children as well as gain knowledge about preventive measures so that the risk of caries can be minimized. The role of mothers in maintaining children's dental health has been proven to have a significant influence. This is supported by research results that show a relationship between the mother's level of knowledge and the incidence of caries in children, where the statistical test produces a p-value of 0.00. This means that mother's knowledge about dental health has an effect on the incidence of child caries. The study also revealed that children of mothers with a good level of knowledge about dental health had a 0.583 times lower risk of caries compared to children of mothers with less knowledge [7].

Dental health is a fundamental aspect that needs to be formed from an early age. Dental health disorders not only affect children's comfort of eating, but also impact their ability to socialize. In childhood, socialization has an important role as a process to interact and blend with peers. However, when children have dental problems, they can face barriers to socializing, such as difficulty speaking due to pain in the teeth. In addition, the aesthetic aspect of teeth also affects the child's psychological condition, where the disorder can reduce the child's confidence level and trigger psychosomatic problems. Research proves that there is a link between dental health and self-confidence. The study conducted on 62 students showed a significant relationship between OHI-S status and confidence levels, with a p-value of 0.000. This shows that healthy and well-maintained teeth play an important role in increasing children's confidence when interacting, both with peers and with others around them. [8] [9,10] [11] [12]

Child development is interrelated in various factors. One of them is through positive and supportive initial interactions with parents. Parents, especially mothers, play an important role in shaping children's behavior. Therefore, increasing parental knowledge is important in order to have a positive influence on children's dental health.

Individuals with good knowledge of dental health, have the potential for skills and behaviors that are aligned in maintaining dental health. Parents who understand how to maintain dental health such as brushing techniques, consumption of foods that are good for teeth can reduce the risk of caries in children. [13] [14] [15,16]

Good knowledge and skills for parents, especially mothers, have an important role in early detection of children's dental health problems, such as sensitive teeth and early signs of caries in the form of *white spots*, which can be prevented through the administration of dental vitamins. In addition, parents contribute to the formation of healthy living behaviors in the family environment, so that children can imitate positive habits in maintaining healthy teeth. The presence of KMGS serves as a preventive strategy that supports parents in monitoring the health condition of children's teeth, while reducing the risk of caries. Interventions carried out at the household level, such as the use of educational media, have been shown to be effective in reducing the prevalence of caries in children. This is in line with previous research showing that education to parents contributes positively to the formation of children's dental care behaviors [18]. [17] In addition, parents play an important role in guiding children, including by teaching correct brushing techniques, choosing foods that support dental health, and getting used to maintaining regular oral hygiene behavior. These educational efforts contribute to increasing children's understanding of the importance of maintaining dental health from an early age [19].

KMGS care filling training has been proven to be effective in improving mothers' knowledge and skills regarding the maintenance of children's dental health [20]. Through KMGS, early detection of caries in toddlers can be carried out, so that prevention and treatment interventions can be provided more quickly and appropriately. In addition, children's behavior in maintaining dental health is greatly influenced by the example set by parents. Parents' consistency in brushing their teeth twice a day and making regular visits to the dentist encourages children to imitate these behaviors. Previous research has also shown that parental involvement in dental hygiene practices is closely related to an increase in similar habits in children, while also lowering the prevalence of caries [15]. The role of mothers in maintaining dental health has a significant relationship with plaque index, which was shown by the results of statistical tests with a value of $p=0.001$ [21].

Conclusion

The use of the Card Towards Healthy Teeth (KMGS) effectively improves the knowledge and skills of mothers in maintaining the dental health of their young children at the Posyandu in Jabungan Village, Semarang, and is expected to enhance community participation in early childhood caries prevention. It is recommended that Posyandu routinely implement KMGS, and that future studies conduct comparative analyses with other educational media to further validate its effectiveness as an innovative intervention.

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