



(RESEARCH ARTICLE)



EARLY CHILDHOOD DENTAL CARIES: A DESCRIPTIVE STUDY IN CEMOROKANDANG SUBDISTRICT, MALANG

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ABSTRACT

Dental caries is a prevalent oral health issue among young children. The condition of primary teeth regarding caries can be assessed using the decayed, extracted, and filled teeth (def-t) index. This activity aimed to describe the primary tooth caries index based on sex and age group among children from TK Negeri Pembina 5 and TK Al Ikhlas, while also providing oral health education through game-based media. The activity involved 133 children: 55 from TK Negeri Pembina 5 and 78 from TK Al Ikhlas. Data were obtained through def-t index examinations and analyzed descriptively according to sex and age group, as well as through the implementation of dental health education using "UTAGI" learning media. The average def-t index for all participants was 6.60, falling into the "very high" category. The average def-t scores for male participants at TK Negeri Pembina 5 and TK Al Ikhlas were 7.47 and 6.62, respectively (very high), while for female participants, the scores were 5.92 and 5.85, respectively (high). Conclusion: The primary tooth caries index ranged from high to very high; Therefore, there is a need to strengthen promotional and preventive efforts through interactive oral health education starting at an early age. This activity supports SDG 3 (Good Health and Well-being) by improving oral health and SDG 4 (Quality Education) by providing health education tailored to the characteristics of children.

Keywords: Dental caries, Def-t Index, Early childhood, Dental and Oral health.

1 INTRODUCTION

Dental and oral health is important for a healthy child because cavities in the mouth can affect the ability to eat, sleep, be active, study, and quality of life. Dental caries is one of the most common chronic diseases that can occur from the first tooth eruption. Caries in the elderly who are not treated can develop quickly and cause pain, functional disturbance, and increase the burden of disease at the next life stage.[1]

Globally, caries tooth eldest Still become problem in communities. World Health Organization (WHO) reported estimate prevalence caries tooth eldest by 43%, with around 510 million child experience caries on tooth eldest.[1] In Indonesia, the results of the Survey Health Indonesia (SKI) 2023 show prevalence caries on resident age 3–4 years of 78.3% and ages 5–9 years of 84.8%.[2] The height number the show that caries Still become problem Which need get attention since preschool age.

The occurrence of caries in children is multifactorial. Consumption of free sugars is one of the main risk factors, whereas oral hygiene, fluoride exposure, eating patterns, social economy, parental education, and previous experience caries play a role.[3–7] Systematic reviews show that the presence of previous caries lesions, high plaque levels, cariogenic microorganisms, and some family and behavioral factors are related to an increased risk of early childhood caries (ECC).[4,6,7] Therefore, early detection should be done simultaneously with promotive and preventive efforts so that caries can be recognized and children receive appropriate education.

The def-t index can be used to describe experienced tooth decay, which consists of three components: d (decay), e (exfoliation/missing due to caries), and f (filled). Simple examinations in the school environment can become part of a promotive and preventive approach because it allows for more continuous identification of children in need of attention. Early childhood education is also a strategic setting to convey health messages in a repetitive and appropriate manner to the child's developmental stage.

Method education need customized with characteristics child age early. Approach-based games can increase children's involvement in learning. A systematic review of interventions showed that learning-based games can increase knowledge of oral health and a number of indicators of mouth cleanliness compared to conventional education methods, although quality and heterogeneity need to be noted. [8] In preschool, education using a game board themed tooth health also reported increased knowledge and a short-term improvement in mouth cleanliness.[9]

This activity aimed to describe the caries tooth eldest based on type sex, and group age on state kindergarten participants at Supervisor 5 and Al Ikhlas Kindergarten in the Cemorokandang Subdistrict, Malang City, as well as perform DHE UTAGI as part from effort promotional and preventive. Subsequently, Dental Health Education (DHE) was conducted using *Ular Tangga Gigi* (UTAGI)—a game-based educational tool that integrates oral health messages with play activities, making it suitable for the characteristics of young children. From the perspective of sustainable activities, this participation supports Sustainable Development Goals (SDGs), especially SDG 3 (*Good Health and Well-being*) through strengthening effort promotional and preventive health tooth since age early and SDG 4 (*Quality Education*) through implementation method learning which is interactive and in accordance with the characteristics of children.

2 MATERIAL AND METHODS

2.1 Study Design and Participants

This activity aims to describe the primary tooth caries index based on gender and age group among children from TK Negeri Pembina 5 and TK Al Ikhlas. Besides detecting early caries, we also performed DHE. The activity involved 133 children from TK Negeri Pembina 5 (n = 55) and TK Al Ikhlas (n = 78). Data were obtained through def-t index examinations and analyzed descriptively according to gender and age group. This activity was held on July 29-30, 2026.

2.1.1 Demographic Characteristics

Two school partners in the sub-district Cemorokandang, District Kedungkandang, namely TK Negeri Pembina 5 and TK Al Ikhlas, with a range of age 3–7 years. The observation results began to show caries findings, and based on observation and communication with the school party, some children showed signs of clinical caries in the form of tooth holes and changes in tooth color. The examination process also faced constraints in the form of *dental anxiety*, which can influence the readiness and cooperation of children during screening. Therefore, an educational and examination approach that takes into account the characteristics of early childhood is necessary so that activities can be ongoing in a more comfortable atmosphere and support the screening process.

2.2 Intervention and Data Collection

Activity devotion to public This study used a descriptive observational approach with a cross-sectional design, which was carried out in the framework of the activity devotion to public based Community-Based Participatory Research (CBPR). Data used in this activity covers primary and secondary data. Primary data were obtained through screening or inspection of oral health tooth and mouth, namely, through inspection of the def-t index. Component d (decayed) is the oldest tooth that has caries and has not yet been patched. Component e (*extracted*) is the oldest tooth that has been extracted or has an indication of extraction due to caries. Component f (*filled*) is the oldest tooth that has been filled due to caries. The value of def -t was obtained by adding components d, e, and f. Secondary data were obtained from the party school in the form of the number of participants and biodata of the participants' activities. Inspection was performed to detect the health condition of students' teeth and mouth, in particular the existence of caries. The results were presented in the form of tables and descriptive descriptions of the participants' dental health conditions and the implementation of the program devotion to public. Following the screening, the activity proceeded with Dental Health Education (DHE) using "UTAGI" (Dental Snakes and Ladders). UTAGI is a gamification-based educational tool that integrates dental health messages into play-based activities. A game-based approach was selected because young children engage more readily with learning experiences that are concrete, interactive and enjoyable. In this activity, dental health messages were conveyed through play, ensuring that education went beyond simple one-way communication.

3 RESULTS AND DISCUSSION

The activity results devoted to the public about the implementation of promotive and preventive programs for oral health in children aged early in two school partners, namely TK Negeri Pembina 5 and TK Al Ikhlas, Malang City, with a number of participants as many as 133 children, as seen in the table below.

Table 1: Distribution participant based on type gender in TK Negeri Pembina 5 and TK Al Ikhlas, Kelurahan Cemorokandang, Malang City, 2026

Sex	TK Negeri Pembina 5 (n = 55)	TK Al Ikhlas (n = 78)	Total (N = 133)
Male	29 (52.7)	30 (38.5)	59 (44.4)
Female	26 (47.3)	48 (61.5)	74 (55.6)

Description: The percentage of participants in each column is counted.

The data in Table 1 show that the number of participants in TK Negeri Pembina 5 or more lots of various sexes, namely, 29 people (52.7%), while the number of female participants was 26 people (47.3%). Meanwhile, at TK Al Ikhlas, the number of female participants was more than 29, namely, 48 people (61.5%), compared to 30 male participants (38.5%).

Table 2: Distribution participant based on age at TK Negeri Pembina 5 and TK Al Ikhlas, Kelurahan Cemorokandang, Malang City, 2026

Umur (tahun)	TK Negeri Pembina 5 n (%)	TK Al Ikhlas n (%)	Total n (%)
3	1 (1.8)	1 (1.3)	2 (1.5)
4	5 (9.1)	10 (13.3)	15 (11.5)
5	29 (52.7)	36 (48.0)	65 (50.0)
6	20 (36.4)	27 (36.0)	47 (36.2)
7	0 (00)	1 (1.3)	1 (0.8)
Total	55	75	130

Description: Percentage counted from participants with age data recorded (TK Negeri Pembina 5, n = 55; TK Al Ikhlas, n = 75; total, n = 130).

The data in table 2 shows that participant most based on Age at TK Negeri Pembina 5 is participant 5 years old as many as 29 people (52.7%), while least number of participants 3 years old as much as 1 person (1.8%). No there is participant 7 years old. At TK Al- Ikhlas, the most participants were also 5 years old, as many as 36 people (48.0%), while the least number of participants were 3 years and 7 years, each 1 person (1.3%).

Results of activities for TK Al Ikhlas participants showed that based on type gender, participants Woman higher Lots compared to participant boys, namely 48 children (61.5%) and 30 children (38.5 %), respectively. Based on group age, participants most is at the age of 5 years namely as many as 36 children (48.0%), while least number of participants were at the ages of 3 years and 7 years, each with 1 child (1.3%). There were also three children (3.8 %) with missing age data recorded. Distribution the describe characteristics participants who took part activity inspection health teeth and mouth at TK Al Ikhlas.

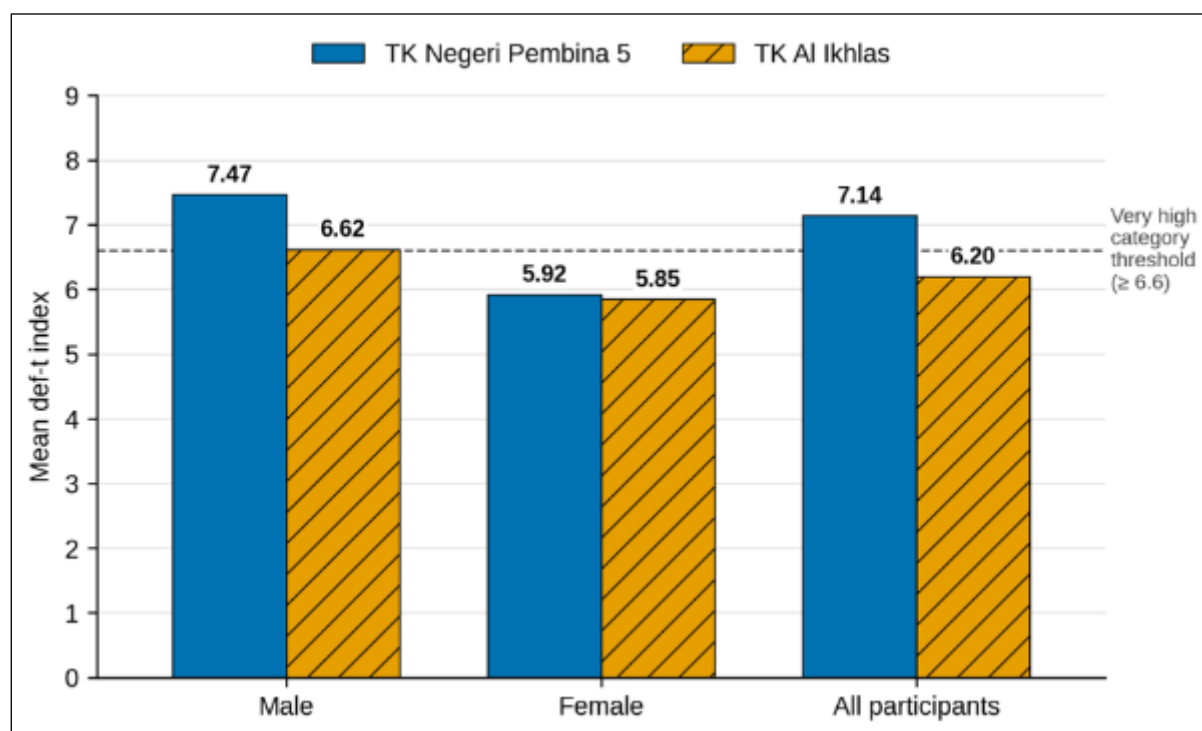


Figure 1: Average index caries (def-t) based on type gender of participants activities at TK Negeri Pembina 5 and TK Al Ikhlas

Figure 3 shows that the average index caries (def-t) based on type gender at TK Negeri Pembina 5 obtained an average index caries in participants man of 7.47, which is in the category very high, while the participants Woman of 5.92, which is in the category high. The average index caries overall participants of Pembina State Kindergarten 5 amounted to 7.14, including category very high. At TK Al- Ikhlas, the average index caries participant man of 6.62 with category very high, whereas participant Woman of 5.85 with category high. The average index caries overall of 6.20, including category tall.

High def-t value show existence experience enough caries big on teeth eldest participants. Findings This in line with description 2023 National SKI which shows prevalence caries high in the group ages 3–4 years and 5–9 years.[2] Average def-t boys taller compared to women on both schools. Findings the is description descriptive and not prove that type sex is factor reason differences. Meta- analysis about predictor ECC enhancement does not find type sex as significant factors to improvement experience caries. [4] Other factors such as history caries, plaque, sugar consumption, habits cleanliness teeth, exposure fluoride, and factors family more relevant for considered in effort prevention. [3–7]

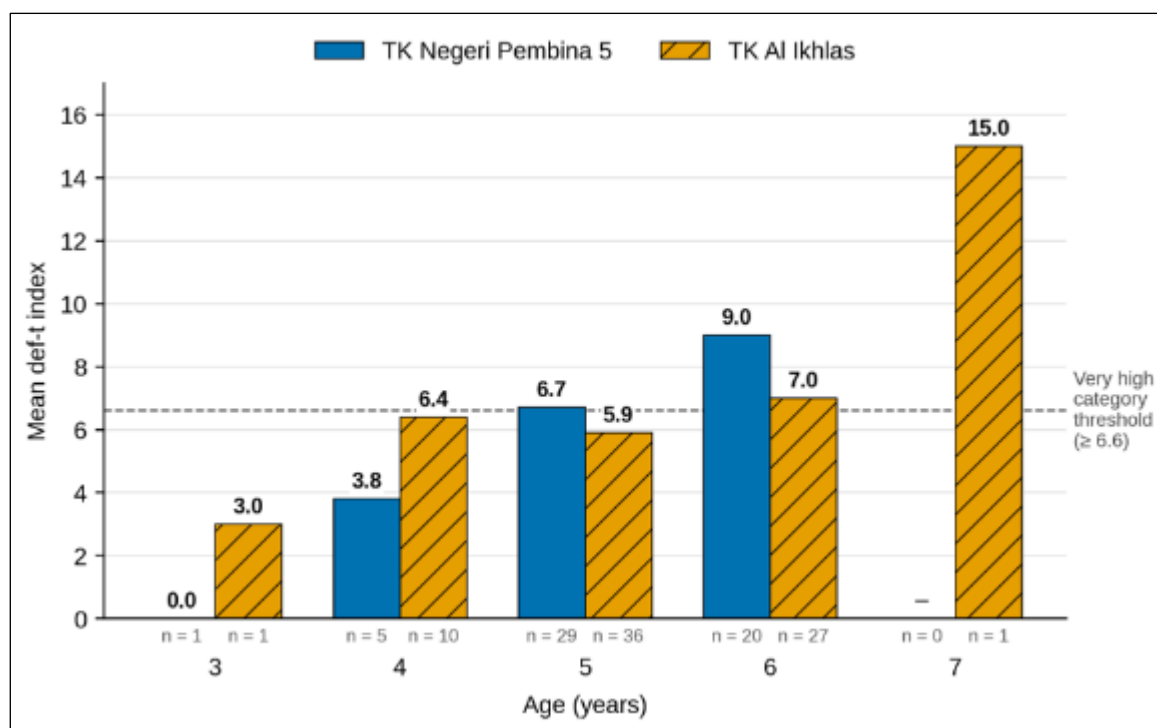


Figure 2: Average index caries (def-t) based on age of participants activities at TK Negeri Pembina 5 and TK Al Ikhlas

In Figure 4, TK Negeri Pembina 5, the average def-t based on age is 0.0 at age 3 years, 3.8 at age 4 years, 6.7 at age 5 years, and 9.0 at age 6 years. The highest value found at age 6 years (9.0). At Al Ikhlas Kindergarten, the average def-t was 3.0 at age 3 years, 6.4 at age 4 years, 5.9 at age 5 years, 7.0 at age 6 years, and 15.0 at age 7 years.

Increased def-t values in the older age group can reflect the accumulation of caries during tooth development in the cavity mouth. WHO states that tooth decay eldest can started since eruption teeth and can develop become damage wide if No prevented or handled.[1] Experience caries previously was also one of predictor important occurrence ECC enhancement. [4,6] Therefore that, screening since age preschool important for find lesions more beginning and giving education before damage become more weight. Average def-t male taller compared to women on both schools. Findings the is description descriptive and not prove that type sex is factor reason differences. Meta- analysis about predictor ECC enhancement does not find type sex as significant factors to improvement experience caries.[4] Other factors such as history caries, plaque, sugar consumption, habits cleanliness teeth, exposure fluoride, and factors family more relevant for considered in effort prevention. [3-7] High def-t findings until very high on both schools show the need for a maintenance strategy health sustainable tooth. Prevention caries in children need covers control sugar consumption, hygiene good teeth, use of toothpaste fluoride in accordance age, and inspection tooth in a way periodically.[3,11] WHO recommends brushing tooth twice a day with toothpaste fluoride ; for child ages 3-6 years used toothpaste as big as size peanut pod with adult supervision.[11] Approach-based schools or parks for children can be one of the strategies for expanding range promotion health tooth Because children can receive consistent messages from power health and teachers. Evidence from a review of systematic shows that the promotion program health tooth based school can give benefits on knowledge, behavior, and several indicator health teeth, although results interprogram varies.[10] In context activity this, combination def-t screening and dental health education.

4 CONCLUSION

The oldest participants in TK Negeri Pembina 5 and TK Al Ikhlas 2026 showed a high yield until very high, with an average def-t index of 7.14 and 6.20, respectively. The results obtained showed that caries was higher in male participants than in female participants and showed variation based on age, with the highest reaching 9.0 at Pembina State Kindergarten 5 and 15.0 at Al Ikhlas Kindergarten. Findings This confirms that caries in the oldest children still become significant health problems in preschool children; therefore, strengthening continuous promotive and preventive interventions is required from an early age, accompanied by periodic tooth inspection to support the early detection and handling of caries.

STATEMENTS ON COMPLIANCE WITH ETHICAL STANDARDS

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Disclosure of conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this manuscript. No financial, institutional, or personal relationships exist that could have influenced the work reported in this paper. The authors also declare that they have no competing interests with any products or institutions mentioned in the study.

Statement of informed consent

Informed consent was obtained from all participants included in the study. Participants were briefed on the purpose, voluntary nature, and use of anonymized data from the pretest and post-test assessments for academic and publication purposes.

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