

Childhood Caries Reduction Program for 3-5 Year-Olds in Culver City

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Abstract

This program's overall goal is to contribute to the reduction of childhood caries in Los Angeles County. Given that caries is a preventable chronic disease that leads to school absence and may cause pain and discomfort that leads to malnutrition, it is important to instill good oral hygiene habits in young children. To achieve this goal, the research group chose to promote and educate oral health to preschool-age children between 3-5 years old. We conducted a survey by a show of hands regarding the kids' dental care knowledge at home. We also assessed the snacks/meals provided by the school, their water source, and water intake frequency. The assessments lead to the conclusion that there is an increased risk of childhood caries within the target population. This is due to a minimal understanding of proper oral health care, high consumption of sugary snacks, and minimal understanding of the benefits of fluoridated water. The program plan consisted of demonstrating proper oral care on tooth models, printing laminated pictures of teeth to show how to remove caries referred to as "sugar bugs", as well as to play a sorting game between healthy and cariogenic snacks. The plan was then implemented through three consecutive visits. Throughout the visits, oral hygiene education, nutritional counseling, and hands-on activities were enacted. Additionally, the students were also provided with goodie bags which included tooth-brushing log sheets that tracked their progress, sugar-free lollipops, and a 2-minute sand timer. The tooth-brushing log sheets were provided twice to monitor progress after the initial visit. Finally, our evaluation consisted of conducting the initial survey and reviewing the provided tooth brushing logs. The program was a success in that there was an increase in children brushing their teeth for 2 minutes long, an increase in children identifying at least 3 healthy snacks, and an increased number of children brushing twice daily.

Introduction:

Childhood caries is a significant public health problem that affects millions of children worldwide. In the United States, the Los Angeles County Department of Public Health (2021) reported that between 2013-2016 an average of 27.9% of children aged 3-5 had a history of dental caries. The prevalence of childhood caries is particularly high among low-income and minority populations. However, it does not exclude middle-high income or non-Hispanic whites. According to the Los Angeles County Smile Survey, 2020 46.8% of children within the same age group have had a history of dental caries. In Culver City, California, the prevalence of childhood caries is also a concern, and on average, according to The University of Southern California School of Dentistry, elementary school-aged children miss 2 days of school due to dental-related problems. Due to these statistics, there is a need to develop an oral disease program to reduce childhood caries, particularly for 3–5-year-old children.

Assessment:

The program's target population is preschool children at Home Sweet Home Preschool & Toddler Discovery Center in Culver City, California. The children are between the ages of 3 and 5 years old. This population has a minimal understanding of oral health care and oral disease progression. They comprise a group of 31 children who belong to middle-upper-class families. Due to their young age, children of this age group generally have minimal dexterity control to independently perform adequate routine oral hygiene. To assess their initial knowledge and understanding of oral health care we provided the children with a verbal survey with questions aimed to determine their daily brushing habits, knowledge of dental care, and their knowledge of healthy foods vs. bad (cariogenic) foods. Each child was assisted by a clinician during the survey process to ensure understanding of each question and accurately record each response. The survey was made up of eight questions asking children the following: "Do you brush your teeth every day?, How many times do you brush your teeth every day?, How long do you brush your teeth for?, Do you floss?, Do you brush your tongue?, Do you have any pain in any of your teeth?, Do you drink water with your snacks?" and, "Can you list at least three healthy snacks?". Furthermore, brushing logs were distributed to the preschool teachers to record daily brushing habits during a one-week period. To accomplish this, each morning upon arrival, preschool teachers were asked to question each child if they brushed their teeth that morning (AM) and if they brushed their teeth the prior night (PM) before going to bed. Based on the child's response, preschool teachers recorded "yes" indicating the child did brush, or "no" indicating the child did not brush his/her teeth. Two answers were recorded each day. Pre-school teachers were also interviewed to assess snacks provided to the children during school hours, water source and consumption during school hours, and any outstanding lack of oral hygiene care that should be

noted. Snacks provided included pancakes with maple syrup, quesadillas, potato chips, and fruit. Pre-school teachers reported that children have access to fluoridated water during mealtimes and water breaks. According to the 2019 Los Angeles County Status of Community Water Fluoridation Oral Health Programs Culver City, California maintains optimum fluoridation with an average fluoride concentration of 0.7 mg/L.

Diagnosis:

Based on the assessment, the oral health needs identified pose an increased risk for the development of childhood caries. This is due to the minimal understanding of proper oral healthcare and disease progression, poor brushing habits, consumption of snacks that are high in sugar, lack of knowledge about alternative oral hygiene tools, and lack of understanding concerning the benefits of fluoridated water. These needs were determined based on the pre-implementation survey results which concluded that 93% of children brushed their teeth every day and 7% of children did not. 74% of children reported brushing their teeth at least once a day and 26% reported they brushed their teeth at least twice a day. When asked how long they brush their teeth, 93% reported they brushed their teeth less than two minutes each time they brushed and 7% stated they brushed their teeth for more than two minutes each time they brushed their teeth. 17% of children floss their teeth and brush their tongues while the other 83% did not floss or brush their tongues. Fortunately, 0% reported having any dental pain. Water consumption during snack time was almost 50/50 with 51% having water intake with their snacks and the other 49% didn't. Only 25% of children were able to accurately identify three healthy snacks.

Planning:

SMART objectives are essential tools for accomplishing goals, and this is particularly true when it comes to promoting healthy habits among children. Three key objectives that can help to reduce the risk of childhood caries include improving children's knowledge of oral health, their role in maintaining oral health and improving their understanding of healthy eating.

SMART Objectives:

1. Immediately after the child lesson plan presentation, the number of children who brush their teeth for 2 min will increase from 6.5% (2/31) to 70.9% (22/31).
2. Immediately after nutrition counseling, the number of children able to identify at least 3 healthy snacks will increase from 35.5% (11/31) to 100% (31/31).
3. 1 week after lesson plan implementation the number of children who brush twice or more a day consecutively each day every week will increase from 25.8% (8/31) to 80.6% (25/31) as portrayed on the tooth brushing log.

All three of our objectives are important for the prevention of tooth decay and the promotion of good health. Our approach for the first objective is to encourage children to brush for a longer period of time. The American Dental Association recommends that children brush for at least two minutes twice a day. Both parents and educators can take part in helping children develop better oral hygiene habits by setting a goal to increase their brushing time. With regard to nutrition, many children do not understand the importance of eating a balanced diet and the impact it can have on their oral health. By teaching children about nutrition and encouraging them to choose healthy snacks, it can help to prevent caries, obesity, and other health-related problems. When it comes to brushing, many children only brush once a day, which is not enough

to remove all the plaque and bacteria that build up after eating and can lead to decay. With these goals in mind to develop and implement this program, children will build healthy habits that they can carry with them throughout their life.

The plan to achieve these goals is essential. To begin, collective efforts will be made by all eight clinicians to educate and demonstrate proper brushing and flossing techniques utilizing child-friendly lesson plans, Colgate mouth models, laminated images of smiles to brush the sugar bugs away, and flossing activities using play-doh and egg cartons. To engage the children in nutritional counseling, pre-printed images of foods are utilized to match the foods in their designated “healthy” or “bad” categories. Children are more likely to participate in these fun and interactive activities and positive feedback by clinicians will motivate the children to maintain healthy oral habits at home. A reward system will be implemented to encourage kids to participate and reap the benefits of new oral hygiene knowledge.

Implementation:

One week after the initial assessment we returned to Home Sweet Home Preschool & Toddler Discovery Center to implement the oral disease program to reduce the risk of childhood caries in 31 children aged 3-5. The program was designed to include various components such as oral hygiene instructions, nutritional counseling, hands-on activities, a 1-week tracking log, goodie bags, and incentives. The oral hygiene instructions provided in the lesson plan are designed to teach children proper brushing techniques, flossing techniques, and how often they should brush. Utilizing the tell-show-do method on Colgate teeth models we advised the children to brush at a 45-degree angle and in a circular motion across all teeth. Children were reminded not to forget to brush their tongues before finishing. Utilizing floss picks we were able to

demonstrate modified C-shaped flossing techniques. Nutritional counseling was also included to educate children about the impact of their diet on their oral health. We prepared printed images of healthy and bad foods and asked the children to separate the images into healthy or bad categories. Incentives such as sugar-free lollipops and 2-minute sand timers were provided to encourage children to participate actively in the lesson plan. Those who participated in the activities or answered questions during the lesson plan were given these incentives. Before departing we left the children with toothbrush logs to take home to help them keep track of their brushing habits. We also left them with goodie bags containing age-appropriate dental aids and a tooth snack guide to continue actively putting into practice what they just learned. Hands-on activities were essential to this implementation as they provided children with a practical understanding of oral hygiene practices to utilize at home in everyday life. This created much enthusiasm amongst the children to engage in learning about oral hygiene.

Evaluation:

Program evaluation is a crucial aspect of any program, as it helps to determine the effectiveness of the program and identify areas for improvement. To evaluate, the initial verbal survey was re-implemented for all 31 children with the help of all eight clinicians. We went back to the school a week after the initial survey. Pre and post-implementation surveys were assessed, and the results reflected a modest increase in positive oral hygiene routine and nutritional understanding. Toothbrush logs were also assessed to determine if the participants were following the program's recommendations. The percentage of children who brushed their teeth every day remained the same. However, 38% of children reported brushing their teeth at least once a day and 62% reported they brushed their teeth at least twice a day, an increase from the initial 26%. When asked again how long they brush their teeth, 51% reported they brushed their

teeth for less than two minutes and 49% stated they brushed their teeth for two minutes or more. 30% of children floss their teeth which is an increase from the initial 17%. With regard to brushing their tongue, an additional 16% now brushed their tongue (a newly combined total of 33%). Still, there weren't any children who reported having any dental pain. Water consumption during snack time increased to 64% from 51% and now 45% of children were able to accurately identify three healthy snacks. The comparison of pre and post-implementation surveys allowed us to establish benchmarks or standards and made it possible for us to determine if program objectives were met. Despite efforts, it wasn't possible to meet the program's objectives, but we are confident that the limitations we encountered will guide future program development. Some of the limitations included the relatively young age of the target population and the lack of parental involvement during the program. Parents and caregivers should be educated about the importance of oral health and the risks of childhood caries. This can be done through community outreach programs, workshops, educational materials, and providing incentives. The young age of the children requires extensive parental involvement to begin oral hygiene practices from an early age. Repetition will set good dental habits as the child grows. Lastly, our team lacked IRB approval which prevented us from performing dental screenings and dental indices for more accurate measurements and analysis of the dental conditions in this particular age group.

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