

45th Biennial Convention (16-20 November 2019)

Linking Tooth Brushing Behavior in Children and Oral Microbiota

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Background: The World Health Organization (WHO) priority focuses on children's oral health (WHO, n.d.). In the United States, children between the ages of 5 to 17 years old, are in distress because of poor oral health. Recently the oral microbiota suggested to be associated with oral health. Research suggests oral behavior such as tooth brushing and flossing alleviate and modulates oral microbiota.

Purpose of the study: The purpose of this feasibility study is to understand the relationship between the oral microbiota of children and tooth brushing behavior.

Subject: Convenience sample of approximately 20 participant children aged 7-12 years attending a community dental clinic, including both genders and from different socioeconomic status, and 94 oral microbiota samples.

Research Design: This study is an observational study.

Procedure: The recruitment site was a community dental clinic. Participants were screened based on the eligibility criteria. Parental consent and child assent was obtained. The parent completed a demographic questionnaire, and the child completed the other questionnaires. Research team members collected child oral specimens and dental records.

Instrument: Two questionnaires used to collect information on demographics and oral health behavior. Dental record and child oral swabs collected for oral health and oral microbiota information, respectively.

Data analysis: PCR amplification and sequencing of 16S rRNA conducted to analyze oral microbiota samples. Descriptive statistics used to characterize demographics and main variables. Pearson's correlations and linear regression analysis was used to look for associations between microbiota content and tooth brushing behavior to address research questions.

Findings: The proportion of children in this study brush their teeth once or twice a day was 48.3%. The composition of the oral microbiota was determined at six distinct mouth sites such as upper and lower palates, upper and lower teeth, right and left cheeks for each participant, and the positive correlation between oral microbiota and tooth brushing.

Title:

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Keywords:

Children, Tooth brushing and oral microbiota

References:

- Calderon, S., & Mallory, C. (2014). A systematic review of oral health behavior research in American adolescents. *The Journal of School Nursing, 30*(6)1-8.
- Dye, B. A., Li, X., & Thornton-Evans, G. (2012). Oral health disparities as determined by selected Healthy People 2020 oral health objectives for the United States, 2009–2010. *National Center for Health Statistics Data Brief, (104)*, 1-8.
- Gevers, D., Knight, R., Petrosino, J. F., Huang, K., McGuire, A. L., Birren, B. W., & ...Huttenhower, C. (2012). The Human Microbiome Project: A Community Resource for the Healthy Human Microbiome. Doi:10.1371/Journal.Pbio.1001377, doi:10.1371/journal.pbio.1001377
- McElroy, K. G., Seon-Yoon, C., & Regan, M. (2017). CE. Health and the Human Microbiome:A Primer for Nurses. *American Journal of Nursing, 117*(7), 24-42.
- Proctor, L. M. (2016). Review: The National Institutes of Health Human Microbiome Project. *Seminars In Fetal And Neonatal Medicine, 21*(The Human Gut Microbiome and Perinatology), 368-372. doi:10.1016/j.siny.2016.05.002
- Whitmont, R. (2015). Chronic Illness and the Human Microbiome. *American Journal Of Homeopathic Medicine, 108*(3), 115-123.
- World Health Organization. (n.d.). Oral Health: Oral health priority action areas. Retrieved from http://www.who.int/oral_health/action/en/
- Zongxin, L., Jianming, K., Peng, J., Chaochun, W., Yuezhu, W., Zhiwen, P., & ... Charlie, X. (2010). Analysis of Oral Microbiota in Children with Dental Caries by PCR-DGGE and Barcoded Pyrosequencing. *Microbial Ecology, (3)*, 677.

Abstract Summary:

The participants will discover the relationship between the oral microbiota of children and toothbrushing behavior. The participants will differentiate the association between oral microbiota and children toothbrushing behavior.

Content Outline:

Introduction: The World Health Organization (WHO) priority focuses on children's oral health (WHO, n.d.). The purpose of this feasibility study is to understand the relationship between the oral microbiota of children and toothbrushing behavior.

Main point: With this positive relationship is directly affected by the frequency of tooth brushing of flossing in the oral microbiota environment. Increase production of biofilm and acidity environment from bad oral microbiota increase sensitivity to develop oral symptoms.

Supporting point: Finding the balance of the oral microbiota environment and the influence in tooth brushing and tooth flossing will allow the discovering of the protective benefits of this balance in the oral cavity.

Conclusion: The proportion of children in this study brush their teeth once or twice a day was 48.3%. The composition of the oral microbiota was determined at six distinct mouth sites for each participant. There is a beneficial correlation between oral microbiota and tooth brushing in this study.

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Author Summary: Dr. Calderon began establishing a research in Adolescent Oral Health. Because the long-term effects of poor oral health are serious, she has dedicated her professional career, and in particular, the major focus of my research, to adolescent oral health behavior to discover ways to improve the health and quality of life in adolescents. Specifically, she has established a program of research focused on adolescent oral behavior, oral symptoms, and oral microbiome in those with disadvantages.

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Author Summary: Dr. Chung is an assistant professor at University of Maryland. She was trained at University of Maryland and has worked on several projects funded by the NIH during her time there. Her research is focused on human gut microbiota and its implications for health in individuals with chronic kidney disease and her recent work was on temporal dynamics of gastrointestinal microbiota during pregnancy.