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Toothbrush Training for Preschool Teachers of Students with Level 3 Autism Spectrum Disorder

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Toothbrush Training for Preschool Teachers of Students with Level 3 Autism Spectrum Disorder

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Executive Summary

Background: One in 36 children are diagnosed with Autism Spectrum Disorder (ASD). Oral health for children with ASD is significantly impacted by sensory sensitivities and communication delays.
Purpose: The purpose of this project is to provide special education preschool teachers with an evidence-based oral hygiene module. This module is focused toward giving teachers the confidence and accommodations to provide a daily toothbrushing program.
Theoretical Framework. The theoretical framework used in the development of this Capstone is Cognitive Learning Theory, the Theory of Planned Behavior, and Occupational Justice.
Methods. A sampling of preschool teachers of students with level 3 ASD was used. A training module on the value and strategies for toothbrushing as a part of a preschool routine was implemented with teachers in a school district. Teachers were asked to complete a pre-survey directly following the training. They were given four weeks to implement the program and a post-survey was sent. Comparison between the pre- and post-surveys measured teachers' confidence and willingness to integrate a classroom toothbrushing program.
Results. The results of this study revealed preschool teachers are confident using their skills with sensory and communication accommodations for students with level 3 ASD in the development of a toothbrushing program in the classroom. Barriers that prevent teachers from implementing toothbrushing were staffing levels and teacher experience.
Conclusions: Preschool teachers of students with level 3 ASD are competent in using evidence based sensory and communication supports in their classrooms. The classrooms designed for children with ASD are an ideal environment to implement the routine of toothbrushing. Although, teachers are aware of the importance of toothbrushing they do not perceive this as part of their role to implement in classroom routines.

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CERTIFICATION OF AUTHORSHIP

Submitted to (Faculty Mentor's Name): _____Shirley O'Brien_____
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Title of Submission:
ToothbrushTraining for Preschool Teachers of Students with Level 3 Autism Spectrum Disorder

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Student's Signature: ___*Cheryl Domino*_____

Date of Submission: _____11/10/23_____

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Section I: Nature of Project and Problem Identification

Autism spectrum disorder (ASD) is a developmental delay that significantly impacts communication and social interaction. The prevalence of ASD is now 1 in 36 children (Centers for Disease Control and Prevention [CDC], 2023). These communication and social interaction impairments challenge the child's school performance and the ability to develop and maintain relationships (American Psychological Association [APA], 2013). There are three tiers of ASD with level 1 needing support, level 2 needing substantial support, and level 3 needing very substantial support (APA, 2013). Thus, understanding the need for support and how the different levels reinforce the idea that "knowing a person with ASD, is knowing just one person with ASD."

Students diagnosed with ASD are impacted by sensory processing challenges and communication disorders. When the environment is uncomfortable, such as too busy or loud, the students can become overstimulated. If the student is overstimulated and cannot communicate effectively the combination of these challenges can lead to unexpected responses from the students. These obstacles significantly impact their ability to participate in oral hygiene activities (Erwin et al., 2022; Stein et al., 2013). Behavioral difficulties related to oral hygiene at home and in the dental office contribute to people with ASD having an increased risk of oral diseases (Bernath & Kanji, 2021; Du et al., 2019; Stein et al., 2013;). Hypersensitivity to oral hygiene tools such as toothbrushes, toothpaste, and floss can result in resistant behaviors (Stein et al., 2013) In addition, visual and auditory sensitivities can be provoked by bright lights or sudden sounds that can be found in a dental hygiene environment like a dental office or

bathroom (Erwin et al., 2022; Stein et al., 2013). Thus, oral diseases manifests, resulting in pain, self-injurious behaviors, missed school, and poor focus on learning tasks (Hoeft et al., 2015; United States Department of Health, 2021). In an article by Saeed and Shin (2013), it is stated that children with developmental disabilities can have a higher pain tolerance and have difficulty communicating that they are in pain. By the time the dental disease is found, it often requires extensive care and becomes a costly problem for the individual.

In preschools, oral health is considered a part of the daily routine for neurotypical children. However, children placed within special education classrooms, often are overlooked due to toothbrushing not being a part of special educations guidelines. Oral health training is encouraged in state-funded Head Start Preschool programs (National Maternal & Child Oral Health Resource Center, 2012). A gap in the literature related to oral hygiene programs in special education exists. However, there are a variety of studies that identify unmet oral health needs among children with special needs (Du et al., 2022; Lewis et al., 2005; Lewis et al., 2015). The special education classrooms offer regular daily hygiene routines including washing hands and toileting. The activity of toothbrushing can be added to the routine of regular hygiene activities. Implementing a toothbrushing program in the school setting provides an additional opportunity for toothbrushing (Du et al., 2022; Lewis et al., 2015). By providing a toothbrushing module to classroom teachers including a sensory, and communication friendly daily toothbrushing program, would it be possible to decrease behaviors around brushing teeth at home and in the dental office? This capstone seeks to address is the lack of oral health training in special education preschools.

Problem statement

Preschool students diagnosed with level 3 ASD have sensory sensitivities, rigidity, and communication challenges that impact tolerance of daily toothbrushing. The previously listed challenges lead to an increase in cavities and anesthetized procedures (Du et al., 2019; Sacramento County Oral Health Program, 2020). The use of anesthesia and/or emergency intervention adds to the cost of dental care (Freed et al., 2019; Logrieco et el., 2021). Preschool teachers that specialize in working with students with ASD can apply their expertise with visual supports, setting routines, sensory supports, and collaborate with Occupational Therapists to promote daily oral hygiene habits by engaging in the activity of daily living skill of toothbrushing in school. By including a toothbrushing routine in school an unmet health care need for children with health disparities will be partially met.

Purpose of the project

The purpose of this capstone project is to provide special education preschool teachers with an evidence-based toothbrushing module for students diagnosed with level 3 ASD. Providing a module that includes accommodations in early childhood education can support dental health and toothbrushing routines as the child ages (Stein et al., 2013). Occupational Therapists' skills in health promotion and our ability to modify the environment supports healthy habit formation (Epley et al., 2021; Surrow, et al. 2020). In addition, Cccupational Therapists possess the knowledge and expertise in the use of sensory processing and alternative communication strategies. This capstone project will utilize both sensory processing information and alternative communication strategies within the content of the teaching module to reinforce the needs of preschool students with level 3 ASD. In addition, this project will address an unmet health care need for marginalized preschool populations.

Research Questions

1. What do teachers perceive as their role in the oral hygiene of preschool students categorized as level 3 ASD following participation in a training module?
2. How does teacher confidence about use of adaptive sensory/communication strategies promote oral hygiene?

Theoretical Framework

Theoretical Foundation of Oral Hygiene Program Development

The learning theory that is most heavily relied on in the development of this capstone project was Cognitive Learning Theory. Cognitive Learning Theory is described by Braungart et al. (2020) as a highly internal process primarily directed by the individual. It involves perceiving the information and interpreting it using current knowledge. The use of this method helped empower the preschool teachers who attended the training module to use their past experience and build the new information onto the mastered knowledge.

The strength of Cognitive Learning Theory is its ability to take into consideration learners' levels of current understanding and information is presented at that level. Cognitive Learning Theory is primarily an intrinsic learning model that, according to Braungart et al. (2020) is driven by the learner's goals and expectations that create disequilibrium, imbalance, and tension to motivate learners. Giving the participants new information and the tools to make changes in student's health had the potential to motivate them to take on this new challenge.

Following the model of Cognitive Learning Theory was a valuable way to transition the information presented to the participants. These participants may not have been initially interested in implementing a new classroom program. Their resistance or insecurity is something

that was taken into consideration during the training. Braungart et al. (2020) tells us that educators must keep in mind that anxiety, life demands, and childhood experiences can interfere with learning. “A central tenet of the social constructivist approach is that ethnicity, social class, gender, family life, life history, self-concept, and the learning situation itself all influence an individual’s perceptions, thoughts, emotions, interpretations, and responses to information and experiences,” (Braungart et al., 2020, p. 90). The teacher’s busy schedules, student demands, other job, and personal pressures were acknowledged when attempting to embed toothbrushing into their classroom routine.

Although the Theory of Planned Behavior (TPB) is more commonly applied to behavior changes that impact an individual’s health (Tanguay et al., 2020), it can support people who are responsible for other people’s health. In this situation the teachers have the potential to impact preschool student’s short term and long-term health. Teachers have the power to influence their student’s health outcomes. U.S. Department of Health and Human Services (2005) reported that people might try harder to perform a behavior when they feel that they have a high degree of control over the behavior. In the case of implementing a toothbrushing program, the teacher has to feel that with the tools applied the students can participate in the activity and the teachers will feel successful implementing the program.

Incorporating Occupational Justice, in collaboration with Cognitive Learning Theory and TPB will reinforce the role of the Occupational Therapist in oral health. Occupational justice (OJ) distinguishes Occupational Therapy best practices by offering an integration of occupation, enabling, and justice. The integration of justice supports forms of occupational well-being, inclusion, differences in people, and contexts into consideration (Townsend & Wilcocks, 2004). Having CLT, TPB, and OJ together support the training module for teachers, keeping their

foundation of knowledge as an area to build on and how to support their understanding of their role in oral care. When the teachers that work with students diagnosed with level 3 ASD integrate toothbrushing into their classroom the foundation of occupational justice is practiced addressing this populations' health disparities. This project reflects the writings of Bailliard et al. (2020) who supports the idea that Occupational Therapists undertake intervention strategies that can alter social determinants to improve function and health.

Significance

The development of a teacher training module on the subject of toothbrushing in the classroom for students diagnosed with level 3 ASD can propel occupational science and Occupational Therapy forward. This program will address OJ by meeting the health and well-being of a population impacted by health disparities by eliminating barriers to allow students to participate fully in the routine of self-care. (American Occupational Therapy Association [AOTA] 2015; AOTA, 2021). Using a client-centered approach, providing evidence-based supports, and supporting routines will reduce barriers to the activity of daily living skill of toothbrushing for students diagnosed with level 3 ASD. In addition, sharing the information to a wide population of educators, administrators, and support staff puts Occupational Therapy into a leadership role. Creating a program that provides teachers with skills to impact health and independence over the lifespan of their students with level 3 ASD reflects "endorse the vision" orb of the AOTA's leadership development (AOTA, 2007; Moyers, 2011). The toothbrushing program will then move to challenge the process by enhancing the classroom routine, the action will be taken by supporting the teacher in implementing the program. Finally, with success on a micro level, we will build community and collective identity to create a foundation at the mesa level that will spread across the district and eventually to a macro change. Bailliard et al., (2020)

reinforces this process by reminding Occupational Therapists that effecting policy change will promote OJ.

This capstone project impacts the overall health and well-being of people diagnosed with level 3 ASD. These students regularly attend a structured school program where the staff can make an impact by supporting a routine of toothbrushing. Providing training and a practical toothbrushing program to the classroom staff encourages healthier teeth and gums. "Unfortunately, individuals who face the greatest barriers to care are often among the most vulnerable members of our society. The impact of unmet oral health care needs is magnified by the well-established connection between oral health and overall health" (Institute of Medicine and National Research Council, 2, p. 9). Giving students the opportunity to learn and participate in a daily toothbrushing routine reduces the development of caries and periodontal diseases (Attin & Hornecker, 2005; Du et al., 2022). Addressing the unmet dental care is needed to meet health and wellbeing of children and in turn improving school performance (Guarnizo-Herreño et al., 2019).

Operational Definitions

For the purpose of this capstone project, the following definitions were used.

Oral Hygiene: Maintenance of oral care through daily tooth brushing, use of fluoride toothpaste, flossing, and dental visits.

Autism Preschool Classroom: These specialized classrooms are run by master's degree special education teachers and include a 3:1 ratio adult to student design. The classroom is run with a variety of visual communication supports paired with verbal and or gestural cues. The environment provides little auditory, visual, tactile, distractions and uses evidence based sensory

supports. The curriculum provided is evidence based and designed to educate preschool students diagnosed with Autism.

Summary

Students diagnosed with level 3 ASD are more at risk for dental health issues (Bernath & Kanji, 2021; Du et al., 2019; Stein et al., 2013;). Resistance to changes in routine, sensory processing differences, and communication challenges impact this population's tolerance to oral hygiene activities, specifically brushing teeth. Poor dental health leads to pain that will impact school performance (Bloomenshine et al., 2008; Hoeft, et al.,2015).

Providing a training module that includes sensory and communication accommodations to preschool teachers of students with level 3 ASD supports oral health and the reduction of barriers to this activity of daily living (ADL). Occupational Therapists are well suited to support the activity of toothbrushing and general oral care. Occupational Therapists analyze the demands of an activity to understand body structures, functions, performance skills, and patterns to determine the demands of the activity (AOTA, 2014). A training module designed by an Occupational Therapist will support teachers with the integration of an oral hygiene routine. Once students have access to oral hygiene, their long-term health and participation in education will have an improved outcome (Du et al., 2018; Erwin et al., 2022; Guarnizo et al., 2019; Hoeft et al., 2015).

Using the CLT paired with the TPB supported the preschool teachers in feeling empowered to implement this program. Their awareness of the impact they can make on their student's oral health using a successful program will help to give this program traction.

A significant document developed by the Occupational Therapy profession for stakeholders' reference is the Vision 2025. This project defines goalposts in the areas of accessibility, collaboration, effectiveness, and leadership. This goalpost developed by Occupational Therapists for Occupational Therapists is titled Occupational Therapy's Vision 2025 (AOTA, 2017). Development of the toothbrushing program will support Occupational Therapy's Vision 2025 by addressing OJ for students with significant challenges with basic occupational functions. Occupational Therapists can provide intervention strategies that alter their client social determinants (Bailliard, et al., 2020). Putting this program in place and gathering support through interprofessional collaboration will demonstrate the leadership skills of the Occupational Therapy Profession.

Section II: Literature Review

The literature reviewed was focused on oral care for preschool students with ASD, barriers to oral care for people with ASD, and teaching modules for preschools related to oral hygiene. Evidence of poor oral health for preschoolers who have special needs is prominent in the literature. With the support of evidence-based studies, district special education preschools will mirror the training and modules that support the oral health of general education programs such as First Five and Head Start students. Barriers to oral care including sensory sensitivities, maladaptive behaviors, and challenges with communication are reported by people diagnosed with ASD and their caregivers (Bernath & Kanji, 2021; Logrieco et al., 2021; Prakash et al., 2021). Databases utilized to collect information on this subject included CINAHL, Nursing & Allied Health Premium, Psychology and Behavioral Sciences Collection, and Google Scholar. Search terms used were preschool, preschoolers, severe Autism, oral health, oral hygiene, toothbrushing, video modeling, and barriers.

Autism Spectrum Disorder

ASD is a developmental disability significant for impacting verbal and nonverbal communication used for social interaction. Characteristics of repetitive or stereotyped motor movements, manipulation of objects, and or speech are common in this diagnosis. In addition, children with ASD will have atypical responses to sensory experiences **(**APA, 2013; CALPADS primary disability codes, 2022). The Diagnostic and Statistical Manual (DSM) defines three different severity levels for ASD. Level 1 ASD requires support. If supports are not in place, social skill differences are noticeable. Restricted, repetitive behaviors are inflexible and cause significant challenges with functioning in one or more contexts. Transitions are difficult and executive functioning skills are impaired. Unusual responses to sensory stimuli are listed as an additional characteristic. The level of response is not found to be associated with the level of ASD. However, typical environmental sights, sounds, and touch can be interpreted as painful or intensive to the level of intolerance.

Level 2 will require substantial support. Social communication skills continue to be challenging even with support in place. The area of restricted, repetitive behaviors is marked by inflexibility and difficulty coping with change. Challenges with transitions are obvious to the casual observer and interfere with function. Sensory processing and organization of input can be impacted by rigidity and difficulty changing focus.

Level 3 requires very substantial support. Social communication is severely impacted by very limited initiation or non-typical attempts to initiate. Children diagnosed with level 3 have inflexibility of behavior and extreme challenges with change. Challenges with change can make sensory seeking or sensitivity seem more extreme (APA, 2013). The general characteristics associated with ASD significantly impact function, including activities of daily living skills.

When engaging students with level 3 ASD in daily oral hygiene, challenges in receptive communication, expressive communication, transitions, and unexpected responses to sensory experiences will impact success (Lewis et al., 2015; Taneja & Litt, 2020). Communication supports such as video modeling, core boards, and social stories are an example of accommodations that can support a routine and alleviate fear (Cirio et al., 2022; Isong et al., 2014).

Oral Hygiene

Oral hygiene is commonly an unmet medical need for children diagnosed with ASD (Bernath, 2021; Du et al., 2018; Erwin et al., 2022; Logrieco et al., 2021; Radovic et al., 2017). Oral hygiene includes brushing teeth thoroughly, using toothpaste, flossing, and having regular dental appointments. Barriers to dental care both at home and at the dentist office are impacted by challenging behaviors, sensory processing differences, and communication challenges (Du et al., 2018; Erwin et al., 2022; Lewis et al., 2015; Logrieco et al., 2021; Radovic et al., 2018; Stein et al., 2012). This is particularly evident in the ASD population due to sensory challenges and unexpected responses.

There is limited research found that discusses the barriers faced by children with moderate to severe ASD. Using the keywords Autism level 3, severe ASD, and oral health rendered zero results of journal articles. Studies that collected data through surveys or interviews were more likely to include all three levels of ASD but did not exclusively focus on children with level 3 ASD. A study by Lewis et al. (2015) examined the barriers to dental care using a qualitative approach. Parents were asked about home and professional dental care. The finding from this study included the need to consider individual characteristics and needs of children with moderate to severe ASD.

Parents report it is helpful to have a toothbrushing program incorporated into the child's school day (Lewis et al., 2015). Researchers have reported that parents have difficulty following through with a consistent dental hygiene program at home. Barriers that limit regular tooth brushing include daily life stressors, their child's health, and challenging behaviors. Challenging behaviors can include but are not limited to physical withdrawal, vocal outbursts, aggressive behaviors, tantrums and attempts to block stimulation. (Du et al., 2018; Stein et al., 2012; Taneja & Litt, 2020). Providing a regular specific approach as suggested by Logrieco et al. (2021) in a daily routine-based environment would allow students access to daily oral hygiene. The educational environment provided for students with the eligibility of ASD provides structure, routine, sensory, and communication supports that remove barriers to regular oral hygiene.

Barriers to Dental Care

Characteristics that contribute to the diagnosis of ASD include social communication impairments as well as restricted and repetitive behaviors (APA, 2013). In addition, Du et al. (2018) list anxiety and impaired communication as contributors to oral health challenges. These traits impact children's ability to participate in daily oral care at home and annual dental visits (Du et al., 2018; Erwin et al., 2022; Stein et al., 2013). Barriers to oral health for children with level 3 ASD include sensory processing, communication differences, and maladaptive behaviors.

Sensory Processing

Sensory Processing Disorder (SPD) includes dysfunction with modulating, organizing, and then using information from several sensory channels to regulate motor, behavioral, emotional, and attention responses. (May-Benson et al., 2009; Miller et al., 2007; Purpura et al., 2022). Children faced with the task of learning to brush their teeth can find the input of the toothbrush and toothpaste painful or too intense to organize. Children with ASD can have a

heightened sensitivity to tactile, gustatory, auditory, visual, and vestibular stimulation (Bernath & Kanji, 2021; Logrieco et al, 2021; Stein et al, 2013). The typical toothbrushing area is the bathroom where sounds of water running and the toilet flushing can be uncomfortable to those with auditory sensitivity. In addition, bright lights over a mirror can provide intensive visual stimulation. The combination of all these different inputs to be organized and modulated while also attempting to process verbal communication can lead to overstimulation and seemingly unpredictable behaviors.

Communication

Impairment in the social and cognitive functions in children diagnosed with ASD hinder their compliance with the simple daily task of toothbrushing (Du et al.,2022). When communication challenges are paired with cognitive impairment, children with ASD may not understand what is expected of them and/or are unable to express to caregivers which part of their mouth is painful. Frustration and lack of understanding can lead to more aggression that is treated in the dental office with sedation or rejection by the dental provider (Bernath & Kanji, 2021; Edwin et al, 2022; Lewis et al, 2015; Longrieco et al, 2021). The lack of cooperation with oral care at home due to impaired communication can lead to more serious oral health concerns (Bernath & Kanji, 2021; Du et al., 2019; Erwin et al., 2022; Lewis et al., 2015). Less frequent oral care at home contributes to children with ASD having emergency anesthetized care as their first dental visit (Du et al., 2022; Erwin et al., 2022**;** Isong et al., 2014). Once children have a negative experience at the dental office and consistent negative experiences with a toothbrushing routine at home, including regular restraint (Lewis et al., 2015), their anxiety and fear will impact their participation with oral hygiene care (Isong et al., 2014). The use of augmentative communication has been found effective in teaching children with ASD. Social

stories, visual icons, and video modeling are visual supports that can assist those with communication delays and help to relieve anxiety (Delano & Snell , 2006; Du et al., 2022; Gray & Garand, 1993).

Maladaptive behaviors

Unexpected responses to sensory stimulation during dental hygiene makes this daily activity challenging to impossible. Children with level 3 ASD are more prone to agitation, self-injury, and emotional dysregulation (Lewis et al., 2015). Uncooperative behaviors due to fear and anxiety can lead to dental interventions having to be completed under anesthesia and daily toothbrushing being done forcibly (Du et al., 2018; Lewis et al., 2015). Thus, implementing a daily toothbrushing program with accommodations may allow children to become more comfortable accessing oral health strategies.

Accommodations

Using the Human Activity Assistive Technology (HAAT) model, Occupational Therapists provide accommodations to support sensory, communication, and behavioral needs.

> The activity or need is identified first followed by the aspects of the human that affect the ability to perform and engage in the activity. The contextual influences that affect the human's performance of that activity is then considered. The AT design and recommendation come last, signifying technology's place to enable activity participation and engagement. (Cook & Polgar, 2014, p.41)

Examples of low-tech AT would include sensory supports such as sunglasses and noise reducing headphones in the dental home. Including these accommodations as well as other sensory strategies can help to create a sensory sensitive dental office (Como et al.,

2020). Thus, an Occupational Therapist, partnering with professionals in dental care, can bridge the gap of needed accommodations to support individuals with level 3 ASD.

Toothbrush Accommodations

Brushing teeth with a toothbrush twice a day works to support dental health (Du et al., 2021; Erwin et al., 2022; Zhou et al., 2019), but children with overactive sensory systems have difficulty using toothbrushes. Oral accommodations in relation to instruments used in the mouth should be considered when creating a toothbrushing program. Children with sensory sensitivities have a more difficult time tolerating toothpaste, toothbrushes, floss, and dental office cleaning equipment (Du et al., 2019; Stein et al., 2013). Lewis et al. (2015) reports providing alternative tools to improve the experience for the child will be different for each child. Accommodations that have been found to have success include vibrating toothbrushes, dipping toothbrushes in fluoride mouthwash instead of toothpaste, and gauze to wipe teeth (Du et al., 2019; Lewis et al.,2015; Zhou et al., 2019). A variety of different types of toothbrushes have been advertised as possible alternatives to the traditional toothbrush including a dual head toothbrush, chewable toothbrushes that can be consumed, and the u-shaped electric toothbrush. There is little evidence about the effectiveness of alternative toothbrushes versus a standard toothbrush.

Environmental Accommodations

When engaged in a challenging activity, the environment's sensory input can increase the anxiety and fear of the child with ASD (Du et al., 2019). The individual and combined input of visual, auditory, tactile, and vestibular processing differences can impact home and dental office care (Bernath & Kanji, 2021; Erwin et al., 2022; Stien et al., 2012; Stein et al., 2013; Villar et al., 2016). Occupational Therapists are trained to analyze the environment and suggest accommodations that take into consideration the child's needs or preferences. Environmental

accommodations will allow the child to regulate during the tooth-brushing routine (Stein et al., 2013). Adapting the environment can include providing sunglasses to the child or filtering the light in the bathroom or dental office. If children are sensitive to vestibular stimulation, a dental exam may take place without reclining the dental chair. To address auditory sensitivity, playing music over speakers or headphones can help distract the child from the sounds of the water, electric toothbrush, or dental equipment. To prepare the child with tactile sensitivity, the adult can provide tactile desensitization in and around the mouth prior to offering the toothbrush (Stein et al. 2013; Teneja & Litt, 2020).

Communication Accommodations

Communication and cognitive delays in children with level 3 ASD limit their ability to understand what is expected of them. They cannot verbally express they are in pain or are distressed by the situation (Bernath & Kanji, 2021; Erwin et al., 2022; Lewis et al., 2015). There is an emphasis on the importance of non-verbal communication methods for dental offices and family members when providing dental care. (Bernath & Kanji, 2021). Several studies support the use of non-verbal communication during toothbrushing. The most common assistive technology used to decrease fear and anxiety are social stories and video modeling (Collins & Schuster, 2001; Du et al., 2021; Du et al., 2018; Isong et al., 2024; Kouo, J. L. 2019; Yakubova & Chen, 2021). In addition, the use of simple or complex core boards can allow the child to express their basic needs by touching a core word represented by a symbol and word.

Toothbrushing Programs in School Settings

Children with level 3 ASD generally depend on parents, teachers, or caregivers for their oral health support. Families who are burdened with employment status, chronic disability, and daily stressors of raising a child with special needs may not have daily dental hygiene as top

priority (Bartolome et al, 2016; Bernath & Kanji, 2021; Logrieco et al, 2021; Stein et al, 2013). The foundational supports found in classrooms designed to support children with ASD include a predictable daily routine as well as sensory and communication accommodations. This controlled and structured environment is a place where children can feel safe and supported when engaging in toothbrushing. Having schools provide a structured toothbrushing routine gives the children an additional opportunity to practice toothbrushing away from home, where it can be a struggle. Parents report it is helpful to have toothbrushing incorporated into their school therapy programs to provide an additional toothbrushing activities and to participate in a comfortable environment (Edwin et al, 2022; Lewis et al, 2015). Having an embedded toothbrushing routine within an ASD classroom provides equitable opportunities and resources to engage in an unmet healthcare need.

Occupational Therapy and Oral Hygiene

Occupational Therapists are trained in the ability to evaluate performance skills. AOTA (2014) Occupational Practice Framework-4 describes performance skills as goal-directed actions that include motor, processing, and social skills. The activity of brushing teeth involves movement patterns, organization of sensory input, and communication with the caregiver. The effectiveness of Occupational Therapy oral care interventions has been found with the elderly (Bellomo et al, 2005, Gronbeck et al, 2017). A study by Bellomo et al. (2005) found that Occupational Therapy is particularly useful in improving oral hygiene in dependent and cognitively impaired long-term residents and may promote autonomy in the activities of daily living such as brushing. Occupational Therapist's skills in activity analysis and accommodations make this profession an important contributor to oral health for all ages and populations. However, no literature was found about the role of Occupational Therapists with children and

youth, particularly in the school system. Thus, a void exists regarding the role of school based Occupational Therapists and oral health.

Summary

Unmet oral hygiene care is a significant issue affecting children with ASD. The lack of oral hygiene studies that include children with level 3 ASD elevates the need for additional studies to include this population. Their different abilities with communication and sensory processing can lead them to use behaviors that are difficult for parents and dental professionals to understand. The behaviors developed by children to communicate are a barrier to accessing in-office dental care (Bernath & Kanji, 2021: Erwin et al., 2022; Lewis et al., 2015). Having a toolbox that includes alternatives to routine hygiene activities can support children in learning to engage in toothbrushing. The development of this skill will ultimately lead to improved health outcomes (Attin & Hornecker, 2005).

Providing a toothbrushing training module to professionals caring for children diagnosed with level 3 ASD will increase their confidence in providing daily toothbrushing within a school-based setting. Many of the children's uncooperative or resistant behaviors can be traced back to challenges in communication. "All behavior is a form of communication and a child's distress behavior is an indication that they are upset, that something is not right, or their needs are not being met," (Erwin et al., 2022, p. 1279). Will preparing the environment and activity with alternatives to oral hygiene tools, decreasing stimuli in the environment, preparing them for what is about to happen, and honoring the child's communication impact the frequency of uncooperative behavior? A void exists in the literature, thus reinforcing the purpose of this capstone project.

Section III Methodology

Project Design

A longitudinal survey using purposive sampling design was chosen for this capstone project. This design was chosen to answer questions about teachers of children with level 3 ASD confidence, knowledge, and willingness to provide a toothbrushing routine in the classroom setting. Having access to a full school district with a large ASD preschool program allowed the researcher to easily provide training to specific preschool teachers Institutional Review Board (IRB) approval was obtained prior to data collection (see Appendix A). A letter of support was provided by the site.

Setting

This capstone project took place in a northern California school district where the researcher is employed. The training of the teachers took place in a small conference room on the special education campus of the school district.

Participants

The fifteen teachers who took part in this training module had a continuum of experience ranging from one year to over twenty years teaching in a classroom. The participants all identified as female and held a master's degree in education. Each participant was a part-time or full-time employee of the San Juan School District. The preschool classes of the participants in this study include children from a variety of cultures and socioeconomic backgrounds. The United States Census Bureau (2021) reports the residents of include 13.4% of the population identify as Black or African American, 19% identify as Asian, 28.9% identify as Hispanic or Latino and 14.8% live below the poverty level. In addition, Sacramento is a safe destination for

Afghan refugees and currently 8000 refugees live in Sacramento (Redd, 2022). The preschool classes within the school district reflect the statistics of Sacramento County's make up. Accommodations have been taken into consideration to align with the culture and diversity of the participants and the children they teach. The World Federation of Occupational Therapists (WFOT; 2010) acknowledgement that every person is unique in the way they balance and integrate their culture, social, psychological, biological, financial, political, and spiritual elements in their own occupational performance and participation. These accommodations include how often children brush their teeth, importance of toothbrushing, types of toothbrushes, and when toothbrushing takes place at home.

Procedures

The researcher was invited as a district preschool professional development speaker. The training took place during a regularly scheduled teacher in-service day just before the first day of school for the district. There were 15 participants taking part in the training. After the 60-minute training, participants were asked to scan a quick response (QR) code that was linked to a 13-question pre-test electronic survey. The teachers had four weeks to implement the tooth brushing program and then they were asked to complete a post survey. The survey link was sent to their e-mails, and they were asked to complete the survey within 3-4 days. A reminder email was sent after four days. Access to their e-mails was available as district addresses are the first and last names of each employee.

The QR code to the post survey was blind copied to each participant with the assistance of another Occupational Therapy Practitioner that was not involved with the study to maintain anonymity. The pre- and post-survey included the same questions the first question is acknowledgement of participation, questions 2-10 were multiple choice and the last two were

open ended. The last question was placed for the participant to add their number identifier for anomalous comparison to the first survey.

Inclusion/ Exclusion

The inclusion criteria for this capstone project were as follows: participants working in a preschool classroom that includes children with level 3 ASD characteristics in the San Juan School District and spoke English. Exclusion criteria included people that do not work with preschool children with level 3 ASD and cannot read or speak English.

Instrument Development

A thirteen-item survey instrument was developed based upon a previously conducted needs assessment, the literature and content expertise and professional experiences of the researcher. Qualtrics, web-based software was used to create and distribute in an electronic format. This program allows the creation of a customized item design. Participants accessed the survey electronically using a QR code. A pilot test of the survey was done to determine the length of time it takes to complete, the consistency of data being questioned, and improve the wording of questions (Creswell & Creswell, 2018).

The survey consisted of 10 close-ended questions using a true or false nominal scale. This scale provided a frequency count of variables related to the implementation of the program. (Forsyth & Kviz, 2017). The first two questions provided information of classroom make up. The next four questions probed teachers' knowledge of oral health. The next three questions were designed to discover the teachers' knowledge of accommodations and their confidence in using those accommodations for the implementation of a tooth-brushing program. The last set of

questions were created to uncover the teachers' intention to continue with the tooth brushing module. A copy of the survey is located in Appendix B.

The module on oral hygiene, focusing on toothbrushing needs for the level 3 ASD preschoolers was developed based upon current literature, information from a needs assessment, conversations with preschool teachers, observations of students with significantly poor dental health and professional expertise. An outline of the module is located in Appendix C. A pilot review of the toothbrushing module was provided to content experts in the field including a teacher and school nurse. The purpose of piloting the training was to measure carryover, implementation of the module, which techniques are used most often, teachers preferred implementation time, length of the program, questions that come up, and best hygiene storage solutions.

At the completion of the pilot model modifications were made to the scheduling of the toothbrushing. Toothbrushing in a traditional preschool setting typically occurs after eating a meal at a sink with individual assistance. This was not effective in a classroom setting due to time and staffing limitations. It was found that implementing toothbrushing during a full class group activity eliminated a transition to the sink and was more time efficient. Toothbrushes labeled with the child's name was passed out to each child by an instructional assistant. Once the activity concluded the toothbrushes were collected and cleaned by the teacher or the instructional assistant.

Ethical Considerations

The University's process for Internal Review Board approval was completed. Participants were provided informed consent at the beginning of the survey with consent being accepted by

proceeding to the questions. An assessment of the risks and benefits of the capstone project was evaluated. The participants' risks were minimal, and the collected data was provided anonymously. In addition, follow-up of the module and reinforcement of the program will continue to be provided after the study is complete (Creswell & Creswell, 2018; Workman et al., 2017).

Timeline of Project Procedures

This capstone project evolved from clinical questions of the researcher. These questions were explored throughout the doctoral program, to build breadth and depth into evidence for the topic. Table 1 presents the major work for the capstone project.

Table 1

Capstone Timeline

October 2022	Begin drafts of Nature of project, literature review, and methods.
November 2022	Begin the IRB application
December 2022	Begin draft of survey questions, completed class 903
January 2023	Start class 882 – add theoretical components to refine capstone section 1
February 2023	Develop training module
March 2023	Complete class 882

April 2023	Start class 886 – add cultural and diversity concepts to capstone manuscript
May 2023	Submit IRB?
June 2023	Complete class 886 Start ALE Develop survey and pilot test
July 2023	Complete module, training power point, confirm survey questions
August 2023	Provide training/ module and present first survey
September 2023	Provide invitation for second survey
October 2023	Collect and analyze data
November 2023	Present capstone project
December 2023	Graduation

Section IV: Results and Discussion

Introduction

Survey participants were recruited using a purposive sampling design. Preschool teachers of students diagnosed with level 3 ASD participated in a scheduled district meeting prior to the

first day of the school year. The initial survey was distributed using a QR code immediately following delivery of the training module. Fifteen teachers attended the training, and 13 teachers completed the pre-survey. The survey did not include any additional responses after the initial training. After 4 weeks, a second survey was administered. The intent was to capture how teachers were using the information from the training. The post survey responses equaled a total of four completed surveys. Due to the low response rate the pre-test data was more heavily reported.

The number of students within each teacher's classroom diagnosed with level 3 ASD is represented in Figure 1. The participants in this study reported 66.67% of their students have level 3 ASD. Figure 2 shows that 75% of students in special education preschool do not brush their teeth at school.

Figure 1: Students with Level 3 ASD in the Classroom (Pre-survey)

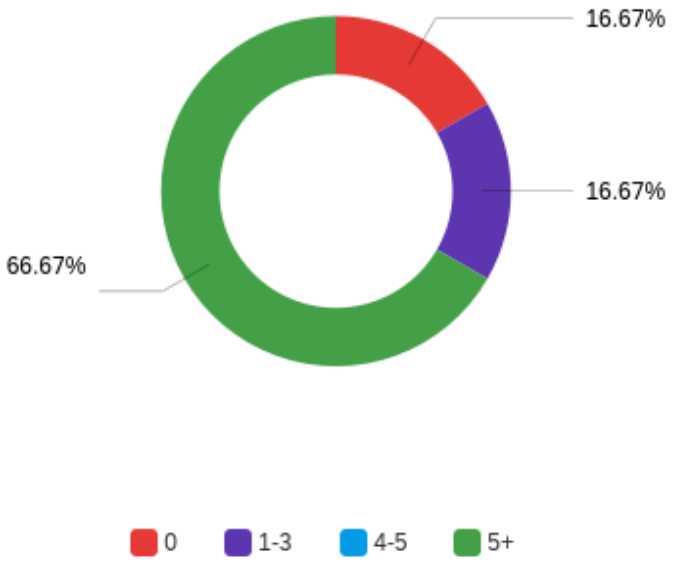
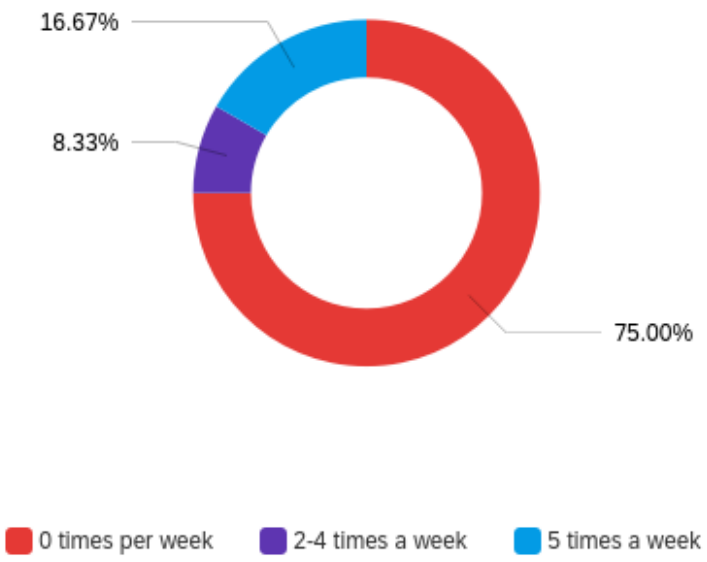


Figure 2: Toothbrushing Programs in the Classroom (pre-survey)



Results

Thirteen participants completed the pre-survey immediately following the training module. At the time of the pre-survey 12 out of 13 participants planned to integrate toothbrushing in their classroom programs. A post-survey was administered four weeks later. At the time of the post-survey only four returns were completed and of those all planned to integrate

toothbrushing into their classroom curriculum but at the time of the post survey, only one participant reported that they were integrating toothbrushing.

Role perception about oral hygiene

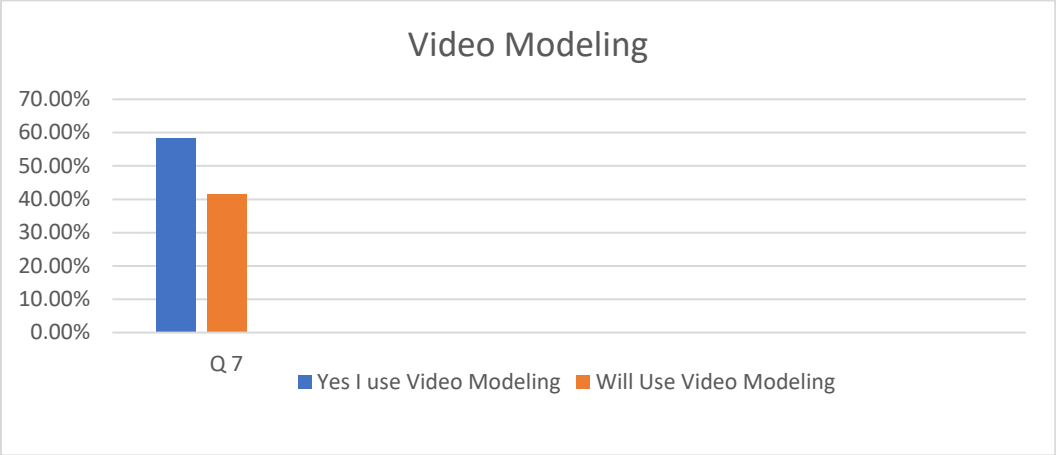
The pre-test data about participant perceptions regarding the importance of the need for a toothbrushing program yielded a positive result (100%). The majority of participants (88.33%) were aware that anesthetized dental procedures may contribute to school absences for students with level 3 ASD, with two participants (16.67%) who were unsure and one person did not answer this question. Participants in this study were asked if it was true that students need to brush their teeth one or two times a day. This question resulted in 100% true responses. Participants were asked how often they have the students brush their teeth. Three out of twelve respondents brush their student's teeth 2-5 times a week, one participant did not contribute to this data.

Although, the teachers in this study understand the importance and impact of oral hygiene, the data did not support teachers perceiving themselves as being a primary person that impacts their students' long-term health through toothbrushing.

Accommodations

There were three questions that addressed accommodations. From the data collected it was evident that the participants were confident using accommodations for the purpose of supporting sensory needs, communication differences, and learning supports such as video modeling. The percentage of participants using video modeling was 58.33% and those planning to use video modeling was 41.67% equaling 100% of the teachers willing to use this accommodation. Those currently using communication supports equaled 100% of the participants. (See Figure 3)

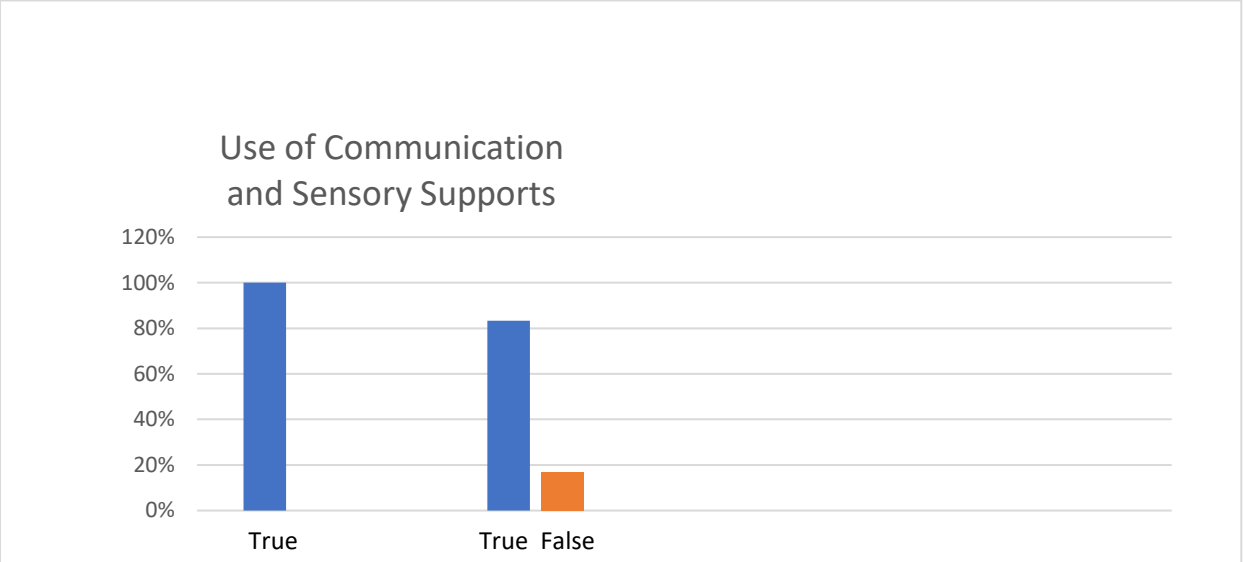
Figure 3: Teachers who use Video Modeling (Pre- survey)



Confidence in Toothbrushing

Teachers were asked about their confidence with using sensory supports to help their students brush their teeth. Figure 4 demonstrates that 83.3% reported they are comfortable using sensory supports to help their students brush their teeth 16.7% were not confident.

Figure 4: Teacher Confidence in the Use of Communication and Sensory Supports. (Pre- survey)



Barriers to implementation of a toothbrushing project

There were two open-ended questions that were used to probe barriers to integrating toothbrushing in their classroom schedule. Preschool teachers were asked if they plan to integrate toothbrushing into their classroom and which part of the day would they complete this activity. Of the thirteen participants, three did not provide an answer to this question, seven teachers reported they will integrate the activity during group activities such as snack or circle time. There were three teachers that reported they were unsure if they would be able to provide a toothbrushing program, one person said they were a first-year teacher and were unsure if she could add this activity to her schedule. The survey did not have any respondents give input to the last question which asked if they do not plan to integrate toothbrushing to please explain why.

At the pre-survey 91.67% of participants were interested in implementing an oral hygiene toothbrushing program. The post-survey resulted in four responses (31%) of all the participants. Of the four responses, one teacher implemented programing, and increased toothbrushing activities from 3 to 5 times a week. A second teacher also implemented the program and increased toothbrushing from 0 to 2-4 times a week. This second teacher reported that the program was discontinued once she felt the children were all comfortable brushing their teeth. The fourth respondent that said they would not be able to start toothbrushing secondary to staffing limitations. Figures 5 and 6 present this data.

Figure 5: Willingness to Incorporate Toothbrushing.

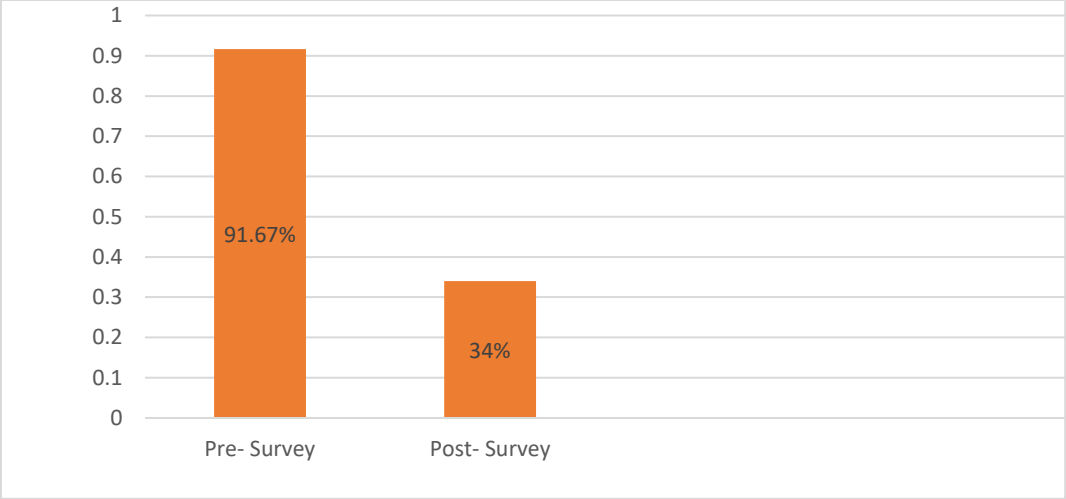
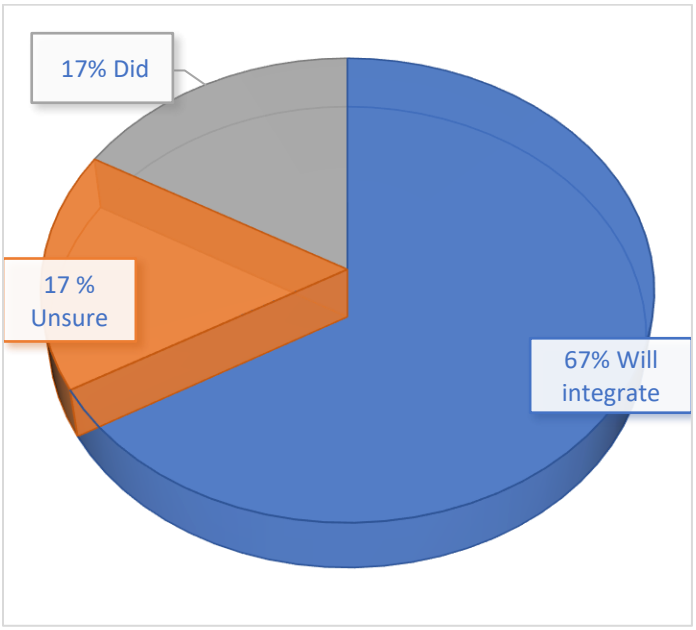


Figure 6: Integration of Toothbrushing in the Classroom Schedule (Pre-survey)



Discussion

This capstone project sought to discover if providing evidence-based information and strategies to preschool teachers of students with level 3 ASD will responsively expand their role to include toothbrushing into their classroom program. The major findings of this study included special education preschool teachers are motivated to support the oral health of their level 3 ASD students. Preschool teachers are confident and willing to use accommodations that will support their student's success. The study illustrates the design of the classrooms for students with ASD creates an optimal space to learn the ADL skill of toothbrushing. Further, by incorporating

toothbrushing within the classroom routine, occupational justice for students with level 3 ASD is reinforced. In addition to the children with level 3 ASD the classmates of these students are also engaged in toothbrushing. With all the students equally participating in a healthy habit.

The participants of this study were familiar and willing to use communication accommodations as recommended in similar studies (Due et al, 2022; Norma et al. 2001). The use of sensory accommodations or sensory adapted dental environment (SADE) used in this study were comparable to other studies of children with ASD (Cermack et al., 2015 Stein et al, 2012). The reason for this capstone study was to discover if given the information regarding the importance of oral hygiene for students with health disparities, specifically level 3 ASD, special education preschool teachers would begin a daily toothbrushing program. This study reinforces the dedication special education teachers have to their students in building habits to reinforce healthy hygiene routines. They are confident and willing to use their skills to teach a self-help skill that will have lifelong benefits. It is of concern that 75% of the teachers reported that toothbrushing is not a part of the daily classroom program in a public school setting. This finding is in direct contrast to preschool students that attend Head Start (U.S. Department of Health and Human Services, 2023). The result of the study highlights the special education preschool teacher's perception regarding their role in oral health and toothbrushing. A new question emerges and that is do teachers of students of level 3 ASD see toothbrushing as part of their role in the classroom setting?

Role perceptions

The purpose of the training module was to provide teachers with additional knowledge that can be built upon the knowledge they already possess (Braugart et al. 2020). In this capstone, the preschool teachers with students that have been diagnosed with level 3 ASD know

how to provide evidence-based supports. An Occupational Therapist can provide the participants with additional tools in the areas of sensory accommodations, communication, and assistive technology information to support evolution of their role perception. The additional knowledge of specific supports including toothbrushing videos, oral hygiene social stories, different toothbrush styles, and environmental accommodations adds to their mastered foundation skills (Braugart et al. 2020). With this additional knowledge, they are expected to be more confident in adding a new activity to their classroom routine. In addition to the accommodations presented in the training module the teachers are informed of their impact on their students' long-term health. The Theory of Planned Behavior (TPB) was put in place to create a motivation to provide oral care to their students. The pre-test results of this capstone reflected that teachers were motivated and confident in providing a successful toothbrushing program in their classroom. The low post-survey response did not demonstrate continued motivation.

Accommodations

The use of accommodations as well as the implementation of the toothbrushing program supports the theory of Occupational Justice. The participants in this study teach classrooms that reflect the cultural richness of Sacramento. Providing supports that are shown to address populations with health disparities strongly integrates the Occupational Justice theory. Not only are the students diagnosed with level 3 ASD, but they also come from ethnically diverse and socioeconomic disadvantaged families. Thus, social determinant of health impact this population. It is imperative to take into consideration cultural elements of every person as they participate in their own occupational performance (WFOT, 2010). The specific accommodations support the needs of the students with sensory sensitivities and anxiety (Braveman, 2014). The implementation of the toothbrushing program gives the children an additional opportunity to

participate in a health care need that can be challenging to meet at home consistently. Having this classroom routine available impacts the preschool populations long-term health and can impact their future participation in school and attendance.

Confidence

The implementation of this program demonstrated that teachers possess the confidence to provide a toothbrushing program. The results of the study suggest that teachers want to support equity to students with health disparities by providing toothbrushing but have systemic challenges such as scheduling demands and low staff-to-student ratios. They understand that they can make an impact on their students' long-term health by implementing this program, building habits within classroom routines. This training module, based upon Cognitive Learning Theory provided information on how to support toothbrushing in the classroom, while incorporating pervious foundational knowledge about level 3 ASD (Bradshaw, et al., 2023; Braungart, et al., 2020). Teachers were open to incorporating the new information immediately following the in-service training. The overall results of the survey demonstrate their confidence in using evidence-based supports in their classroom settings. The lack of post results was surprising as 91.67% of respondents were going to plan to make brushing teeth part of the classroom routine. The follow through implementing the program was challenging as revealed by the post-survey and lack of responses. Based upon CLT, the stressors of the teachers' classroom responsibilities and personal obligations may have impacted their ability to put into practice the new information. New questions emerge related to timing of professional development: if a preschool teacher training module is provided a few months into the school year after a routine is established would it be easier to implement a new program? Does the school context support the

integration of new routines in the preschool classroom setting? And when is the best time to introduce new classroom routines for success in implementation?

Occupational Justice

The results of this capstone project support the premise of occupational justice for students with level 3 ASD. Occupational justice encourages the interrelationship of structural and contextual elements, which in this capstone project are the classroom setting, and the knowledge of oral health issues for students with level 3 ASD. By training the preschool teachers, it was hoped that an unmet health need could be provided for children with health disparities. Through participation in the training module, preschool teachers would feel empowered and inspired to provide a toothbrushing routine that can improve health and educational outcomes. The implementation of this program is one way a large system can impact a child's social determinants of health that a marginalized population struggles to meet. The module training to incorporate a daily routine for the teachers and the students reflects performance patterns that support inclusive participation in everyday occupations regardless of individual education program eligibility or socioeconomic levels (AOTA, 2020)

Strengths and Limitations

Strengths of this study include the strong rapport the research Occupational Therapist has with several of the preschool teachers. Trust and familiarity with the researcher were assets and supported their willingness to participate and follow through with the study. The survey used for the pre-test and post-test was piloted by professionals within the school district. This was done to address any wording confusions as well as relevancy of questions to the study. In addition, the researcher has over twenty-five years of experience working with pediatric clients diagnosed with ASD.

Limitations of this study included the lack of follow through by the support staff. It is possible that poor staffing or instructional assistants that do not support an additional task in the classroom impacted the consistency of toothbrushing. In addition, students inconsistent or changing attendance can impact the success of the program's routine. The timing of the training could also be a factor with implementation. The training was given the first day back from summer vacation and teachers were still transitioning from vacation regulation to work regulation. Also, in the final survey, the question of the total number of students in the classroom was not asked. This question would have been helpful to better understand staffing concerns and/or reasons for not incorporating the program daily. The small sample size of participants involved with this study will impact the generalization of this studies results. Finally

the small number of post-survey results do not support strong validity of the study.

Implications for Occupational Therapy

Occupational Therapists advocate directly or indirectly to ensure that occupational needs are met by their clients. Having an understanding and implementing supports that address patterns of performance for individuals within different contexts is within the domain of the Occupational Therapy profession (AOTA, 2020). The practitioner's ability to evaluate the needs of an individual and a group within context of an environment of a dental office opens up the possibility of Occupational Therapy providing training and consultation with dental offices and providers that serve populations with health disparities. Interprofessional collaboration supports effective delivery as professions complement each other when developing an oral health program in environments including dental offices or classrooms (Salfi, 2021; Sanders et al., 2021). Occupational Therapists providing oral health education is supported by the Occupational Therapy domain and process described in the Occupational Therapy Practice Framework

(AOTA, 2020). By providing oral health interventions as part of Occupational Therapy practice, the Healthy People 2030 goal of increasing access to oral healthcare including preventative services is addressed (Office of Disease Prevention and Health Promotion [ODPHP], n.d.).

Future Research

Additional research that would probe the preschool teachers' reasons for limiting their participation in daily toothbrushing is needed. Further research would include a longitudinal study of students with level 3 ASD that have participated in a toothbrushing program and the frequency of requiring anesthetized dental care in their later elementary or teen years compared with students who did not have daily toothbrushing at school. A deeper look into the classroom curriculum may reveal the best time to embed a toothbrushing into the preschool day. This information would be added to the training module to support teachers in implementing toothbrushing into their day. In addition, the parents' perception of the long-term impact of oral hygiene would be an important area to explore. As the children are participating in the classroom toothbrushing program, are the parents able to implement toothbrushing more easily at home? Once the families are implementing a successful toothbrushing program at home would the parents and child be more open to educating their dentist in specific accommodations that support participation in the dental home?

Summary

The purpose of this capstone project was to develop a toothbrushing program in special education preschool programs as a part of the daily classroom activities. The implementation of a toothbrushing routine would meet a health care need that is a significant concern for children with health disparities (Du et al., 2019; Erwin et al., 2022; Lewis et al., n.d.; Radovic et al.,

2018). The foundational supports for students with level 3 ASD are solidly in place making this environment ideal to implement toothbrushing. The implementation of a scheduled routine activity is most importantly initiated by the classroom teachers. A training module was provided with the goal of inspiring the teachers to use their skills to impact their students' lifelong health. The data suggested that teachers are willing and confident in providing a toothbrushing program with accommodations including sensory supports, but do not perceive this intervention as part of their role. This program has the potential to be embedded within the special education preschool classrooms routines. Direct support and encouragement from other teachers that have been successful, as well as nursing, OT, and administrators will allow the classrooms to continue to implement this healthy habit. In addition to school personnel, the families of the students will recognize and acknowledge the difference the intervention will have on their home routine and the child's long-term health.

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Appendices

APPENDIX A: IRB Approval

Hello cheryl domino,

Congratulations! Using a limited review process, the Institutional Review Board at Eastern Kentucky University (FWA00003332) has approved your request for an exemption determination for your study entitled, "Oral health training for special education preschool teachers" This status is effective immediately and is valid for a period of three years as long as no changes are made to the study as outlined in your limited review application. If your study will continue beyond three years, you are required to reapply for exemption and receive approval from the IRB prior to continuing the study.

As the principal investigator for this study, it is your responsibility to ensure that all investigators and staff associated with this study meet the training requirements for conducting research involving human subjects and comply with applicable University policies and state and federal regulations. Please read through the remainder of this notification for specific details on these requirements.

Adverse Events: Any adverse or unexpected events that occur in conjunction with this study should reported to the IRB immediately and must be reported within ten calendar days of the occurrence.

Changes to Approved Research Protocol: If changes to the approved research protocol become necessary, a Protocol Revision Request must be submitted for IRB review, and approval must be granted prior to the implementation of changes. If the proposed changes result in a change in your project's exempt status, you will be required to submit an application for expedited or full review and receive approval from the IRB prior to implementing changes to the study. Changes include, but are not limited to, those involving study personnel, subjects, recruitment materials and procedures, and data collection instruments and procedures.

Registration at ClinicalTrials.gov: If your study is classified as a clinical trial, you may be required by the terms of an externally-sponsored award to register it at ClinicalTrials.gov. In addition, some medical journals require registration as a condition for publication. In the case of journals with membership in the International Committee of Medical Journal Editors, clinical trials must be registered prior to enrolling subjects. It is important that investigators understand the requirements for specific journals in which they intend to publish. In the case of sponsored project awards, timeline requirements will vary for awards that require registration. Approved consent forms must be uploaded in the system for all Federally-funded clinical trials after subject enrollment has closed, but earlier registration is not required for all agencies. If you have questions about whether a sponsored project award requires registration and on what timeline, please send an email to tiffany.hamblin@eku.edu before beginning recruitment so that the specific terms of the award can be reviewed. If you have a need to register your study and do not have an account in the system, please send an email to lisa.royalty@eku.edu and request to have a user account created.

If you have questions about this approval or reporting requirements, contact the IRB administrator at lisa.royalty@eku.edu or 859-622-3636.

Appendix B: Survey

Content validity was established by the literature review and a panel of experts. Pilot testing was done to improve question design and determine the time to complete survey.

1. Acknowledgement of participation in study.
2. I currently have __ students with level 3 (severe) ASD on my class list.

   0-5
3. My students brush their teeth as part of their classroom curriculum. Likert Scale
4. Brushing teeth 1-2 times a day can make a difference in overall oral health. T/F
5. Anesthetized dental procedures will cause students to miss school. T/F/ Unsure
6. Dental hygiene can impact school attendance, behavior, and long-term health. Likert Scale
7. I can use video modeling to support tooth brushing. Likert
8. I am or will make brushing teeth part of my classroom routine. T/F
9. I am or will use adaptive communication to support my students with level 3 ASD when they brush their teeth.T/F
10. I feel comfortable using sensory supports to help my students brush their teeth. T/F
11. If you are going to add toothbrushing to your class program which part of the day will toothbrushing happen? Open question
12. If you do not plan to add toothbrushing to your classroom program, please explain why. Open question
13. Please enter your identifier in the box below.

Appendix C: Agenda of Training Module and References

- Introduction: 5 minutes
- Learning Goals reviewed: 3 minutes
- Importance of daily dental hygiene: 10 minutes
- Barriers to oral care in children with Autism: 10 minutes
- Video simulation activity followed by group discussion: 20 minutes
- Barriers to toothbrushing multiple choice virtual game: 10 minutes
- Partner interactive learning activity: 15 minutes
- Review of the program including sensory, and communication supports: 20 minutes
- Participants will write out the class schedule and decide where the program will fit: 10 minutes
- Discussion of local offices that specialize in working with children with special needs: 15 minutes
- Wrap up and questions: 10 minutes

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