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Providing Oral Health Education to Underserved Children and Families within an Interdisciplinary Team

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Interdisciplinary Team**

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Chapter 1: Introduction

Oral health is an important aspect of overall health and is linked to school performance and life-long health and wellness outcomes (Griffin et al., 2016; Jackson et al., 2011; Mahat & Bowen, 2017; Meyer & Enax, 2018). Early childhood caries (ECC) are a chronic disease of childhood and many children are a high risk for ECC due to environmental factors, many of which are beyond their control (Braun & Cusick, 2016; Gold & Tomar, 2018; Kumar et al., 2014; Meyer & Enax, 2018). Innovative strategies such as community-based oral health programming, oral health programming in education settings, and child and family education and game-based initiatives have been found to impact overall oral health outcomes (Albino & Tiwari, 2016; Aljafari, et al., 2017; Angelopoulou et al, 2016; de Jong-Lenters, et al., 2019; Gold & Tomar, 2018; Haleem et al., 2016; Huebner & Milgrom, 2015; Kumar, et al., 2015; Spencer, et al., 2018). In addition, the role of the interprofessional team on oral health and wellness has been found. To date, occupational therapy providers have not been part of the interprofessional oral health team unlike other professions such as physicians, nurses, physician assistants, nurse practitioners, and dieticians (Abou El Fadl et al., 2016; Biordi et al., 2015; Braun & Cusick, 2016).

The remainder of this portfolio outlines the background literature, needs assessment process, and project activities of a master's project focused on oral health outcomes through use of an interprofessional team. The project activities were based on recommendations from current literatures included interprofessional education and teaming as well as family-centered education to promote positive oral health outcomes

for young children and their families. Recommendations for future collaborations and the occupational therapy role within interprofessional oral health care teams are shared.

Chapter 2: Literature Review

Oral health greatly impacts overall health and well-being, however oral health services and education are disconnected from other health services at this time. Early childhood caries (ECC), commonly known as dental cavities, is the most common chronic disease of children in the United States (Martin et al., 2018; Meyer and Enax, 2018). Fortunately, ECC are also 100% preventable through daily oral hygiene, regular oral screening and cleaning services, and health education initiatives (Davis & Plasphl, 2017). While preventable, current incidence and prevalence data show there is still a lot unknown about the best means of preventing the disease and minimizing the short- and long-term impacts ECC have on health and well-being (Albino & Tiwari, 2016). Some of the health impacts of ECC are pain, school absenteeism (and workplace absences for parents), concentration issues, obesity, cardiac and respiratory issues, diabetes, and adult oral health diseases (Abou El Fadel et al., 2016; Mahat & Bowen, 2017). This abbreviated review will discuss the impact of oral health on overall health, current programs focused on oral health prevention and promotion, and the roles of the interprofessional team in oral health and wellness. More detailed reviews of the literature are included in Appendix A: Individual Literature Reviews.

Impact of Oral Health on Overall Health

While oral health issues are a concern in and of themselves, oral health also has many impacts on overall health and occupational performance and participation through many aspects of daily life. Some of these concerns include links to other health conditions and co-morbidities, academic and educational participation, short- and long-term quality of life issues, and long-term health knowledge and implementation.

It has been found that those who have access to oral health services often have better overall health outcomes (Davis & Plaspohl, 2017). Oral health access to services also contributes to oral health promotion and prevention behaviors and this can also support prevention of other health issues (Davis & Plaspohl, 2017). Several illnesses are linked to poor oral health in addition to the common diseases we may think of (i.e. dental caries, periodontal disease, and oral pain) and include diabetes, heart disease, stroke, low-birth weight babies, and increased overall infection risk (Davis & Plaspohl, 2017; Jackson et al., 2011). In addition, to the health issues, dental caries in childhood have been associated with school absenteeism, difficulty with school participation including concentration issues and difficulty speaking, eating difficulties, self-esteem issues related to appearance, and poor lifelong oral health behaviors and outcomes (Griffin et al., 2016; Jackson et al., 2011; Mahat & Bowen, 2017; Meyer & Enax, 2018). In regards to school, children with unmet dental needs have been shown to perform more poorly in school based on academic standards (i.e. grades) than those whose dental needs are met (Griffin et al., 2016; Jackson et al., 2011; Seirawan et al., 2012). Poor child oral health also impacts the entire family. Parents miss work because of school absenteeism and for those with access to dental care, they miss work to take children to dental appointments for fillings, caps, or tooth extraction; these appointments are significantly longer in length than preventive dental appointments (Griffin et al., 2016; Meyer & Enax, 2018; Seirawan et al., 2012). In addition, dental problems have been linked to childhood hospitalization again impacting family routines and finances (Meyer & Enax, 2018).

Current Interventions Strategies to Promote Oral Health

Current evidence indicates the health promotion and prevention is a key mechanism for promoting oral health and decreasing dental caries and other oral health diseases in children (Gold & Tomar, 2018; Griffin et al., 2016; Meyer & Enax, 2018). This includes basic daily oral hygiene, dental care including regular cleaning, fluoride treatments, and sealants for permanent molars, and lifestyle changes related to sugary foods and fluoride intake through water (Griffin et al., 2016; Meyer & Enax, 2018). While prevention and health promotion are key, there are many factors heavily linked to the social determinants of health, such as socioeconomic status, parental knowledge and education, access to routine care, family structure, and home environment routines and characteristics impact a child's risk for developing ECC (Braun & Cusick, 2016; Gold & Tomar, 2018; Kumar et al., 2014; Meyer & Enax, 2018). Recently, several different types of approaches to addressing oral health promotion outside the traditional dental clinic have been piloted.

A review of recent literature on behavioral interventions focused on oral health found four main categories of oral health interventions: school-based, family-based, community-based, and ongoing clinical trials that included behavioral interventions (Albino & Tiwari, 2016). Many recent studies focused on the use of conventional education, fluoride varnish, health education, motivational interviewing, and/or oral health education as behavioral methods to impact outcomes related to severe early childhood caries (Albino & Tiwari, 2016). Similarly, Nakre and Harikiran (2013) conducted a systematic review and found that oral health education for children between 6 months and 6 years of age, regardless of the delivery or type of education,

was effective in improving oral health knowledge and behaviors in children but should include caregivers in the education for cumulative benefits.

School-based programs have utilized traditional education as well as oral health education in addition to oral cleaning, screening, fluoride varnish, and referral interventions (Angelopoulou et al, 2016; Haleem et al., 2016). Angelopoulou et al. (2015) examined changes in oral health knowledge, oral health behavior, oral health attitude, and oral hygiene in comparing two groups of children at baseline, 6 months, and 18 months after receiving oral health education. One group of children received education through experiential learning while the other received it through traditional lecturing in school-based programs and found improvements in all areas for both groups with significantly better oral hygiene at the 6-month follow-up (Angelopoulou et al, 2015). Haleem et al. (2016) similarly found improvement in oral health knowledge after education in a randomized controlled trial of 935 adolescents, but found that repetition and reinforcement of education were a key factor in sustained behavior change as compared to a one-time education session. Finally, game-based teaching methods have been found to be effective for improving oral hygiene in children (Aljafari, et al., 2017; Kumar, et al., 2015).

Similar to school-based initiatives, there have been community-based oral health initiatives aimed to improve oral health outcomes for children that use motivational interviewing, fluoride treatments, and/or oral health education. Gold and Tomar (2018) conducted a program evaluation of oral health services provided through the woman, infants, and children (WIC) oral health program. Dental professionals provided motivational interviewing, oral health education focused on oral hygiene habits, fluoride

use, and nutrition, and fluoride varnish treatments during visits to the WIC office for appointments (Gold & Tomar, 2018). For many individuals, dental services through WIC was the first time that access to services was available for children and data showed that incorporation of dental programming into WIC services can improve oral health outcomes (Gold & Tomar, 2018). Huebner and Milgrom (2015) conducted a community-based participatory action research approach to provide four 90-minute small group education, instruction, and peer problem solving sessions aimed to increase or maintain twice daily brushing. The study found that increases in parent attitudes and knowledge related to the importance of brushing and oral health in general (Huebner & Milgrom, 2015).

Regardless of the type of program, community or school based, there is evidence of the importance of parent or caregiver involvement in the oral health education program (Albino & Tiwari, 2016; de Jong-Lenters, et al., 2019; Huebner & Milgrom, 2015; Spencer, et al., 2018). In a qualitative study examining the role that parents play in school, many barriers were discovered and findings suggest the value of school health partnerships with parents and caregivers to support and complement the school education into the home setting to improve health outcomes (Spencer et al., 2018). Parents and caregivers may have the knowledge to implement appropriate oral hygiene practices in the home, however implementation of those behaviors is inconsistent (de Jong-Lenters et al., 2019). Commonly cited barriers to implementation of oral hygiene practices include challenging behaviors from the child, parent/child/familial stress, and poor management or execution of family routines (de Jong-Lenters et al., 2019). To attempt to address these barriers, de Jong-Lenters et al. (2019) presented a proposed

study protocol to examine caregiver and parenting strategies as compared to current dental care practices; they proposed that 3 intervention sessions with caregivers and providers focused on addressing barriers to oral hygiene implementation in the home could potentially improve tooth brushing behaviors and support dental caries prevention.

The Interprofessional Oral Health Team and Occupational Therapy's Role

Due to a variety of constraints in how services were provided in the community based and school-based programs and access issues, use of an interdisciplinary approach to intervention including the use of non-dental health professionals as part of the team has been recommended (Gold and Tomar, 2018; Nakre & Harikiran, 2013). This work can start as early as in the classroom when training new healthcare professionals. One such program was piloted at New York University through use of an interprofessional collaborative curriculum for dentistry and graduate nursing programs (Hallas et al., 2015). Working with students early on the curriculum in a collaborative manner on common competencies related to oral health can be an effective method for supporting long term patient outcomes (Hallas et al., 2015). Another program, while not interdisciplinary in nature, focused on the importance of dental education programs including cultural competency into their curriculum in order to ensure best practices at addressing the oral health disparities among racial and ethnic minority populations (Behar-Horenstein et al., 2017). Several strategies were used in the curriculum re-design to support increased cultural awareness and implementation of new culturally responsive strategies, with one recommendation for a greater focus in dental programs on application of public health dentistry and community-based prevention programs

which lend well to interprofessional learning and engagement (Behar-Horenstein et al., 2017).

In the clinical practice setting, studies have examined the role of nurses, midwives, nurse practitioners, dieticians, medical doctors, and physician assistants in the oral health team to increase oral health outcomes for children (Abou El Fadl et al., 2016; Biordi et al., 2015; Braun & Cusick, 2016). Some approaches are coordinated care approaches in which a primary care provider conducts an oral screen and provides fluoride varnish and then provides a referral to a dentist; whereas others are co-located or integrated services in which dental providers are co-located with medical providers in the same clinic or services are provided collaboratively through a medical home, telehealth, or community-based model (Biordi et al., 2015; Braun & Cusick, 2016). (Abou El Fadl et al. (2016) conducted a systematic review of the literature related to outcomes of incorporating nurses and midwives into oral health promotion for young children and their families. Within their review, the incorporation of oral health promotion into nursing practice showed overall positive outcomes including the reduction of ECC (Abou El Fadl et al., 2016). Another team which included nurse practitioners and dieticians provided oral health screening, fluoride varnish, and dentist referrals to pre-school age children from low income backgrounds across a multi-visit approach and found decreases in dental caries and increased use of dental clinic services through their approach (Biordi et al., 2015). With all of these approaches, increased oral health has been found.

Occupational therapy practitioners' scope of practice includes not only oral hygiene, but also supporting individuals in building positive habits and routines to

promote health and wellness (AOTA, 2020a). Thus, occupational therapy practitioners could make a good fit within the oral health team. However, to date, the role of occupational therapy within an integrated oral health care team approach has not been explored. Occupational therapy's role within primary care is expanding and includes health prevention and wellness promotion (Bolt et al., 2019; Halle et al., 2018; Jordan, 2019). While dental services are situated outside the rest of medical services and have separate reimbursement models, dental care is part of the broader definition of primary health care which includes a focus on preventive and behavioral approaches to health (AOTA, 2020b). Working with dental teams and other medical professionals around oral health and wellness is an opportunity aligned with the profession of occupational therapy.

Chapter 3: Needs Assessment

Various activities were completed to inform our project with our community partner RSS. By collaboration and communication between St. Catherine OT students and RSS employees and volunteers these activities were accomplished. This chapter gives detail regarding our community partner RSS, identifies an environmental scan of neighborhoods and schools the project takes place in, and discusses meetings which occurred throughout the project with RSS.

The collaboration for this project was developed by an OT faculty member and leaders from RSS to address areas RSS identified as areas for growth. This included 1) educational modules for non-licensed health care professionals to increase the oral health workforce and support positive oral health outcomes from at risk children and 2) expand the services provided to early childhood programs to include more community program partners and provide family education alongside the classroom education.

Description of Community Partner: RSS

The mission of RSS is “through education and preventive services, RSS prepares and empowers all children in our community to care for their oral health” (RSS, 2020, para # 1). The purpose of RSS is to provide each child the opportunity to be free from dental disease within the community (RSS, 2020). RSS serves a population of pre-school and school-aged children and their families which derive from diverse socioeconomic and cultural backgrounds.

RSS has a wide variety of professionals that make up their team. These professionals include an executive director, marketing and developmental manager,

community health workers, and dental professionals (i.e. advanced dental therapist, dental assistant, and volunteer dentists) (RSS, 2020).

RSS partners with 14 Minneapolis public and charter schools and 12 Minneapolis early childhood programs (RSS, 2020). The services that RSS provides to these students include on-site dental services, oral health classroom education, referral services, and after school events (RSS, 2020). When the stay at home order was implemented due to COVID-19, RSS's services were temporarily discontinued. Since the stay-at-home order has been lifted, RSS's team has resumed limited on-site dental services and created educational videos to send to parents in lieu of standard in-person events.

School Sites and Neighborhoods

In alignment with its mission, RSS targeted schools and neighborhoods with diverse racial and socioeconomic needs. Minnesota Compass, a continuously updated resource on social indicators for Minnesotan communities, was used to research surrounding neighborhoods of the schools targeted as expanded partners for this project and reflects 2014-2018 data (Minnesota Compass, 2020). Due to the covid-19 pandemic and related economic recession, the current state of social determinants of health are unknown.

The RSS team worked directly with the following communities to promote public health and developed informed approaches and strategies to best serve Minnesota families. This background knowledge strengthened the collaboration forged with St. Catherine University OT students over the course of in person and electronic meetings as the project developed and was implemented in the community. See Appendix B:

Needs Assessment for the template used by OT students to gather information about each school and neighborhood served by the project.

Legacy of Dr. Josie R. Johnson Montessori School

Referred to as JJ Legacy School (JJLS) and formerly known as Bright Water, JJLS is a tuition-based Pre-K and free K-6th grade public charter school located in North Minneapolis (JJLS, 2020). The preschool was founded in 2004 and expanded to serve K-6th in 2007 (JJLS, 2020). The North Minneapolis location is a strategic decision to expand Montessori school options to children living in urban areas, and reflects its mission “to provide an excellent, equitable Montessori education to an intentionally diverse student body” (JJLS, 2020).

Lind-Bohanon Neighborhood. JJLS is located in the Lind-Bohanon neighborhood of Ward 4 in North Minneapolis (Minneapolis Department of Community Planning and Economic Development [MDCPED], 2015). Lind-Bohanon is a multi-cultural neighborhood of approximately 5,447 residents, 42.7% non-Hispanic white and 57.3% non-white as of 2014-2018 (Minnesota Compass, 2020). Of the approximate 3,120 non-white residents, 28% identify as Black, 13.1% Asian or Pacific Islander, 6.6% Hispanic/Latino, and 14.8% as two or more races (Minnesota Compass, 2020). The Lind-Bohanon neighborhood is home to a prevalent foreign-born population (12.7%) reflected in the number of multilingual residents (20.9%) and residents who report they speak English less than “very well” (Minnesota Compass, 2020). The Lind-Bohanon neighborhood comprises almost one-third of families with children under 18 years old with a lower rate of single-parent homes than the state and national average (Minnesota Compass, 2020). More than one-quarter of Lind-Bohanon’s residents are 17 years old

or younger, with 7.4% ages 5-9 years old and 10.4% under 5 years of age (County Health Rankings & Roadmaps, 2020; Minnesota Compass, 2020).

Prior to the covid-19 pandemic, 67.1% of working age adults reported being employed, 9.4% unemployed, and 23.7% living with a disability (Minnesota Compass, 2020). Eighty-eight percent have a high school degree or higher and 14.8% have a bachelor's degree or higher while 12% have attained less than high school (Minnesota Compass, 2020). The majority of households (61.4%) make less than \$50,000 a year with a median income of \$41,691 (Minnesota Compass, 2020). However, the largest percentage of residents make below \$35,000 a year and 27.1% of residents live below the poverty line (Minnesota Compass, 2020). The number of children living in poverty in the Lind-Bohanon neighborhood is alarmingly high (35.9%), especially when compared to Minnesota's average (12%) and the United States' national average (18%) (County Health Rankings & Roadmaps, 2020; Minnesota Compass, 2020). Additional economic hardship is experienced by those above the poverty line as 41% of residents are cost-burdened, meaning more than 30% of income is spent on housing costs (Minnesota Compass, 2020). Lind-Bohanon's residents experience a high uninsured rate (13.3%), another facet of economic hardship, as compared to Minnesota (5%) and nationally (10%) (County Health Rankings & Roadmaps, 2020; Minnesota Compass, 2020).

Way to Grow

Way to Grow is a non-profit organization that focuses on early childhood education. This organization is located in North Minneapolis in a neighborhood called Harrison (Way to Grow, n.d.). This organization was created to address the education gap by collaborating with local programs, community partners, and Twin Cities leaders

(Way to Grow, n.d.). In 2004, Way to Grow became an independent nonprofit organization with Carolyn Smallwood as the director (Way to Grow, n.d.). Way to Grow uses a learning program called “Great by Eight,” a holistic learning model that encompasses cognitive, social, emotional, and physical learning (Way to Grow, n.d.). In addition to education, Way to Grow provides resources and support for caregivers and their families through family engagement nights, referrals for services, and cooking classes (Way to Grow, n.d.).

Harrison’s Systemic History. As of 2010, 71% of the Harrison neighborhood is made up of people of color compared to 40% of Minneapolis’ total population (Alliance for Metropolitan Stability [AMS], n.d.). This neighborhood is multicultural, welcoming immigrants and migrants throughout history. In the 50s, Black and Jewish individuals faced discrimination in Minneapolis, leading them to settle in Harrison. Between the 50s and now, there has been an increase in Hmong and Lao immigrants, Somali immigrants, and Latinx immigrants (Harrison Neighborhood Association, n.d.). Of the neighborhood’s population of 3,211, 40.1% identify as Black, 1.6% American Indian/Alaskan Native, 17.3% Asian or Pacific Islander, and 9.1% Latinx (Minnesota Compass, n.d.). 37% of Harrison residents are living in poverty compared to Minneapolis’ 17%. While 49% of the neighborhood’s population are employed, 42.1% of the population have yearly income of \$15,001-\$39,999 (AMS, n.d; Minnesota Compass, n.d.). According to AMS (n.d.), the high poverty rate in this neighborhood is a result of historic systemic policies that discriminated against people of color. Housing discrimination in Minneapolis led to families of color settling in neighborhoods, like Harrison. Families of color also experienced redlining (refusal of loans/insurance), which

influenced the community's socioeconomic status (AMS, n.d.). While these policies occurred in the 1950's, it continues to impact the Harrison neighborhood and the families living within it.

Learning In Style

Learning in Style has provided a rich learning experience for adult immigrants since 1994 by helping them build their literacy and citizenship skills in a supportive and respectful environment (Learning In Style, n.d.). For students that are parents, childcare is available while they are in class, and it welcomes children ages six weeks through five years old (Learning In Style, n.d.). They currently serve around 250 students at a time, 80% of which are East African, 10% are Latino, and 10% are other nationalities (National Literacy Directory, 2020).

Whittier neighborhood. Learning in Style is located in the Whittier neighborhood of Hennepin County in Minneapolis (Minnesota Compass, 2020). The population of the Whittier neighborhood is approximately 14,000 people, and 61% are White, and 39% are people of color (Minnesota Compass, 2020). By age, 82% of the neighborhood is between the ages of 18-64 and 15% are ages 17 and younger (Minnesota Compass, 2020). Of the neighborhood, 22% of the population is foreign born (Minnesota Compass, 2020). The median household income in Whittier is \$34,879, and 24% of the population lives below the poverty line (Minnesota Compass, 2020). The percentage of uninsured people is 11.7% (Minnesota Compass, 2020).

Meetings with RSS Team

On December 13, 2019, we held the first meeting to begin the collaboration between St. Catherine University's OT students and public health workers from RSS at

the Washburn Library in Minneapolis, MN. This meeting opened by introducing our professions, along with brainstorming how each can play a role in dental care which planted the seeds for our collaborative project. The RSS team described their treatment approach, as well as what they thought would be our best way of reaching families in need. The information shared from the RSS team regarding the impact of oral healthcare on overall health impacted the development of project activities, particularly related to family education materials. Students contributed ideas through an OT lens that emphasized developing oral health routines and emphasized the importance of persuasive education that would create buy-in for children and families to engage in these routines.

To finish the meeting on December 13th, 2019, we held small group meetings, dividing into three teams targeting different sites RSS partnered with. OT students and CHWs generated site-specific ideas as to how we may work together to address community needs, especially for at-risk populations. This meeting helped us develop the following plan to have OT students pair with CHWs at three partner locations and present dental care education and resources at after school, family-oriented programs within the community.

Between January and early March, the OT students prepared to meet with the community at the after-school programs; however, after COVID-19 hit and caused a nation-wide shut-down, we had to adapt to the new circumstances. On April 28th, 2020 the OT students met again with the RSS team virtually to collaborate on what our next steps were due to their clinics and schools closing. The OT students gained valuable insight from the RSS team on how the global pandemic was impacting their ability to

connect with families, strategies that were already being used, and what did and did not work best for families. This guided the OT students toward novel strategies that families could access and engage in at home and would positively impact engagement in oral health routines. This meeting helped us develop a new plan: creating educational resource packets that we could mail to families that had previously met with RSS, prioritizing families that were at-risk for oral health disease.

While COVID-19 shifted the project activities (outlined in Chapter 4), the needs assessment findings prior to and during the pandemic led us to the same result, that developing and implementing activities focused on caregiver and family education was the largest need for the populations served by RSS at this time. Through collaboration with the RSS team, the OT students' role in providing caregiver and family education with a focus on integration into the daily routine became evident and was the focus of what will be outlined in Chapter 4.

Chapter 4: Description of Project Activities

Some project activities occurred before the COVID-19 pandemic and did not shift due to the pandemic. Other project activities that were planned for a face to face format shifted when the pandemic occurred. The form of project activities was adapted for virtual school and socially distant delivery options due to the covid-19 pandemic. The OT students divided into two groups to create educational activities to mail families along with oral health tools. IRB approval was obtained for data collection related to outcomes of all project activities before activities were implemented. Grant funding was provided from Delta Dental Foundation of MN to conduct project activities.

Oral Health Modules

As part of the grant funding, the OT faculty member consulted with members of the grant team who developed oral health modules aimed to provide education to allied health providers who are not licensed dental providers. In total, there were 17 learning modules presented to the OT students and CHWs on the team. The modules ranged anywhere between 15 to 30 minutes with topics including dental caries, nutrition, fluoride treatment, and teeth throughout the life course, among others. The OT students were advised to start watching these modules as soon as they were made available, since there were so many modules that needed quite a bit of time dedicated to watch. However, students were given a little over six months to complete watching all of the modules. Students were responsible for the following: watch all the modules, respond to a survey after watching each individual module, and write journal entries about the learning experience (see Appendix C: Oral Health Video Modules Survey, and Appendix D: Journal Prompts). The surveys allowed the students to provide direct feedback to the

creators of the modules, which included things like grammar, pace, content, tone, and reachability to the intended audience. The journal entries enabled students to reflect back on their learning experiences throughout this past year and apply it to other activities during the project, as for many OT students, dental education and resources has been limited to solely their experiences with their own dentists and orthodontists.

Family Education Material and Supply Package

The second project activity was the creation of family education packets. The pre-pandemic plan was to deliver family education at each of the preschools as a collaborative session led by OT students and CHWs. However, when preschools closed, we made a shift to put together a resource packet of oral hygiene supplies and educational resources for the family to promote positive oral health behaviors in the home. An initial team planning meeting was held in May of 2020 to share preliminary ideas of educational materials developed by the OT students and to obtain input and feedback from the Ready, Set, Smile team. The OT students broke into two subgroups to create the materials for the packets and materials were translated into Spanish for Spanish-speaking families by a bilingual CHW staff member at Ready, Set, Smile. The packets were mailed to families with children identified as high risk from RSS clinics run December 2019 through March 2020 or distributed at clinics run in August through November 2020.

Educational Resources

The first group created two educational resources families could utilize to increase positive oral health habits and reduce the risk for oral health disease. The two resources include an informational handout titled *Tips for Terrific Teeth* (see Appendix

E: Tips for Terrific Teeth) and a game titled *Happy Tooth and Sad Tooth* (see Appendix F: Happy Tooth and Sad Tooth).

Tips for Terrific Teeth is a one-page reference handout with ten easy to follow tips on oral health care. The purpose of this tool was for families to have an easy reference resource related to oral health. Within the packet of materials, families were recommended to post the handout in an easy-to-see location in the home so parents and children could reference it and be reminded of simple steps to keep their teeth and oral cavity in good condition. Some of the tips listed on the sheet include, but are not limited to, brushing your teeth twice per day for two minutes, avoiding sugary foods, and drinking water from the tap. In addition to the written tips, we included a simple reference image for each tip. These images were used to benefit young children who are not yet reading and individuals whose native or primary language is not English. We concluded the informational sheet with a one-sentence overview on the importance of following these tips along with reiterating that good oral health will contribute to good overall health. The group used information from the oral health modules, literature reviews (see Appendix A: Individual Literature Reviews), and information from the American Dental Association to develop the *Tips for Terrific Teeth* resource and determine the top ten tips for parents and children to reduce the risk for dental disease.

After the resource was developed within Microsoft Word, the group ensured formatting for the Americans with Disabilities Act (ADA) font style, size, and color contrast recommendations and formatted it in an easy to read layout. Tips were grouped together by similar topics to support the flow in order and clip art images were used that would be culturally relevant to a variety of populations. During the final

revision phase, Microsoft Word's spelling, grammar, and readability statistics were used to ensure a reading level that would be most accessible to our audience. The final version includes an easy of reading equivalent to a Flesh-Kincaid 3.7 grade level with a Flesch reading each score of 77.6. It sent to a bilingual community health worker for translation into Spanish and both the English and Spanish versions were finalized as a PDF for consistent formatting for printing purposes.

The *Happy and Sad Tooth* game reinforces the ten tips in the *Tips for Terrific Teeth* handout. Current research indicates that game-based learning provides reinforcement and repetition which can be effective in improving children's oral health knowledge and habits, ultimately leading to less dental plaque and decay (Angelopoulou et al., 2016; Haleem et al., 2016; Maheswari et al., 2014; Manchanda et al., 2014). Therefore, as the team, we determined it could be beneficial to create a game to provide families the opportunity to apply and reinforce the knowledge learned from the handout to optimize retention of information and encourage practicing healthy oral hygiene. We specifically modeled the game after a study which implemented flashcards of do's and don'ts on oral hygiene for children (Maheswari et al., 2014). An original idea was to have two cups labels "do's for oral health" and "don't for oral health" and then provide flashcards describing oral health habits with images to put into various cups. Through the design process, the group determined to create it as a game with clip-art images and Velcro adhesives and with a happy tooth and sad tooth game board to incorporate more preschool age and family friendly focus.

The game included an envelope with clip-art images (game pieces) of various foods and activities that are considered healthy or unhealthy for our mouths. In addition,

a two-sided laminated game board with a “Happy Tooth” and “Sad Tooth” side was provided. Players draw a game piece and place it on the side of the board in which it fits. An answer key with short descriptions providing additional education to families was also provided. Similar to the *Tips for Terrific Teeth*. All of the game items were reviewed for ADA recommendations on font style, size, and color contrast and the answer key was run through Microsoft word for readability features. The initial set of information was a 5th grade level, thus revisions were made to have the final version at the 4th grade level. The answer key was also translated into Spanish for Spanish-speaking families. The game pieces were printed on cardstock and Velcro dots were placed on the back of each and were provided in an envelope to families. The game board was laminated and Velcro dots were added to the boxes for game play before distribution.

Routine Based Resources

The second group created a customizable routine tracker to integrate teeth brushing into the bedtime routine (see Appendix G: Routine Tracker Resources). The routine tracker was developed to support RSS’s and Delta Dental’s classroom education modules’ focus on building daily pro-oral health behaviors. Additionally, group discussions on our literature review research (Appendix A: Individual Literature Reviews) revealed that establishing and adhering to routines is a challenge for all families and especially low-socioeconomic families. The routine tracker was intended to support consistent bedtime routines by assisting adherence to teeth brushing regardless of which guardian may be in charge, and ingraining the activity as part of an automatic bedtime routine as the child developed.

One member of the group researched various activity tracker formats in a general Internet search and brought an example to the group that was agreed upon (Appendix G: Routine Tracker Resources). The group discussed the advantages and disadvantages of filling out the routine elements on the tracker on behalf of families prior to sending or leaving it blank for them to customize. Identified advantages of providing a completed template were the instant implementation and assurance that teeth brushing would be incorporated into the routine. Advantages of leaving the templates blank for families to customize were identified as fostering a conversation between children and parents on bedtime routines and oral health, allowing for cultural differences in routines and rituals associated with bedtime, and opportunity for children and parents to engage in a craft activity that would endear the child to adhere to the routine due to their involvement in its creation. The group decided on a blank, customizable template (Appendix G: Routine Tracker Resources).

The group developed a one-page educational sheet to explain the purpose and use of the activity tracker (Appendix G: Routine Tracker Resources). The handout emphasized brushing teeth for two-minutes twice a day as an important part of the bedtime routine. All group members collaborated on a draft version of the handout and provided rationale for routine trackers and daily oral health behaviors. A group member created a tracker at home and took step-by-step photographs to guide caregivers through the process to aid learning styles and English literacy barriers. The written draft was edited to reduce language to fit instructional images. The handout draft underwent multiple revisions to ensure a sixth-grade reading level to serve the general public and was based on Microsoft Word accessibility reports. The handout was sent to the

research coordinator for final approval, potential language translation by community health workers, and printing.

Other Packet Materials

In addition to the educational materials and routine-based materials, all packets included a welcome and introduction letter to the packet, toothbrushes for all family members, toothpaste, dental floss, and child-sized dental pick flossers, a two-minute sand timer, a package of colored pencils, bookmarks for coloring, and stickers and beachballs as incentive prizes the families could use to reinforce and reward positive oral hygiene behaviors in the home. Pictures and additional information on these items can be found in Appendix H: Complete Packet Materials and Appendix I: Project Presentation.

Packet Assembly and Distribution

The research coordinator organized a socially-distant mail packing day at St. Catherine's University on June 19th, 2020. Prior to the meeting, the research coordinator collected supply needs and obtained necessary materials. Our group identified copies of the educational handout, ~8x11" card stock, adhesive Velcro dots, and a coloring utensil as needed supplies to send in the mailers as well as scissors and rulers to create the blank routine trackers. On the day of packing the envelopes, three of our four group members were able to attend and took an assembly line approach to create the blank routine trackers. The research coordinator provided manila folders as cardstock and a guillotine paper cutter, and one group member removed the excess label flap. Two group members measured and marked the appropriate distance to ensure five evenly distributed tabs for the tracker. All group members cut the marked

lines with scissors to create the routine tracker tabs. No Velcro adhesive tabs were added due to lack of supplies but was completed by the research coordinator at a later date. These packets were mailed out beginning at the end of June and through August 2020 to children identified as high risk from RSS clinics run December 2019-March 2020. On August 28th, 2020, OT students and RSS staff held a virtual meeting to update on progress and determine next steps, as clinic spaces were starting to open up for RSS. RSS staff decided to take a handful of resource packets and hand them out during clinics or at partnering schools.

After assembling the envelopes, the students received a list of 83 families' contact information from RSS. The families listed had at least one child who attended a previous RSS school clinic and was identified as having cavities. Each member on the OT and RSS team was assigned families to contact and log their consent to receive oral health supplies and educational materials for their household, and/or be contacted by RSS to schedule a free dental clinic for their children 14 years old and younger (see Appendix J: Contact and Consent Script for Caregivers). St. Catherine OT students and active RSS CHWs contacted the families by telephone.

The families were asked if they'd like to receive an oral health supplies and educational packet, provided their current address to receive materials, confirmed the number of members in their household (adults and children) and their ages to receive age-appropriate toothbrushes, and their consent to be contacted for a potential dental clinic visit and/or follow-up after they received the packet. For those families who could not be reached by phone after two to three attempts, a letter with information about the resources we were able to provide with a self-addressed and postage paid postcard

were mailed to families to try to reach more families to distribute resources and offer clinic visits (see Appendix K: Letter & Postcard Templates). After consent and contact information data was gathered by phone calls, envelopes containing materials were mailed out to families willing to participate.

Family Outreach, Consent, and Follow Up

Approximately one month after materials were sent or distributed at clinic sites, St. Catherine faculty and students began following up with families by phone call, text message, or email to receive feedback on materials sent and check in on any additional family oral health needs. Families were asked to complete a survey to provide students and RSS with feedback (see Appendix L: Oral Health Family Education Survey).

Second and third attempts were conducted for phone call, email, and/or text message follow-up if initial attempts were unsuccessful. St. Catherine University OT group was designated the responsibility for the follow-up calls and texts to families to continue to collect data related to project activities as RSS team members were working on clinic activities at that time.

Instructional Video

After sending the mail envelopes and connecting with families with follow-up phone calls and surveys, a need was identified for further explanation to caregivers on the use and importance of items included in the packets. The two groups that developed materials designated a contingent of members to create an educational video to explain specific materials included in the mailed envelopes. The members met on Google Meet and recorded a six-minute video to be shared with caregivers. During the video, members explained the oral health items sent to families and how they assist with oral

health and fewer dental problems for the child and their families. The intentions of this video were to help families and participants understand how to properly use materials sent out within the packets. Due to a strategic pause in services by RSS due to COVID, we were unable to use the videos with families receiving packets after the initial mailings and collect data on their effectiveness. However, the video is set and available for use by RSS when their services are able to resume.

Chapter 5: Description of Assessment Processes and Data Gathering

Multiple surveys were developed and administered throughout the course of this project to determine the efficacy of project materials and recommendations. The Integrated Oral Health Team Member Pre- and Post-Survey and the Oral Health Video Modules Survey were developed directly by the research coordinator, and OT students and RSS staff and partners provided responses. The Oral Health Family Education Survey was developed in collaboration between the research coordinator and OT students. This survey was provided to participating families as a follow-up to receive feedback on educational materials and supplies provided in the packets (see Appendix M: Integrated Oral Health Team Member Pre- and Post-Survey). The team also collected informal anecdotes from families during follow-up phone calls. All of these data collection activities were approved through the St. Catherine University IRB committee. The project activities, results, and recommendations were presented at St. Catherine's University Master of Arts in Occupational Therapy Master's Project Presentations virtual event on December 13th, 2020 (see Appendix I: Project Presentation).

Integrated Oral Health Team Member Pre- and Post- Project Surveys

The research coordinator created a comparison survey to assess changes in the interdisciplinary team's level of oral health knowledge, understanding of oral health education concepts, and attitudes on interprofessional roles in oral health. The online survey was administered to OT students, RSS CHWs and staff, and licensed dental providers involved in the grant funded project. The 10-item survey implemented 10-point

scales and open-ended responses to collect data. The survey took approximately 10 minutes to complete.

At the completion of the project, the interdisciplinary project team completed a comparison survey via the same method and delivery as the pre-survey. The comparison data was used to create recommendations for future interdisciplinary team approaches to support pediatric health outcomes as well as to assist in determining the effectiveness of project activities on increasing oral health knowledge and interdisciplinary knowledge and skills.

Oral Health Modules Survey

OT students and CHWs watched 17 oral health module videos and completed an online survey after each module which was created by the research coordinator. In total, there were eight questions on the Oral Health Module Survey, which consisted of mostly open-ended questions that allowed the students to provide detailed and honest feedback to the research coordinator and module creators. The overarching purpose of this survey was to assess the educational efficacy and content of the online oral health modules through an interdisciplinary perspective.

The survey asked the participants to document what they learned, what they already knew, and what could be improved within the modules regarding content, tone, teaching method, information, and presentation. Though the surveys were confidential, responses were tracked through the last four digits of the participant's phone number on each survey. This method allowed the team to document knowledge prior to viewing the modules, while viewing modules, and post-module viewing.

Follow-up Survey with Families who Received Packets

OT students collaborated with the research coordinator to develop the survey for caregivers after they had received educational material packets by mail or directly through RSS. This survey intended to understand of the efficacy of educational packets, both in terms of perceived value and use by the families. Survey delivery methods consisted of email, text message, and phone calls, depending on the family's preference noted during initial outreach calls (see Appendix J: Contact and Consent Scripts for Caregivers). Data from the survey was kept anonymous and decontextualized to protect family identities and to preserve their relationship with RSS.

To develop the survey, available OT students met online with the research coordinator and determined appropriate questions to gather feedback on the effectiveness of materials on improving child and families' oral health routines. During the collaborative development, OT students emphasized the importance of hearing directly from families on what their needs were. The survey directly solicited recommendations from families for change for future project iterations. Survey questions consisted of multiple choice and open-ended questions asking families what materials they used, if they plan to continue using them, how often they used the materials, the ease of use, likes/dislikes, and overall learning. Other OT students in the project worked with the research coordinator on the IRB process so that all students were able to have experience in development of assessment activities for the project.

Finally, during follow-up phone calls, emails, and texts, some families shared other comments related to the packets separate from the survey which will be shared as part of the family and caregiver findings in chapter 6.

Chapter 6: Results and Recommendations

The following chapter outlines the results from surveys completed by project team members and community participants, and subsequent recommendations generate from the findings. The surveys, results, and conclusions were organized by key topics, including interdisciplinary learning, oral health module topic competence, and oral health family education. Recommendations were generated for our community partners at RSS, the St. Kate's OT program, and the OT profession based upon the results.

Interdisciplinary Learning

An online survey assessed OT students', community health workers' (CHWs), and licensed dental professionals' level of knowledge on the roles of others in oral health wellness and health promotion before the launch of the project in December 2019 and at the project's completion in fall of 2020. Respondents indicated their level of knowledge on a Likert scale of 1 (no knowledge) to 10 (complete knowledge) and answered open-ended prompts to provide a personal definition or description of the terms "oral health and wellness", "an integrated interdisciplinary primary care team", the role of their profession in the project, and the benefits and challenges of working in an interdisciplinary team.

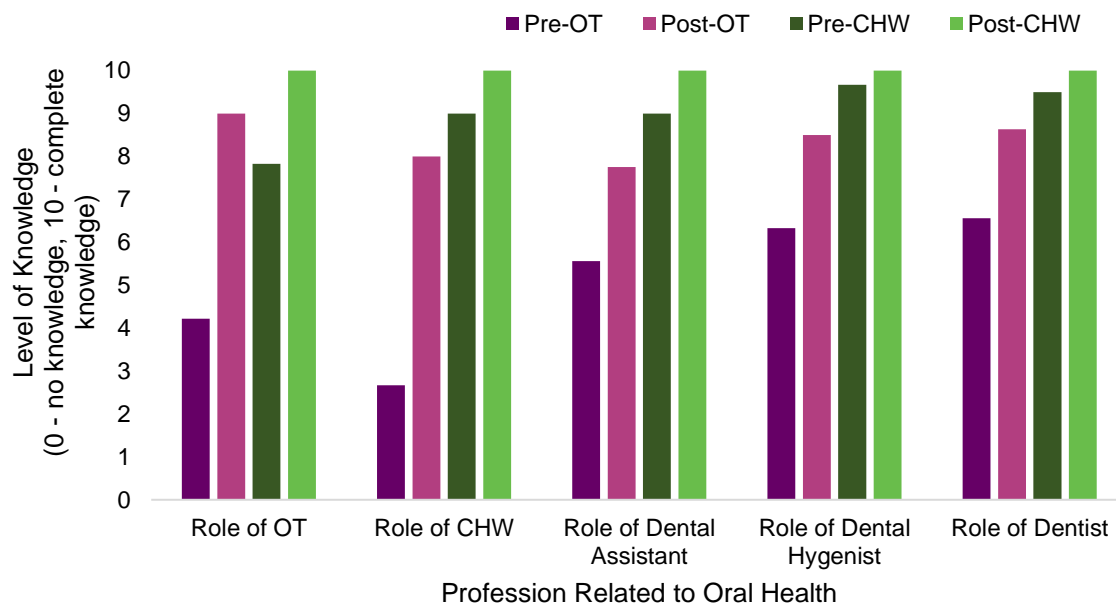
There was a high level of turnover from pre- to post- project for the RSS CHWs due to pandemic-related pauses in RSS services and resulting furloughs and layoffs of community health workers. CHW mean ratings should be reviewed with caution due to variable n from pre to post for that group (pre-survey $n = 6$, and post-survey $n = 1$). The following results assess OT students' response data.

Knowledge of Professional Roles

Nine OT students participated in the pre and the post survey. In the pre-survey, OT student mean ratings of knowledge 2.67 a scale of 10 for the role of CHW at the lowest and 6.56 on a scale of 10 for the role of dentists at the highest. Across all five professions, OT students demonstrated an increased mean rating of knowledge of the role of all of the professional in oral health and wellness post-project as compared to pre-project (Figure 1).

Figure 1

Knowledge of Professional Roles in an Interdisciplinary Team, Pre and Post Project Activities



Note. This figure shows the mean Likert scale rating pre and post project of OT students and community health workers (CHW) on their self-rated level of knowledge of the role of the various team members in the project related to oral health promotion. For OT students at pre and post $n = 9$. For CHWs pre-project $n = 4$ and post project $n = 1$.

Professions like dentist, dental assistant, and dental hygienist that are more explicitly related to oral health remained areas where OT students reported a higher level of knowledge within the context of an interdisciplinary team promoting oral health and wellness. OT students' knowledge of the role of CHWs increased from a mean of 3 to 8. On average, OT students more than doubled their knowledge of how OT can contribute to oral health and wellness for clients and families. OT students did not report a 10 for knowledge of any profession, indicating the potential for continued learning and growth in their knowledge of specific roles in an interdisciplinary team promoting oral health and wellness.

Definition of “An Integrated Interdisciplinary Primary Care Team”

OT students' definition of “an integrated interdisciplinary primary care team” evolved and became more refined in the post-survey data. Pre-survey definitions simply entailed the concept of “different professions” working together to achieve shared outcomes. Most of the pre-survey definitions did not detail how or in what manner the different professions would work towards the common goal. Post-survey responses evolved the definition to include words and phrases such as “comprehensive and collaborative care”, “communicative”, “coordinated”, and the dynamic of each profession “supporting the common goal idea by adding their area of expertise”. The increased specificity of these definitions appears to correlate with the increased level of knowledge of other professions. Additionally, the responses demonstrate a more nuanced understanding of the manner in which disciplines must integrate to share a common purpose rather than remaining silos.

Definition of OT's Role

OT students' pre-survey responses regarding the role of OT tended to be broad applications of how OT's "holistic" lens could be applied to oral health occupations. Some responses went further to posit OT's general intervention approaches in providing adaptations, education, addressing body function sensory issues, and fostering routines could be used for oral health promotion. One response was honest in its admission that they did not know what OT's role could be in the oral health promotion space.

OT students' post-survey responses demonstrated a shift towards a more specific understanding of what the OT role entailed for this project specifically, and potentially larger roles in future public health initiatives. Specific to the project, responses included references to the educational materials developed and delivered to families and follow up communication to gather their feedback. However, a deeper understanding of the potential of OT's role in public health promotion and primary care was seen in responses as well. This was especially apparent in OT's role of understanding challenges and barriers and engaging motivation in order to provide valuable education. Responses included the ideas that OT's role in understanding "barriers and supports" to health care access combined with the "task burden" of caregiving and daily health behaviors can aid simplifying information to be the most impactful for recipients. OTs domain in understanding barriers to oral health helps prioritize what information and outreach to lead with what motivates change. Responses also touched on understanding the motivating factors behind child and family engagement with educational materials to facilitate learning of high-impact information.

Benefits and Challenges of an Interdisciplinary Team

The pre- and post- surveys captured OT students anticipated and experienced benefits and challenges of working in an interdisciplinary team. Prior to the first interdisciplinary team meeting in December 2019, OT students posited that potential benefits of working in an interdisciplinary team would be to “learn” from “multiple perspectives” and “collaborate” by “working on a team”. The most commonly reported anticipated challenges were role definition, understanding the various professions, balancing the emphasis of each specialty, and communication to remain on the “same page”.

Post-survey results reflected OT students actual experience working on the interdisciplinary team. Common benefits centered on the “robust knowledge” and cultural context that strengthened the development of “client centered” educational materials. The majority of responses acknowledged how pandemic disruptions impacted the experience of the project and added unforeseeable challenges to interdisciplinary communication, collaboration, and service delivery to families and children as activities were modified to be virtual or socially distant. Further challenges exacerbated by the pandemic and ensuing precautions were scheduling and participating in project activities, and the inability to share physical space to communicate as a team and with families.

Oral Health Module Learning

The intent of the oral health video modules in this project was to increase oral health knowledge to support implementation of other project activities. The oral health module surveys were used to determine how much knowledge was gained about oral

health after completing the series of videos. Data was collected both qualitatively and quantitatively. Qualitatively, themes were derived by the OT students using a coding process with data collected from the oral health video module surveys completed by both the OT students and CHWs after each module (see Appendix N: Oral Health Module Themes). Quantitatively, self-reported levels of knowledge on oral health concepts was assessed by the integrated oral health pre- and post-survey.

From each oral health video module, two or three Level I themes were found. Three Level II themes were coded by the OT students across all nine module topics based on the Level I themes including: increased knowledge of the dental profession, increased knowledge of proper care of oral health, and increased knowledge on why to care about oral health. Increased knowledge of the dental profession was demonstrated through student reports of new understanding of the many subspecialties of dental care and how OT can be included in this approach. Increased knowledge of proper oral health care was demonstrated through student reports of learning the benefits of fluoride and proper brushing and flossing techniques to help prevent cavities and decay.

Increased knowledge of the importance of oral health was demonstrated through student reports of learning that lifestyle factors and social determinants of health affect oral health. Through the analysis of these themes, a conclusion was drawn that oral health has a large impact on overall health throughout the lifespan. This conclusion can be backed up by research that concludes that proper oral health care can benefit occupational participation by decreasing systemic diseases, increasing school participation, and increasing social participation which is concurrent with recent research (Duley et al., 2012; Seirawan et al., 2012).

The ten expected learning outcomes, determined by the creators of the modules, were analyzed using the pre- and post-integrated oral health survey taken by the OT students (see Figure 2). All ten outcomes saw a rise in mean competency ratings as demonstrated in Figure 2. It was not surprising to the OT students that motivational interviewing and cultural humility saw the least amount of change in competence, as these are core components learned in OT curriculum. The data gathered from this survey demonstrates that a series of oral health modules can greatly increase the general knowledge of oral health in OT students. The data suggests that OT students can learn this information and therefore utilize it and apply it to practice and improve overall health in their clients.

Figure 2

Knowledge of Educational Topics Pre and Post Oral Health Modules



Note. Mean Likert scale rating of OT students' ($n = 9$) competence pre-project and post-project on the topics covered in the oral health modules.

Oral Health Family Education

The purpose of the survey was to gather feedback from families on the educational materials and dental supplies to assess the effectiveness of project activities and generate recommendations for future caregiver education programming for RSS. Eighty-three families were initially contacted to gauge their interest in receiving an oral health supplies and educational materials packet, and 29 of those reached consented to participate. An additional 16 packets were delivered directly to families at various on-site RSS dental clinics. A total of 45 families received packets. Upon follow-up outreach by OT students, 11 families shared phone, email, or text comments. Alongside anecdotal responses, caregiver participants were asked to share feedback through a survey that could be completed over the phone or a web link provided via text or email. Twelve surveys were initiated, and six completed surveys were received.

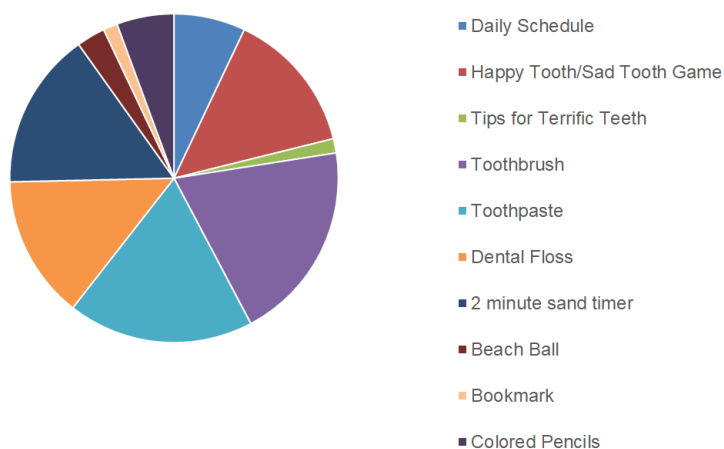
Family Feedback

The dental supplies and Happy Tooth and Sad Tooth game received the greatest number of positive comments compared to other materials provided (see Figure 3). The most commonly used items were dental supplies (66.67%) (i.e., toothbrush, toothpaste, two-minute sand timer, and dental floss). Participants reported they were more likely to continue to use the dental supplies (73.33%) compared to other materials provided. This reflects the value of providing tools used in daily oral health behaviors. Additionally, the Happy Tooth/Sad Tooth game was used more frequently (10%) than the routine tracker (3.33%). This may reflect that the added step of filling out the blank template was not clear, appealing, or feasible within the households. *Tips for Terrific Teeth* were not utilized (0%). Families also reported they wanted to continue to use the *Happy*

Tooth/Sad Tooth game (13.33%) followed by the routine tracker (6.67%) and *Tips for Terrific Teeth* (3.33%), respectively. The popularity of the *Happy Tooth/Sad Tooth* game relates to previous research demonstrating the effectiveness of game-based learning in improving children’s oral health knowledge and habits (Maheswari et al., 2014). All families reported using packet materials at least once a day ($n = 6$), and three reported using materials more than once a day.

Figure 3

Frequency of affirmative comments related to project materials from families during survey collection



Note. Frequency of comments related to use or value of each of the items in the mail packets gathered from survey items and phone, text, or email comments.

Families were asked who in their households used the materials, and the most common response was solely the children followed by caregivers and their children. Increasing engagement of the entire family with the materials is an area to consider, given that caregivers play an impactful role in promoting oral health for children as oftentimes children follow routines and habits their caregiver models (Kumar et al., 2014). The reported ease of activity and material use ranged from very easy ($n = 2$),

easy ($n= 3$), to somewhat easy ($n = 1$). The ease of activity use reflects efforts for materials to be developed at an accessible reading level to the general public and use of visuals.

Participants provided feedback on what they liked about the provided materials. Common themes included that the items were useful, motivating, and benefitted children's learning. A majority of participants reported that they would like the same materials again and that there wasn't anything they did not like about the materials. However, one participant reported that due to a busy lifestyle it was challenging to incorporate materials into their family's routine and carryover was difficult. This aligns with Roy et al. (2004) findings that low-income families have less discretionary time, and the reality of the effect of pandemic-related distance learning on household's time and focus.

When survey participants were asked if the materials and activities changed how their family cares for their teeth, four participants reported yes and two reported no. The two participants who reported no change cited having established healthy oral care habits prior to receiving the educational materials. Participants who reported changes to their family's oral health behaviors cited that their children were motivated to brush their teeth more often when using the timer and the education on the effects of sugary beverages increased their likelihood to modify their diet. Participants also reported that they learned how long to brush their teeth for and what foods increased the chances of cavities.

Participants provided feedback on what to modify for potential future packets. Participants reported that they would like mouthwash and teeth whitening supplies in

addition to the supplies provided. A few participants felt that their children were too old for the activities. Future iterations of this project should take into consideration the additional supplies families requested and create more activities that are applicable to a wider range of age groups. Overall, our project appeared to be successful in improving families' oral health knowledge and habits, but more data is needed to make this implication.

Recommendations

Based on the survey results of the interdisciplinary learning, oral health module learning, and family feedback, there are recommendations to strengthen future partnerships between St. Kate's OT program and RSS. Data demonstrates perceived value to integrated interdisciplinary primary care teams for oral health promotion. The value is not fully explored and OT students would benefit from continued engagement and learning on roles in an interdisciplinary team focused on oral health and wellness. Recommendations for future project activities include more meetings between interdisciplinary groups and more time working face to face with site-specific interdisciplinary teams. We feel this would improve the quality of knowledge gained for practitioners and project outcomes. This project provided an opportunity for CHWs and OT to learn about their professional roles in oral health care in addition to the role of a dentist, dental assistant, and a dental hygienist.

OT has a unique role in improving oral health outcomes, and it would be beneficial to provide education to dental professionals on the role of OT in oral care to improve interdisciplinary approaches and collaboration. Since there was a significant increase in knowledge of oral health topics, we encourage all OT students to watch the

modules that are relevant to the OT profession to provide clients with holistic, client-centered care that includes education or interventions regarding oral health. It would also be beneficial for RSS CHWs to watch the modules to develop further knowledge on oral care and learn important information they could share with families they interact with. An additional suggestion includes utilizing volunteers when possible, either with RSS or partner sites to save time and money with creation of materials, such as assembly of materials to increase the availability of materials and reach more families, more frequently.

Overall, the project highlighted the need for OTs to be strong advocates for their value on interdisciplinary teams in primary care and public health fields. OT should advocate for professional involvement in primary care because current involvement is sparse, and OT can serve a great need by educating and working with primary care physicians and dentists in helping reach underserved children and families. OT can effectively educate families by understanding barriers and supports of their daily contexts to prioritize information, consider motivating educational elements to increase engagement with materials and self-management behaviors, connect families to community resources like RSS, and help families create oral health routines.

In addition, OTs could also promote oral health by providing consultation and education to community-based workers on the efficacy of routines in self-management behaviors and game-based interventions and education. Relatedly, OT can explore options for delivering services outside of traditional healthcare settings. Schools and community settings provide great opportunities for OTs to advocate for and work with families in creating healthy routines and habits, providing adaptive equipment, and

meeting the sensory needs of children with disabilities to improve oral care of children.

We urge OT students and practitioners to be great educators, collaborators, and advocates with families and professionals to improve oral health outcomes for underserved children. Individual student learning and reflections can be found in Appendix O: Student Learning and Reflections.

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Chapter 7: Appendices

Appendix A: Individual Literature Reviews

Literature Review by Kiersten Anderson

“Oral health plays an important role in general health, and oral hygiene maintenance prevents many diseases” (Yazdani, 2018, p. 275). Poor oral health can result in dental caries, which are a worldwide issue among children (World Health Organization, 2020). Dental caries can cause pain, tooth loss and infections, and in rare cases death (WHO, 2020). However, dental caries is preventable and can be treated in the early stages (WHO, 2020). Furthermore, dental caries can be prevented by practicing good oral hygiene and lifestyle habits such as brushing your teeth 2x/day, limiting sugar intake, visiting the dentist regularly, being physically active, and eating a well-balanced diet (Ready, Set, Smile, 2020). Unfortunately, socioeconomic status (SES) serves as a major barrier to children’s oral health (Hamasha et al., 2006; Peres et al., 2007; Piovesan et al., 2010). Since families’ economic status and living situation are unlikely to change, increasing parents’ oral health literacy can support children’s oral health status (Khodadadi et al., 2016). Researchers have found that receiving oral health family education positively enhanced children’s oral status and behaviors (Aljafari et al., 2017; Bhardwaj et al., 2013; Manchanda et al., 2014). More specifically, motivational interviewing, repetition and reinforcement, experiential learning and game-based teaching are some of the most effective strategies used for educating parents and children on oral health (Angelopoulou et al., 2015; Haleem et al., 2016; Maheswari et al., 2014; Manchanda et al., 2014). Furthermore, an interdisciplinary approach within dental care has found to be beneficial in enhancing children’s oral health outcomes,

particularly for low-income children (Biordi et al., 2015). Parents and dental professionals reported that working with other healthcare providers, including occupational therapists, can lead to optimal dental care outcomes (Nelson & Webb, 2019). Therefore, oral health education implemented by an interdisciplinary team, including occupational therapists, can positively impact oral health outcomes among children from low-income families.

Social Determinants of Health & Oral Health

SES and oral health literacy are social determinants of health that can either support or hinder a child's oral health (Healthy People, 2020). Social determinants of health can be defined as "conditions in which people are born, live, learn, work, play, worship, and age" that impacts health and quality of life (Healthy People, 2020, para 5). The five main social determinants of health include economic stability, education, social and community context, health and health care, and neighborhood and built environment (Healthy People, 2020).

Socioeconomic Status (SES)

SES impacts oral health outcomes among children (Hamasha et al., 2006; Peres et al., 2007; Piovesan et al., 2010). Children from lower SES backgrounds have been found to have poor oral health including higher prevalence of cavities and untreated cavities (Hamasha et al., 2006; Peres, et al., 2007; Piovesan et al., 2010). Some possible reasons for the decreased oral health could be due to differences that have been found in oral health behaviors among children from higher SES compared to those from lower SES (Hamasha et al., 2006). Some of these behaviors include brushing their teeth less than the recommended frequency, having a greater intake of sugared

beverages (e.g., juice), and having reduced access or use of dental services (Hamasha et al., 2006; Peres et al., 2007). Furthermore, children who moved from low SES to high SES increased their frequency of dental visits, oral health habits, and dental caries status (Peres et al., 2007).

In addition to the poor oral health outcomes among children from low SES families, there is evidence to show that overall health related quality of life is also poor (Piovesan et al., 2010). More specifically, children from low SES are more likely to have poor oral symptoms, emotional well-being, social well-being, and functional limitations (Piovesan et al., 2010). Some possible reason for these children to have poor overall health related quality of life is due to having dental conditions such as untreated cavities and maxillary overjet (Piovesan et al., 2010). They may avoid talking with other children or may not be accepted by their peers due to having these type of conditions (Piovesan et al., 2010). This highlights the importance of an aesthetic smile in social situations and psychosocial well-being (Piovesan et al., 2010). Also, untreated dental caries can cause significant pain and possibly a tooth infection (CDC, 2019). This can lead to the child having issues with playing, eating, speaking, and learning (CDC, 2019). In sum, low SES negatively influence's children's oral health behaviors and status as well as their overall well-being. Fortunately, children from low-income families can improve their oral health through increasing parent oral health literacy (Khodadadi et al., 2016).

Oral Health Literacy

Parents' oral health literacy significantly impacts children's oral health outcomes (Khodadadi et al., 2016; Miller et al., 2011; Yazdani et al., 2018). Oral health literacy can be defined as "the degree to which individuals have the capacity to obtain, process,

and understand basic health information and services needed to make appropriate oral health decisions” (Yazdani et al., 2018, p. 275). Yazdani et al. (2018) found that only 48.5% of parents in their study had adequate oral health literacy and the rest of the parents had marginal or inadequate oral health literacy. Miller et al. (2011) found that low levels of caregivers’ oral health literacy was related to low dental health status among children even when race and income were controlled. Similarly, lower levels of parental oral health literacy were related to a reduced frequency of tooth brushing and dental visits and a greater frequency of poor oral health behaviors in the parents such as smoking (Yazdani et al., 2018). Parents who had higher oral health literacy was related to lower decay, missing, and filled teeth indices as well as greater oral health behaviors among their children (Yazdani et al., 2018). In a study examining the influence of parents’ oral health literacy on children’s dental health status, researchers found that increasing parents’ oral health literacy can support children’s dental health status since parents’ living situation and economic status will likely not change (Khodadadi et al., 2016). These studies show that family income are not the only factors influencing children’s oral health status (Khodadadi et al., 2016; Miller et al., 2011). In sum, research has demonstrated that parents’ oral health literacy and oral health behaviors have a significant impact on children’s oral health status and behaviors (Khodadadi et al., 2016; Miller et al., 2011; Yazdani et al., 2018).

Education & Oral Health Outcomes

One mechanism for addressing oral health literacy needs is through family centered oral health education programs. Current research has found that parent and/or child oral health education positively influences oral health outcomes among children

(Aljafari et al., 2017; Bhardwaj et al., 2013; Manchanda et al., 2014). Some dental providers have partnered with schools and childcare centers to provide oral health programs. Research has shown that children who participated in a school-based oral health education program had a decrease in plaque and gingivitis (Bhardwaj et al., 2013). Additional evidence suggests that these programs may be more effective if parents were involved in order to reinforced learning at home, which could have long-term benefits (Bhardwaj et al., 2013). Researchers have examined the effectiveness of parent and child oral health educational strategies on children's oral health outcomes (Angelopoulou et al., 2015; Haleem et al., 2016; Maheswari et al., 2014; Manchanda et al., 2014). A study by Manchanda et al. (2014) found that families received oral health education led to children having less decayed, missing, and filled teeth (Manchanda et al., 2014). Programs that incorporate the child and family and cover topics such as teaching children and families how to distinguish between healthy and unhealthy foods and basic oral hygiene techniques and behaviors may lead to better oral hygiene habits at home (Aljafari et al., 2017; Bhardqai et al., 2013). These suggestions are just a few of many educational strategies that have been studied related to oral health education and oral health outcomes.

Motivational interviewing, reinforcement and repetition, experimental learning, and game-based oral health education programs have been found to be more effective in improving children's oral health knowledge and habits compared to traditional oral health education programs (Angelopoulou et al., 2015; Haleem et al., 2016; Maheswari et al., 2014; Manchanda et al., 2014). These types of educational strategies are more interactive and motivational which can lead to better retention of oral health information

and willingness to practice healthy oral hygiene habits at home. Because of this, children across several studies were reported to have less dental plaque and decay compared to children receiving conventional oral health programs (Angelopoulou et al., 2015; Haleem et al., 2016; Maheswari et al., 2014; Manchanda et al., 2014). In conclusion, motivational interviewing, repetition and reinforcement, experimental learning, and game-based teaching are effective strategies used for educating parents and children on oral health (Angelopoulou et al., 2015; Haleem et al., 2016; Maheswari et al., 2014; Manchanda et al., 2014).

Interdisciplinary Approach & Client Outcomes

Some studies have indicated that the use of an interdisciplinary approach to client education can lead to greater client outcomes (Biordi et al., 2015; Fedele et al., 2013; Will et al., 2019). Interdisciplinary approach can be defined as “multiple health workers from various professional backgrounds working together with clients, families, caregivers, and communities to deliver high-quality client care” (Will et al., 2019, p. 159). There is evidence that an interdisciplinary approach for client care is related to greater client outcomes and satisfaction due to its contribution to high-quality and client centered care (Will et al., 2019). Current research has found that an interdisciplinary approach within dental care can improve oral health outcomes, particularly among low-income children (Biordi et al., 2015). More specifically, applying fluoride varnish and parent education had a significant impact on children’s oral health status and behaviors (Biordi et al., 2015). Furthermore, the average number of dental caries reduced from the first to second dental visit (Biordi et al., 2015). Also, the use of sippy cups, which is associated with dental caries, decreased throughout the study (Biordi et al., 2015).

Additionally, the frequency of tooth brushing and dental visits increased from the first visit to the third visit. (Biordi et al., 2015). Overall, these findings suggest that an interdisciplinary approach to client education is effective in improving low-income children's oral health (Biordi et al., 2015; Fedele et al., 2013; Will et al., 2019).

Occupational Therapy & Oral Health

Current research suggests occupational therapy can be a valuable asset to oral health education from an interdisciplinary team and may lead to enhanced oral health outcomes among children from low-income families (Biordi et al., Fedele et al., 2013; Nelson & Webb, 2019; Will et al., 2019). Occupational therapy has a unique role in promoting positive oral health outcomes (Cermak et al., 2015; Nelson & Webb, 2019). Occupational therapist' role is to support participation by helping clients either gain skills or adapt tasks and/or the environment (Nelson & Webb, 2019). Occupational therapists may work on fine motor, feeding, postural stability and positioning, and sensory processing with children who have disabilities in order to promote good oral health (Nelson & Webb, 2019).

Additionally, occupational therapy has a unique role in helping children with sensory processing issues improve oral care within the home and dental office (Nelson & Webb, 2019). Some strategies that occupational therapists may implement in the home include providing visual supports such as a visual clock and visual schedule (Nelson & Webb, 2019). Also, establishing an oral care routine at the same time each day and in the same sequence of tasks helps decrease anxiety and ensure predictability (Nelson & Webb, 2019). Occupational therapists may recommend sensory-based

strategies such as providing oral massage to the face and mouth or using toothpaste with a mild taste and smell (Nelson & Webb, 2019).

Occupational therapists might implement strategies for children with sensory processing issues that promotes oral care in the dental office (Cermak et al., 2015; Nelson & Webb, 2019). For example, occupational therapists may instruct parents to help their child practice being in a reclined position at home while brushing their teeth (Nelson & Webb, 2019). Also, using a practice exam kit at home may be beneficial because it can help a child become familiar with different sensations that may occur at the dental office (Nelson & Webb, 2019). Visual supports may be used such as a visual clock or social stories in order to help a child understand the length of the dental visit and what events and sensory experiences will occur (Nelson & Webb, 2019). Sensory-adapted dental environment (e.g., soft lighting or providing a weighted blanket) may reduce behavioral distress, pain, physiological stress, and sensory discomfort and ultimately improve oral care at a dental office (Cermak et al., 2015; Nelson & Webb, 2019). These studies imply that occupational therapy can provide a unique contribution to an interdisciplinary team that supports children's oral health (Cermak, 2015; Nelson & Webb, 2019).

Conclusion

In conclusion, oral health education from an interdisciplinary team, including occupational therapists, can positively impact oral health outcomes among children from low-income families. Currently, there is no research within the literature examining the effectiveness of low-income families receiving oral health education from an interdisciplinary team, including occupational therapy. This is an important topic to

research because children from low-socioeconomic status are at risk for poor oral health outcomes, especially dental caries (Hamasha et al., 2006; Peres et al., 2007; Piovesan et al., 2010; WHO, 2020). Furthermore, poor oral health is negatively associated with overall health (WHO, 2020). Fortunately, many oral health diseases can be prevented and treated early (WHO, 2020). Therefore, it is critical to increase families' oral health literacy in order to promote good oral health among children (Khodadadi et al., 2016; Miller et al., 2011; Yazdani et al., 2018). Overall, it is essential for future researchers to look at the benefits of educating low-income families about oral health from an interdisciplinary team in order to support children's oral health.

Literature Review by Taylor Anderson

Oral health is defined as “the ability to speak, smile, smell, taste, touch, chew, swallow, and convey a range of emotions through facial expressions with confidence and without pain, discomfort, and disease of the craniofacial complex” (Glick et al., 2016, para #4). Oral health affects people both psychologically and physically and plays an important influence on quality of life long-term (Glick et al., 2016). Current research regarding oral health discusses the importance of maintaining and creating positive oral health outcomes (Vermaire et al., 2012; Bersell, 2017). Positive oral health outcomes prevent increased expenditures for oral care, prevent primary and secondary conditions, and promote overall good health (Vermaire et al., & Brouwer, 2012; Bersell, 2017). Research also shows that within the United States, oral health isn’t considered a priority compared to overall health and that many individuals overlook oral health and prioritize other areas of health (Bawaskar & Bawaskar, 2020; Mouradian, 2000).

In the United States, dental care is one of the most unmet health needs of children (Fonseca & Avenetti, 2017; Mouradian, 2000). Poor oral health leads to increased cavities, gum disease, cracked or chipped teeth, and sensitive teeth (Li et al., 2000). Poor oral health can also lead to secondary diseases such as cardiovascular disease, bacterial pneumonia, diabetes mellitus, and low birth weight (Bawaskar & Bawaskar, 2020; Li et al., 2000). One out of seven adults (65 or older) have been diagnosed with periodontal diseases due to poor oral health management (Adesanya et al., 2016). Specifically, minority groups and people with a low socioeconomic status are more likely to be populations vulnerable to poor oral health due to lack of funding, causing them to be less likely to receive oral care (Park et al., 2016; Zhang et al., 2013).

Only one in five children, who have Medicaid for insurance, receive preventative oral care (Mouradian, 2000). In addition, if parents don't receive oral health care, carry over of positive oral health habits onto their children won't occur (Guarnizo-Herreño, & Wehby, 2012; Vermaire et al., 2012; Bersell, 2017). Thus, oral health needs are not met for the adult population and they are also not met for the pediatric population (Bersell, 2017; Bawaskar, & Bawaskar, 2020). These conditions and unmet needs for children can become chronic and cause further health and money investment in the future. A study by Ng et al. (2014) found that children who performed good oral hygiene measures showed less secondary health conditions and dental diseases throughout their lifespan. Oral health is a healthcare service that shouldn't be overlooked; however, it can be affected by many outlying factors.

While there are many risk factors contributing to poor oral health outcomes for certain populations, there is also evidence that demonstrates the benefits and importance of oral health. Assessing barriers behind oral health, effectiveness of school-based programs, education to parents, interdisciplinary teams, and opportunities for occupational therapy involvement, are strategies to address this gap of inadequate oral health care. This paper explores whether education to parents (notably those of low social economic status and minority groups) from health care providers supports positive oral health outcomes for children (birth through 18).

Barriers to Oral Health

Barriers often can affect oral health education and decrease follow through from caregivers and children. These barriers can affect children as well as parents in many different ways. Some of these barriers include social determinants of health, previous

exposure, cultural beliefs, values, and attitudes, lifestyle and demographic factors, and family structure.

Social determinants of health were created to assist with and provide guidelines for promoting good health within social and physical environments (Office of Disease Prevention and Health Promotion, 2020). Examples of social determinants of health include socioeconomic status (SES), gender, and culture (race and ethnicity) which all impact an individual's health outcomes (Office of Disease Prevention and Health Promotion, 2020; Fonseca, & Avenetti, 2017). Placement of status in some of these categories can lead to increased barriers to oral health. Some of those can include access to healthcare needs, access to education, and access to funding (Fonseca, & Avenetti, 2017). Social determinants of health also address more than healthcare needs including items such as transportation, education, and housing along with one's access to social and physical opportunities (Office of Disease Prevention and Health Promotion, 2020; Fonseca, & Avenetti, 2017). Limited access to these non-healthcare social determinants of health can lead to barriers to receiving adequate oral health.

Life experiences including previous exposure and cultural and personal beliefs, values, and attitudes are all part of one's experience related to oral health. Previous exposure to adverse oral health experiences can affect a person's beliefs behind proper practices of oral health care throughout their lifespan (Akinkugbe, Hood, & Brickhouse, 2018). For example, a person might have experienced a high amount of pain due to an oral health procedure, causing them to be fearful of going back to receive oral health treatment (Akinkugbe, et al., 2018). Beliefs and traditions also play a role in oral health care. Traditional Chinese culture believes that tooth loss and dental caries (cavities) are

inevitable with old age and that they can't be prevented from having practicing in oral health (Smith et. al, 2013). Smith et al. (2013) reports that the Chinese population often implement home remedies instead of seeking formal dental services due to cost, and these home remedies might worsen oral health issues. Other types of cultures avoid oral health care due to language barriers, difficulty understanding services available for them, and insensitivity to cultural beliefs (Smith et. al, 2013).

Behavior and demographic characteristics of a person and family are also barriers when looking at a person's oral health (Sheiham, 2000). Some of these behavioral and demographic characteristics include diet, hygiene, smoking, alcohol use, stress, and trauma (Sheiham & Watt, 2000). These characteristics can also be influenced by social groups. Children are born into certain demographic categories but learn behaviors as they go through their lifespan.

Parental income and education can also affect a child's oral health status (Kumar et al., 2014). Oral health care can be expensive, especially if a family doesn't have dental insurance, which makes them less likely to have their child seen for oral health care (Azañedo et al., 2017). Without appropriate income, parents might not be able to afford proper oral health care for their children which in turn causes poor oral health outcomes for children (Bersell, 2017). The type of health insurance plan a family has also plays a role in determining access to oral health for children (Azañedo et al., 2017). Reimbursement plans that are publicly and government funded are difficult for families to qualify for (Bersell, 2017). Medicare often only covers dental needs if it is considered a medical procedure (Adesanya et al., 2016).

Parental education and health literacy also play a role in a child's oral health because if a parent has limited education, they might not understand the benefits or needs behind providing their child with good oral health care (Bersell, 2017). Low health literacy also limits a person's ability to access and navigate the oral health care system in order to maximize oral health benefits (Bersell, 2017). Most Americans have difficulty understanding oral health literacy causing limited access to resources for preventative oral health care (Davis & Plaspohl, 2017).

Family structure, family size, and home environment also play a role in the child's oral health (Kumar et al., 2014). Home environments affect a child's oral health as they can promote or hinder good oral health habits and routines. Some families choose to add oral health to part of their daily routines and structure, whereas other families don't promote oral hygiene (Bersell, 2017). Parents play a big role in promoting oral health for children as often times children follow roles and habits their caregiver has created. If oral health is promoted by caregiver routine, the chances are higher that the child will follow the parents' routines by copying what they do. (Kumar et al., 2014). However, if caregivers have had a bad experience with oral health, they often portray those feelings onto their child causing the child to be anxious about oral health (Isong et al., 2011). Family size can also play a role in a child's oral health care as the bigger the family size, the more oral health might cause financial issues which deters parents from promoting good oral health care (Kumar et al., 2014). The ultimate goal for families is to promote healthy social and physical environments for children.

Access to oral health care is another barrier identified affecting a child's oral health outcomes. People living in poverty often work and live in geographically isolated

areas (Bersell, 2017). A geographically isolated area is an area that is a considerable geographical distance from access to the nearest public healthcare facilities and resources (Bersell, 2017). Geographically isolated areas often have a limited number of dentists and Medicaid providers available (Bersell, 2017). As a result, these populations are less likely to receive dental care due to decreased access to providers and medical coverage (Bersell, 2017; Davis & Plaspohl, 2017). Another barrier for children and access to oral health care is parental consent (Calderon et al., 2017). Most states require minors under the age of 12 to have parental consent in order to access oral health care (Calderon et al., 2017). Children often are denied access to healthcare due to the inability of parents to consent care for their child as they are unavailable, unwilling, or unable to (Calderon et al., 2017). Although access to oral health care for children is a barrier, there are many ways in which access to oral health care is promoted to assist children in receiving proper oral health care.

Promoting Access to Oral Health

There are many programs and mechanisms to support and promote oral health for children. School-based programs increase access to oral health care for parents and children with low socio-economic status, decreased access to healthcare, and no dental insurance (Griffin et al., 2016). Oral health programs are available around the world that provide push-in services within schools and allow children to receive dental checkups to increase oral health (Griffin et al., 2016). This isn't always an option as only some children have access to school-based oral health programs which have the ability to serve the child within the school district (Chestnutt, 2014). However, the push into schools provided by school-based oral health programs have shown to improve

pediatric oral health (Chestnutt, 2014). Children are much less likely to develop dental caries when they have access to school-based dental services (Chestnutt, 2014).

School-based programs are an effective strategy to increase access to dental services and improve pediatric oral health.

In addition to dental exams and hygiene activities in schools, education provided from school-based oral health programs are found to be beneficial for parents and children to improve oral health. Some school-based programs provide opportunities for children of all ages to be educated on the importance and value behind proper oral health routines (Griffin et al., 2016). Repetition and reinforcement from school-based programs has been found to be the one of the most beneficial techniques in improving oral health outcomes for children (Haleem et al., 2015; Griffin et al., 2016). Education on oral health within the schools allows staff to become appropriately educated on oral health material (Griffin et al., 2016). This allows carry over in classroom education materials, repetition, and reinforcement from teachers and other personnel within the school as these are the adults that children are interacting with on a daily basis while attending school (Halonen et al., 2013). Education from school-based programs benefit children along with parents and educators regarding positive oral health.

Appropriate and effective parent education can help increase oral health opportunities for children. Parents reported that they want to assist their child in completing brushing activities at least one time a day and willingness to bring their child in for oral health preventative visits more than once a year (Vermaire et al., 2012). Parents are willing to invest money and time on oral health as they value good oral health for their children (Vermaire et al., 2012; Berendsen et al., 2017). However, there

are parents who are unable to invest time and money into their child's oral health outcomes due to many of the social determinants of health and barriers identified which put these children at high risk for dental caries and oral health difficulties (Vermaire et al., 2012). The parents of children at high risk are in greater need of education to support good oral health outcomes.

When educating parents and caregivers on oral health, oral health literacy is an important factor to look at (Bridges et al., 2014). Most Americans have difficulty understanding oral health literacy causing limited access to resources for preventative oral health care (Davis & Plaspohl, 2017). Simple communication from dental providers and primary care providers in an understandable matter helps increase oral health literacy skills for patients which in turn promotes oral health follow through (Horowitz, & Kleinman, 2008). Engaging in patient education about dental care is key to increasing success towards improving oral health (Adesanya et al., 2016). With limitations to oral health literacy, parents look to primary healthcare providers for education regarding their child's oral health (Isong et al., 2011). Often times primary healthcare providers, such as pediatricians, are the only providers children see in earlier years of their life (Davis & Plaspohl, 2017). It is important that primary care providers and oral health interdisciplinary teams relay understandable and proper education to caregivers regarding the benefits and importance of good oral health care for their children.

Interdisciplinary Teams and Oral Health

Interdisciplinary teams provide increased opportunities for education and advocacy that can increase children's oral health (Biordi et al., 2015). Oral health interdisciplinary teams can consist of dentists, physicians, physician assistants, nurse

practitioners, occupational therapists, and other health professionals (Biordi et al., 2015). An interdisciplinary approach towards oral health care helps provide patient centered care, collaboration, and greater patient follow through (Biordi et al., 2015). Research shows that children respond to treatment better when a multidisciplinary approach is taken for their care (Blatt et al., 1997). Advocating for improved oral health by all interdisciplinary team members can decrease overall healthcare costs when looking at general health and oral health (Sheiham, 2000). With an interdisciplinary approach and continued advocacy to oral health care, continued repetition of education to caregivers and children can provide a comprehensive analysis of the benefits and importance behind good oral health practices.

Occupational therapists are an integral part of an interdisciplinary oral health care team. Occupational therapy is a form of rehabilitation which encourages and promotes independence in the performance of daily activities (Occupational Therapy in the Promotion of Health and Well-Being, 2013). One role an occupational therapist can participate in is health promotion and prevention (Pizzi, & Richards, 2017). Oral health fits within the category of health promotion and prevention in which occupational therapists can address (Pizzi, & Richards, 2017). Education to the public by occupational therapists on the importance of good oral health can assist with preventing higher dental costs and preventing oral health concerns (Pizzi, & Richards, 2017).

For children with special healthcare needs, occupational therapy services often address activities of daily living which is a category that oral health falls into (Stein, Polido, & Cermak, 2012). During evaluations, parents often report to occupational therapists that their children have difficulty with completing and participating in oral

health (Stein, Polido, & Cermak, 2012; Stein et al., 2011). These challenges can come from fear or sensory sensitivities (Stein, Polido, & Cermak, 2012; Khrautiego et al., 2020). When parents have difficulty with follow through of oral health with their children, it causes stress on the parents and it increases children's risk for difficulties with eating, sleeping, speaking, and other general health needs (Stein, Polido, & Cermak, 2012). It is an important role of the occupational therapist to address oral health needs with children and caregivers.

Another role occupational therapists can play is providing education to other professionals regarding sensory sensitivities and working with children with special needs (Casamassimo et al., 2004; Bridges et al., 2014). Children with sensory sensitivities can be challenged by the sounds, smells, tastes, touch (vibration and light touch), and lights used in traditional oral health care (Cermak et al., 2015). Occupational therapists are skilled at evaluating sensory sensitivities and supporting children and caregivers with coping strategies to address sensory issues such as deep pressure prior to or during a dental visit and use of sound canceling devices which can prevent or address sensory aversions (Casamassimo et al., 2004).

One final area that occupational therapists address is habits, routines, roles and contextual considerations with children and families (Como et al., 2019). Promoting routines can increase follow through with oral health habits (Como et al., 2019). Occupational therapists can assist and support caregivers and families in integrating oral health into their daily routines and roles. Occupational therapists can adapt environments to reduce fear and increase comfort in the dental environment and also in

the home environment (Cermak et al., 2015). These adaptations can support children's participation in oral health prevention and intervention services.

Conclusion

Oral health is an area of health that is often overlooked by parents and children. When oral health is overlooked, other health problems and areas of oral health concern can occur (Bawaskar, & Bawaskar, 2020). Certain populations such as minority and low socioeconomic status groups are more vulnerable to poor oral health outcomes (Park et al., 2016; Zhang et al., 2013). While there are many barriers that children and families must overcome in order to have proper oral health, research has shown that there are many professionals and services out there who can make a positive impact on oral health for children of all ages (Pizzi, & Richards, 2017; Biordi et al., 2015). Education, promotion, and working with all parts of an interdisciplinary team are ways for children and families to get the access and knowledge that they need to improve children's' oral health outcomes (Como et al., 2019; Biordi et al., 1997; Pizzi, & Richards, 2017; Azañedo et al., 2017).

Literature Review by Emily Bendelsmith

Proper oral healthcare is one of the most common healthcare needs that is unmet in both neurotypical children and children with special needs (Chazin & Glover, 2017; Du et al., 2019). There are a multitude of barriers that affect a child's oral health outcomes such as low socioeconomic status (SES), parent education, cultural values, parent involvement, diet, daily routines, or current health status (Health People 2020, n.d.). One population of children with special needs for whom this is a concern are children with autism spectrum disorder. Autism spectrum disorder (ASD) is defined as, "A developmental disorder that affects communication and behavior" (NIH, 2018). Part of the criteria that coincides with an autism diagnosis is rigid and repetitive patterns and a potential hyper or hypo sensitivity to the environment (American Psychiatric Association, 2013). It is believed that there are multiple barriers that families with a child with autism experience in relation to oral health compared to families with neurotypical children. Parents report that oral routines are often difficult for children with sensory sensitivity, dental fear, and behavioral aggression (Du et al., 2019; Stein, Polido, & Cermak, 2012). There are many concerns when addressing oral health in children with ASD; thus, it is important that healthcare practitioners consider the child, their environment, their behaviors, and their social determinants of health when implementing specific oral interventions.

Social Determinants of Health and Access to Oral Health Care

Social determinants of health are "conditions in the environments in which people are both, live, learn, work, play worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" (Healthy People 2020, n.d.). In other

words, much of health is determined by physical, social, and economic access to care. Access to clean water and air, nutritional food, housing, employment, healthcare, education, and transportation are each examples of social determinants of health that play a role in oral health outcomes (Health People 2020, n.d.). In addition, race/ethnicity, disability status, SES, cultural norms, and location affect oral health outcomes (Chazin & Glover, 2017). Disability status often impacts one's quality of life and access to community services, such as employment, education, healthcare, housing and social/community participation (Health People 2020, n.d.). Disabilities, including autism, are impacted by social determinants of health, which then influence healthcare access, such as oral health care (Bishop-Fitzpatrick & Kind, 2017). When there is a lack of access to oral health care, poor oral health outcomes, such as early childhood caries and other oral health diseases may develop (Edelstein et al., 2016). There is a strong relationship between social determinants of health and early childhood caries, which is the decay of baby teeth (Edelstein et al., 2016). There are a variety of factors that play a role in a child's oral health status, and it is crucial that providers work to eliminate these disparities and barriers by providing accessible services to all clients (Edelstein et al., 2016).

While addressing these oral health disparities, it is also important to consider how cultural values, beliefs, and attitudes influence oral health. Immigrants and ethnic minority groups are at risk for dental caries, also known as tooth decay (Finnegan et al., 2016). Some of the factors that contribute to this risk are attitudes about baby teeth, at-home dental routines, poor prior dental experience, oral health literacy, and insurance coverage (Finnegan et al., 2016).

Access to healthcare may be difficult for all families with children with ASD, as it is significantly more difficult to receive healthcare services for families of color that have children with ASD (Bishop-Fitzpatrick & Kind, 2017). Although there is very little research specifically on ASD, race, and oral health disparities, Bishop-Fitzpatrick and Kind (2017) note that families of color with children with ASD experience greater healthcare disparities compared to white families. Black and Latinx children with ASD often get a later diagnosis than their white peers, and they have less access to appropriate treatment and care (Bishop-Fitzpatrick & Kind, 2017). Black and Latinx families with children with ASD are less likely to have access to a personal doctor or nurse (Bishop-Fitzpatrick & Kind, 2017; Magana et al., 2012). Compared to white families with a child with ASD, Black and Latinx families also report that their doctor does not spend a sufficient amount of time with them and there is a lack of an opportunity to partner with the doctor (Bishop-Fitzpatrick & Kind, 2017; Magana et al., 2012).

Based on these studies focused on healthcare access, it is clear that there is a racial and ethnic disparity in families of color, especially Black and Latinx Families with a child with autism. Families with children with ASD will have a variety of cultural beliefs, practices, and barriers related to oral health, such as concerns related to immigration status, insurance coverage, and home oral routines, like the use of at-home oral solution of baking soda (Florindez et al., 2019). Based on these results, it will be important for future research to focus on how racial and ethnic disparities and cultural values impact oral health care and access for families of color with a child with ASD, as it is crucial to understand how access impacts overall oral health outcomes.

Barriers and Strategies to Address Oral Health Care for Families of Children with Autism

In addition to the racial and ethnic disparities seen in healthcare access for families of color with children with ASD, there are barriers that all families with children with autism face that are specific and unique barriers related to oral health care due to the child's sensory and behavioral responses (Chandrashekhar & Bommangoudar, 2018; Stein et al., 2012). According to Gandhi and Klein (2014), 12% of children with ASD had unmet dental needs due to barriers. There are a multitude of factors that influence oral health care for all families, but families with children with ASD appear to experience more unique oral experience that impact their oral health outcomes when compared to families with neurotypical children (Stein et al., 2012). Many of these barriers are related to sensory needs, environmental barriers, and behavioral challenges (Chandrashekhar & Bommangoudar, 2018; Stein et al., 2012).

Sensory and Environmental Barriers

Sensory integration is defined as “the organization of sensory input for use. The ‘use’ may be a perception of the body or the world, an adaptive response, a learning process, or the development of some neural function” (Ayres, 2005, p. 201). Sensory integration and processing in children with ASD often look different than it does in neurotypical children. A child with ASD may be over or under sensitive to their environment, which can significantly impact the child's processing, behavior, and interactions with their environment (Stein et al., 2012). According to Stein et al. (2012), families who have children with autism report greater difficulty with oral care, specifically due to sensory-related factors. This sensory response occurs both within the dental

room and home environment (Stein et al., 2012). There are multiple sensory barriers within the home for children with ASD such as children's discomfort with the texture of toothpaste or having a toothbrush in their mouth (Stein et al., 2012). There may be some sensory defensiveness, which is when a child is over-responsive to the environment (i.e. certain types of touch or noises), to the bristles of the toothbrush or the pressure of the toothbrush in the mouth (Stein et al., 2012). Children with autism may perceive the taste or "foamy" texture of toothpaste or the temperature of the water as uncomfortable (British Society of Paediatric Dentistry, n.d.).

In addition to sensory-related difficulty at home, the environment for a dental treatment room can be a barrier for a child. There is a relationship between the dental room environment and the child's response to dental care, including the various sensory experience within a treatment room (Cermak et al., 2015; Stein et al., 2012). The dental environment may include bright lights, loud sounds (i.e. drilling), odors, uncomfortable tastes and feelings in the mouth, and negative vestibular experiences (i.e. leaning back in the dental chair) (Stein et al., 2012). These negative sensory experiences are not only uncomfortable for patients, but can also elicit strong behavioral responses and fear (Kuhaneck & Chisolm, 2012). In order to address these sensory concerns, the oral health team must collaborate to create sensory-friendly environments for children with autism to promote emotional regulation when receiving dental care with the purpose of improving overall oral health care (Cermak et al., 2015; Chandrashekhar & Bommangoudar, 2018).

Sensory Strategies

In order to reduce adverse responses and increase oral health in children with autism, it is crucial to consider the effects of the dental environment (Cermak et al., 2015; Stein et al., 2012). A sensory adapted dental environment could include darkened curtains and no fluorescent lights, visual effects on the ceiling, rhythmic music, and a weighted butterfly on the chair that wrapped around the child's shoulders and ankles (Cermak et al., 2015). It was found that with a sensory adapted environment, physiological distress decreased, fewer restraints were needed, and no anesthesia was needed (Cermak et al., 2015). Families and oral health care workers can implement sensory strategies proactively to promote effective dental routines and oral health outcomes (Miller-Kuhaneck, n.d.). For example, the STAR Institute suggests the use of providing vibration (i.e. electric toothbrushes) within the oral cavity, eating something chewy prior to the appointment, providing a fidget during the appointment, wearing headphones, and/or wearing sunglasses during the appointment (Miller-Kuhaneck, n.d.). The purpose of offering these strategies before or during the appointment is to calm the child's body and keep them regulated for their dental session (Miller-Kuhaneck, n.d.).

In addition to strategies to support participation in oral cares in the clinic setting, there are strategies to support oral hygiene in the home. Home strategies that have been found to be successful include providing deep pressure through hugs or weighted items before oral cares at home, applying pressure to the mouth and gums, using a mildly flavored toothpaste, using a vibrating or electric toothbrush, and/or standing behind the children to promote body awareness and balance during the tooth brushing routine (Cambridgeshire Community Services, 2018). A sensory adapted environment

may improve the behaviors in children with ASD, thus improving oral health outcomes (Cermak et al., 2015).

Behavioral Barriers

The dental environment is very important for a child with autism, and research demonstrates a strong relationship between sensory and behavioral responses in children with autism, which are frequently exhibited within their oral health experiences (Stein et al., 2014). Children with ASD may experience aggressive or uncooperative behaviors, which greatly impact their overall access to oral health care (Stein et al., 2014). Strong behavioral responses can negatively affect access to oral health because it influences dental practitioners and their willingness to treat kids with “aggressive” behaviors (Weil & Inglehart, 2010). Dental care workers are often unaware or unequipped to manage these behaviors, and many dental practitioners report their discomfort working with children with special needs (Weil & Inglehart, 2010).

There may be multiple factors impacting a behavioral response such as a change in routine, exposure to an unfamiliar setting, or negative sensory experiences within the environment (Gandhi & Klein, 2014). This may result in emotional outbursts, refusal, and aggression toward objects, others, or self (Gandhi & Klein, 2014). Self-injurious behaviors may occur as a result of being unable to communicate pain, and examples of this behavior may include injury to the child’s gums, cheek/lip biting, and self-extraction of the tooth (Ghandi & Klein, 2014). Visiting the dentist is often a traumatic experience for children with autism, and parents report that they want less use of restraints and more strategies to help support their child’s experience by making it less stressful for both the parent and the child (Lewis et al., 2015). It is important for oral healthcare

workers to be educated and trained on how to approach these behaviors, and as a result develop strategies that support the patient's regulation, behavior, and dental experience (Stein et al., 2014; Weil & Inglehart, 2010).

Behavioral Strategies

While parents with children with autism report a difficulty in implementing oral health routines and hygiene into everyday life, there are effective strategies to promote this implementation, such as behavioral management strategies (Duijster et al., 2015; Gandhi & Klein, 2014). Behavior management strategies such as visuals, preventative strategies, and reward systems are often helpful in creating oral routines at home for children with autism (Chandrashekhar & Bommangoudar, 2018; de Jong-Lenters et al., 2019). de Jong-Lenters et al. (2019), argues that the use of stimulus control and operational conditioning can be beneficial in creating positive oral health behaviors. Operant conditioning refers to a behavioral strategy in which positive behaviors are reinforced and negative behaviors are extinguished (de-Jong-Lenters et al., 2019). Examples of positive reinforcement at home include positive praise, rewards of stickers or toys, and making tooth brushing a fun activity by singing songs, counting along, or using visuals (Duijster et al., 2015).

Within the dental environment, dental practitioners may use communication devices, narration, social stories, and other adaptive techniques to support client behavior and promote positive oral health outcomes (Chandrashekhar & Bommangoudar, 2018; Kuhaneck & Chislolm, 2012). To promote client behavior, the use of distractions, such as watching a movie, listening to music, or holding onto a toy, are useful in eliciting regulation and preventing behavioral responses within the dental

environment (Chandrashekhara & Bommangoudar, 2018). Effective communication is important in building trust between clients and providers, so when working with clients with ASD, the use of short, clear, and ongoing communication is useful (Chandrashekhara & Bommangoudar, 2018). The use of a communication strategy, such as a Picture Exchange Communication System (PECS) can be used with patients with little verbal communication to allow the child to communicate their wants and needs through pictures (Chandrashekhara & Bommangoudar, 2018). Social stories are a visual short story or description of an event that is used to help the child become familiar and prepared for the event (Chandrashekhara & Bommangoudar, 2018). This can be used in a dental setting by helping the client become familiar with the sequencing and expectations of a dental cleaning through visual learning (Chandrashekhara & Bommangoudar, 2018). The use of distractions, such as watching a movie, listening to music, or holding onto a toy, are useful in eliciting regulation and preventing behavioral responses within the dental environment (Chandrashekhara & Bommangoudar, 2018).

Trauma-Informed Care

Compared to neurotypical children, children with autism are generally more likely to experience anxiety, sensory sensitivity, and dental fear; thus, healthcare professionals must provide trauma-informed care, with an emphasis on sensory-friendly care, to prevent dental stress for their clients (Bradbury-Jones et al., 2019; Isong et al., 2014; Stein et al., 2014). Children with autism are often fearful of dental procedures, and they are more likely to receive sedation or anesthesia during procedures, which places them at risk for complications (Isong et al., 2014). Additionally, many children with ASD have fear associated with a dental environment due to sensory-related issues,

such as the noise or dislike of being touched (Stein et al., 2014). According to Stein et al. (2014), parents of children with ASD have expressed that dental experiences with their child are often negative and distressing.

All community health partners should receive education and training on trauma-informed care for their clients in order to appropriately recognize, respond to, and respect the clients who have experienced traumatic events (Bradbury-Jones et al., 2019; Isong et al., 2014). While children with ASD are susceptible to dental fear, anxiety, and potentially trauma, it is important to educate and train oral health professionals on responding to all types of trauma, including those of typically developing children (Bradbury-Jones et al., 2019). Hammett, Altman, Severin, Stillerman, and Villanueva (2019) stress the importance of providing care that promotes healing and prevents re-traumatization. In order to provide trauma-informed care, the provider must realize the impact of trauma, recognize what trauma looks like, respond to the trauma appropriately, and resist re-traumatization (Hammett et al., 2019). Patients and families are active members in the treatment plan and providers are sensitive about making their client feel as comfortable and safe as possible through environment modifications (i.e. dim lights) (Hammett et al., 2019). Trauma-informed care can be implemented with neurotypical clients and clients with special needs; however, trauma-informed interventions may look different for clients with ASD. There is a special emphasis on creating sensory friendly dental environments to decrease dental fear/anxiety in children with ASD, as sensory adapted environments work to regulate the child and their body in response to dental anxiety (Stein et al., 2014).

Parental Styles and Education

Parenting styles, attitudes, and oral health literacy influences a child's oral hygiene, oral behaviors, and overall oral health outcomes (Duijster et al., 2015; Howenstein et al., 2015; Renzaho & de Silva-Sanigorski, 2013). Early childhood caries is very common in young children, yet many caregivers are unaware of how preventable caries are and the ways in which dental caries can be prevented (Duijster et al., 2015). In a focus group research, Duijster et al. (2015), found a relationship between locus of control and a child's oral health. Some caregivers believe that there are uncontrollable factors, such as genes or experiences that influence their child's risk for poor oral health outcomes. Caregivers also report not feeling confident in oral health knowledge, especially when providers give complex advice, and some caregivers were unsure of what were considered healthy foods for their children (Duijster et al., 2015). In addition to caregiver knowledge, personal factors can become a barrier, including not wanting to expend energy on debating with their kids about tooth brushing, busy schedules, fatigue, and stress (de Jong-Lenters et al., 2015).

Caregiver styles and attitudes also play a significant role in impacting child oral health through the child's diet, emotional regulation, social skills, and behaviors, which as result impacts the child's responses in a dental environment (Howenstein et al., 2015). Howenstein et al. (2015) researched 3 different parenting styles, authoritative (high control, low warmth), authoritarian (high control, high warmth) and permissive parents (low control, high warmth) and its relationship to their child's oral health. Children with authoritative parents and structured environments demonstrated more positive behaviors and fewer dental caries compared to children with authoritarian and permissive caregivers or environments with less structure and routines (de Jong-

Lenters, 2015; Howenstein, 2015). It is believed that these results are consistent with other psychological research, as it has been supported that children with authoritative caregivers tend to have high emotional control and improved social skills, which would account for positive behaviors seen in a dental office (Howenstein et al., 2015).

Additionally, authoritative caregivers may be stricter on diet and rules associated with teeth brushing, which positively influences a child's oral health.

In addition to parenting style, caregiver stress and family dysfunction negatively impacts the child's oral health outcomes (Renzaho & de Silva Sanigorski, 2013). There is a relationship between parental mental health disorders and poor oral health outcomes (Renzaho & de Silva Sanigorski, 2013). Family dysfunction, which is defined as, "high levels of conflict, disorganization and affective and behavioral control," is associated with a child's oral health (Renzaho & de Silva Sanigorski, 2013, p. 549). Social and psychological factors play a significant role in the family as well as the child's engagement in proper oral health. When addressing caregiver involvement in the child's oral health, healthcare workers must be considerate of the family functioning, caregiver mental health, and social supports available to the family (Renzaho & de Silva Sanigorski, 2013).

Caregiver Strategies

Caregiver education is crucial in community health to inform and involve parents while also promoting the child's overall health (Duijster et al., 2015; de Jong-Lenters et al., 2019; Finnegan et al., 2016). Caregivers with children with autism may benefit from improving their oral health literacy to better understand the importance of oral health and learn how to implement strategies with their children (Chandrashekhar &

Bommangoudar, 2018). To address basic oral health knowledge, the use of workshops and presentations on oral health have demonstrated an increase in caregiver competency in oral health (Abdallah et al., 2018). It is also important for an oral health team to collaborate with caregivers to help them develop strategies for their child, such as giving the parent a social story to help prepare their child for a dental visit (Chandrashekhar & Bommangoudar, 2018). Oral health providers can involve the parent in choosing sensory and behavioral strategies to help develop individual treatment plans for the child and help educate the parents on how to utilize these strategies (Chandrashekhar & Bommangoudar, 2018).

Parent education and resources need to be accessible for all families in order for families to understand, be involved, and create strategies in home that improve their child's oral health (Duijster et al., 2015; de Jong-Lenters et al. 2019). Oral health providers need to consider cultural considerations, such as language, attitudes, values, and experiences when providing education to families to make it accessible for all members of the community (Finnegan et al., 2016; Floríndez et al., 2019). Oral health literacy programs should be individualized for groups to ensure that the group is receiving culturally relevant and accessible information; for example, in adult classes for immigrants and refugees, an education on oral health could help reduce the risk of dental caries in their children (Finnegan et al., 2016). When considering the intersectionality of culture, autism, and oral health attitudes, oral health providers should be sensitive to the family's experiences and attitudes while providing culturally relevant tools and services to the family (Floríndez et al., 2019).

Multidisciplinary Collaboration and Strategies to Improve Oral Health Care and Services

In order to meet the needs of all clients, including clients with autism, the collaborative team should take a population-based model approach, in which the healthcare team provides accountable care to its clients and their families (Chazin & Glover, 2017; Edelstein, 2018). A population-based model approach refers to addressing the social issues that play a role in early childhood caries by focusing on the communities or populations affected by these social factors (Edelstein, 2018). Edelstein (2018) argues that the most effective way to address poor oral health outcomes is to focus on high-risk clients, start interventions early, create a multidisciplinary team, and educate and involve caregivers. In order to involve caregivers, providers must provide culturally relevant care, accessible care, and allocation of resources (Edelstein, 2018). While this collaborative approach does not specifically address families with children with autism, many children with autism fall into the high-risk client category making it a likely model to use as an approach (Bishop-Fitzpatrick & Kind, 2017). Thus, this community-based approach will be inclusive of all families impacted by social determinants of health as healthcare workers continue to reduce risks and provide accessible and relevant care to their clients (Chazin & Glover, 2017).

Multidisciplinary care is an effective approach to treating oral health problems for children with autism as its collaboration creates accessible and sensory-friendly care for its clients (Chazin & Glover, 2017; Edelstein, 2018, Stein et al., 2012). There are many factors that influence a child's oral health including biological, psychological, social, and environmental; thus, it is crucial to have health care workers from different fields in order

to address the various factors playing a role in the child's oral health (Edelstein, 2018). A multidisciplinary team can utilize the strengths of each team member to effectively and holistically address the oral health of a child with autism by addressing each factor that may play a role in the child's oral health behaviors and outcomes (Bono et al., 2019).

Oral hygiene is an important activity of daily living, and occupational therapists are able to use their special training on sensory strategies and routine building to address the unique needs of children in order to promote positive oral health outcomes in a multidisciplinary capacity (Bono et al., 2019; Stein et al., 2012). Occupational therapists have a unique position of training other oral healthcare professionals on the relationship between sensory integration and oral health behaviors, which is often seen in oral health (Stein et al., 2012). Occupational therapists are educated, trained, and skilled in understanding how sensory integration (the way in which our bodies process and respond to sensory information) impacts our ability to function and engage in everyday activities (AOTA, 2017). Since occupational therapists receive this unique training, they provide a valuable asset to an oral health team through addressing sensory concerns, adapting tasks or environments, and educating other professionals and families (AOTA, 2017; Stein et al., 2012). In addition to their knowledge and skills in sensory processing, occupational therapists can also use their professional skills to promote daily oral hygiene routines, behavior management techniques, and collaborating with other professionals to address and implement trauma-informed care (Bono et al., 2019).

Conclusion

Oral health is a complex care setting, but currently oral health needs are not being met in both neurotypical children and children with autism (Chazin & Glover, 2017; Du et al., 2019). There are a variety of factors that play a role in one's oral health status, including social determinants of health, cultural background, dental care access, and parental involvement (Chazin & Glover, 2017; Finnegan et al., 2016; Florindez et al., 2019; Healthy People 2020, n.d.; Magana et al., 2012). Children with autism face unique barriers in oral health care related to sensory, emotional, and behavioral responses (Cermak et al., 2015; Gandhi & Klein, 2014; Stein et al., 2012; Stein et al., 2014). In order to address these specific barriers, multidisciplinary teams must work cohesively to address oral health care concerns with trauma-informed care, culturally relevant tools, provide accessible care to families, education and train caregivers and create sensory friendly environments and modifications to promote positive behavioral responses to oral care with the hopes of increasing oral health outcomes in children with ASD (Cermak et al., 2015; Gandhi & Klein, 2014; Kuhanek & Chisolm, 2012; Hammett et al., 2019; Stein et al., 2012; Stein et al., 2014).

Literature Review by Brittane Despres

Introduction

A person's oral health greatly impacts their overall health and wellbeing, yet the value of oral health education does not receive the attention it deserves. Research shows that health literacy plays an important role in oral health (Geltman et al., 2013; Kaur, Kandelman, & Potvin, 2019). Health literacy refers to an individual's capacity to obtain, process, and understand basic health information and services (Geltman et. al, 2013). Furthermore, oral health literacy has emerged as a potential pathway to reduce oral health disparities (Kaur et al., 2019). When a person does not have adequate health literacy, it has been associated with a long and growing list of adverse health outcomes, which includes limited access and utilization of care, poor clinical outcomes, more hospitalizations, and higher mortality rates (Geltman et al., 2013). Regarding specific oral health disparities, pain and tooth loss have been shown to compromise normal eating and negatively impact nutrition, school attendance, socialization, self-esteem, speech, and overall quality of life (Kizito, Meredith, Wang, Kasangaki, & Macnab, 2014).

The Office of Disease Prevention and Health Promotion (2020) relates many of these issues to social determinants of health. Social determinants of health are "conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks" (Office of Disease Prevention and Health Promotion, 2020, Understanding Social Determinants of Health, para.1). Unfortunately, not all people have the same conditions in which to live. An initiative to help combat these disparities

is called Healthy People 2020 (Office of Disease Prevention and Health Promotion, 2020). Economic stability, education, social and community context, health and health care, and neighborhood and built environments are all important factors (Office of Disease Prevention and Health Promotion, 2020). Making improvements in these areas would create better oral health and overall health for everyone, particularly for more vulnerable populations.

Included in the vulnerable populations are children and families of lower socioeconomic status. Socioeconomic status (SES) can have a major impact on oral health (Brown, Canham, & Cureton, 2005). Research shows that strategies to improve oral health and overall health of vulnerable populations includes educating families, caregivers, and health professionals as well as creating community and school-based programming using an interdisciplinary approach (Collins, Divaris, Zeldin, Sams, & Villa-Torres, 2017; Taveras, LaPelle, Gupta, & Finkelstein, 2006).

Impact of Socioeconomic Status

Socioeconomic status not only effects a child's overall health, but it impacts their oral health as well (Brown et al., 2005; Chi, Masterson, Carle, Mancl, & Coldwell, 2014; Collins, et al., 2017; Gold & Tomar, 2018). Low socioeconomic status is related to lower oral health and general health (Brown et al., 2005). Low-income parents of young children are faced with daily life struggles such as financial constraints, access to oral health care, and obtaining proper health insurance that all interfere with oral health care that middle and high socioeconomic status families do not face (Collins, et al., 2017). Improving oral health for children and families first must begin with realizing what populations are affected most, such as those of lower socioeconomic status.

In a 2014 study by Chi and colleagues, they found that food security, dental caries, and higher socioeconomic status were associated with a significantly lower prevalence of dental caries. Additionally, children that came from households with low or very low food security had significantly higher prevalence of dental caries (Chi, et al., 2014). These trends could be related to disparities in access to dental care for low SES families. Another study regarding socioeconomic status and dental health found that women in the WIC program (Special Supplemental Nutrition Program for Women, Infants, and Children) had unmet dental needs including caries and preventative services but did not qualify for Medicaid (Gold & Tomar, 2018). For many of the children in the WIC study, their first visit to a dentist was after joining the program (Gold & Tomar, 2018). Another staggering fact from the study is that the dental caries prevalence among the 3-5-year old children in the WIC program was 42%, which is two times higher than the Healthy People 2020 target of 21.4% (Gold & Tomar, 2018; Office of Disease Prevention and Health Promotion, 2020). Statistics like these show the devastating impact of oral health faced by those of lower socioeconomic status.

Barriers Faced by Immigrants

One population group disproportionately impacted by lower levels socioeconomic status is immigrants. Research has shown that many immigrants have lower socioeconomic status and disproportionate access to dental care as well as lower oral health literacy (Geltman, et al., 2013; Okunseri, Hodges, & Born, 2008). A study by Kaur et al. (2019) found that immigrants have higher rates of oral diseases, poorer access to dental care services, and lower levels of health literacy. Additionally, one must consider the oral care and services available prior to coming to the United States. Due to a

combination of untreated oral diseases prior to immigration as well as the presence of multiple barriers to good oral health, refugees and immigrants are among the populations at the highest risk of poor oral health (Brown, et al., 2005).

One specific cultural group that is highly prevalent in the Twin Cities metro area that seems to be greatly affected by low socioeconomic status and oral health outcomes are Somali immigrants. Somali immigrants with lower socioeconomic status face many barriers to receiving oral health care for themselves and their children (Geltman, et al., 2013; Adams, et al., 2013; Okunseri, Hodges, & Born, 2008). Somali immigrants' worsening oral health may be linked to less access to preventative care and less utilization of beneficial oral hygiene practices (Geltman, et al., 2013). In a study of Somali adult immigrants' oral health and access to dental care, a substantial portion of those asked rated their oral health and access as poor or fair (Okunseri, et al., 2008). There are several reasons besides socioeconomic class issues that may be linked to lower levels of access and utilization by Somali immigrants and some of them appear to be tied to cultural ties and their implications.

One aspect of understanding factors linked to oral health outcomes for the Somali population is an understanding of Somali oral health practices (Okunseri, et al., 2008). The underlying model for oral health care within the Somali population remains rooted in Islam (Adams, et al., 2013). This may include use of a Miswak. A Miswak is a teeth cleaning twig made from a tree (Adams, et al, 2013). After immigration to the United States, many Somali families' oral health practices changed and adapted to U.S. practices because of access and availability to products and services but they still value the Islamic traditions (Adams, et al., 2013). In order to help the transition to U.S.

practices, it is important to create an environment that offers minimal language and cultural barriers (Brown, et al., 2005). When working with a predominately immigrant population, it is important to demonstrate a respect for cultural beliefs, engage in conversations to learn about their current practices, and then offer education on oral health care to improve health literacy for themselves and their children.

Methods for Improving Oral Health Outcomes

Educating caregivers about oral health is a critical step to improving oral care, health literacy, and overall health promotion (Collins, et al., 2017; Gold & Tomar, 2018; Taveras, et al., 2006). According to Collins and colleagues (2017), interventions aimed to improve children's oral health must take into consideration the role of families and the communities in which they live. The outcome would likely be different in a community with a lower socioeconomic status and immigrant populations versus a community with higher socioeconomic status where the families have better access to care and higher health literacy.

Engaging in education of professionals in community organizations and services may be another way to increase oral health outcomes for children. For instance, Taveras et al. (2006) found that partnering with childcare facilities would allow professional growth of the childcare providers to serve in a health promotion role in addition to their childcare role. Furthermore, a study involving WIC programs highlights the impact workers can have by providing health services and resources to children and mothers (Gold & Tomar, 2018). Specifically, WIC achieves this through promoting oral health education, connecting underserved populations to preventative dental services, and improving access to dental care (Gold & Tomar, 2018). Through partnership with

community organizations, oral health care workers can educate professionals from other health or care disciplines to reach populations who currently have less access to dental care services.

School-Based Oral Health Programs

Another way to reach populations with less access to dental care services is to provide services in school settings (Freeman, et al., 2016). School-based oral health programs have shown effective and positive results in reaching underserved populations (Albert, McManus, & Mitchell, 2005; Mason, Gargano, Kumar, & Northridge, 2019; Spencer, Hood, Agboola, & Pritchard, 2018; Woodall, Woodward, Witty, & McCulloch, 2014). “Schools offer the opportunity to reach a large proportion of the global population and can be instrumental in shaping children’s health related beliefs, attitudes, values and behaviours,” (Woodall, et al., 2014, p. 415).

While schools have the opportunity to reach the largest number of children in need of oral health services, funding could be a concern. Government funding is available to develop and implement school-based oral health programs in communities of need (Mason, et al., 2019). One such program that provides screenings to determine the need for dental care and preventative services is funded through Federally Qualified Health Centers (FQHCs) (Mason, et al., 2019). FQHCs provide health care services in geographic areas with limited health care providers and are supported through a grant established by the Public Health Service Act of 1944 (Mason, et al., 2019). Other funding resources can include local health departments, hospitals and medical centers, community health centers, community-based organizations, and private not-for-profit social service agencies (Albert, et al., 2005).

To make any school-based oral health program as successful as possible, there needs to be support and participation from school staff. In a study of a toothbrushing program tested at schools which provided toothbrushes, floss, and carrying cases, the results indicated that success was dependent on committed and consistent staff (Woodall, et al., 2014). Similarly, Albert and colleagues (2005) found that successful school-based models always include a positive relationship with school administrators, teachers, other teaching staff, parents, children, and clinical professionals (Freeman, et al., 2016).

Along with support of school staff, parents also need to be involved with the interventions in order for them to be effective. Spencer and colleagues (2018) found that parents and the home environment are instrumental in supporting positive health outcomes. However, parents may face many cultural, personal, or financial barriers that limit their participation (Brown, et al., 2005). To minimize the barriers, having active and consistent consultation and engagement with parents with a one-on-one support worker supported parent and child involvement in school oral health programming (Spencer, et al., 2018). Due to the findings related to the need for a collaborative effort to make school-based programs a success, an interdisciplinary approach may be a useful mechanism for supporting oral health services and education.

Utilization of an Interdisciplinary Approach

An interdisciplinary approach can provide necessary interventions to help meet oral care needs of underserved populations (Collins, et al, 2017; Gold & Tomar, 2018; Kaur, et al., 2019). An interdisciplinary team that focuses on oral health could include dental, nursing, medical, physician assistants and other health program professionals

(Gold & Tomar, 2018). An example of a successful interdisciplinary approach involving underserved populations is the WIC program. The “WIC program is one of the largest providers of health services for low-income, young children, who are at high risk for developing dental decay,” (Gold & Tomar, 2018, p. 1621). The program utilizes interdisciplinary collaboration between non-dental staff of the WIC program and oral health professionals in the community to improve the oral health and prevent dental diseases of pregnant mothers and mothers with young children by providing oral health education that stresses the importance of oral health, good oral hygiene habits, and a healthy nutritional diet (Gold & Tomar, 2018).

Creating community partnerships can be an essential part of interdisciplinary collaboration and meeting the needs of the underserved populations (Gold & Tomar, 2018). Research by Collins and colleagues (2017) found that community programs and organizations emerged as promising avenues for gaining support and sharing resources for oral health care. A similar study revealed that community collaboration involving vulnerable group populations with low levels of oral health literacy can improve oral hygiene self-care behavior, as evidenced by the Safeguard Your Smile (SYS) intervention, which is an oral health literacy intervention program (Kaur, 2019).

Occupational Therapy’s Role in Oral Health

An occupational therapist could be part of an interdisciplinary team to help improve oral health and health promotion by utilizing a variety of strategies (Cermak, et al., 2015; Collins, et al., 2017; Kaur, et al., 2019). In the dental clinic setting, an occupational therapist could suggest strategies to help children that are scared of procedures or cleanings or that have aversions to sounds, smells, sights, or feelings

during a dental visit. By offering education on sensory modifications and calming strategies to dentists, occupational therapists can help improve patients' dental experiences (Cermak, et al., 2015).

Another area of focus for occupational therapists is helping people build the activities they want and need to do into their daily routine while considering environmental, personal, and cultural factors. A study by Kaur and colleagues (2019) found that by first modeling appropriate tooth brushing, flossing and tongue cleaning and then helping participants make a concrete plan to implement the steps by building them into a daily routine had positive outcomes. Results from the study showed that those who completed the program had less plaque, higher oral health literacy, and better oral health behaviors, stressing the importance of routines (Kaur, et al., 2019). A similar study found that establishment of rules and routines and commitment to them was a successful strategy to promote children's oral health (Collins, et al., 2017). According to Occupational Therapy Practice Framework, working with individuals, groups, and populations related to establishing and promoting routines, habits, and roles to successfully implement health and wellness behaviors into their lives is within occupational therapy's scope of practice, so it is fitting that it be addressed in holistic care to promote children's oral health (AOTA, 2020a).

Conclusion

Improving oral health is a complex task. There is currently a lack of education, lack of access to services, and lack of financial resources for both children and adults (Adams, et al., 2013; Brown, et al., 2005; Kaur, et al, 2019). A first step to improving oral health is increasing oral health literacy, especially for vulnerable populations

(Geltman, et al., 2013; Kaur, et al., 2019). Besides low health literacy, another major barrier is a person or group's socioeconomic status (Collins, et al., 2017). This factor is heightened for those that are also immigrants, as they not only face financial barriers, but cultural and language barriers as well (Brown, et al., 2005). Methods for improving oral health outcomes include parent education and school-based programming utilizing an interdisciplinary approach (Collins, et al., 2017; Gold & Tomar, 2018; Taveras, et al., 2006). Occupational therapists can be key players in the multifaceted approach, as they specialize in building strategies into daily routines by using client-centered care that focuses on a person's needs, while considering the environment and other contexts (Cermak, et al, 2015; Collins, et al., 2017).

Literature Review by Colin Howe

Early childhood caries (ECC), or dental cavities, is the most common chronic disease of childhood affecting approximately half of children 11-years old and younger in the United States (Martin et al., 2018). ECC is more than a temporary nuisance for children and families. Dental caries lead to a variety of short- and long-term physical and psychosocial problems including pain, school absenteeism, concentration issues, obesity, cardiac and respiratory issues, diabetes, and poor oral health as an adult (Abou El Fadl et al., 2016; Mahat & Bowen, 2017). The United States Department of Health and Human Services (USDHHS, 2020) *Healthy People 2030* initiative includes pediatric oral health in its ten-year vision to improve national health.

Despite seemingly simple solutions, it's been difficult to improve pediatric oral health. Since the mid-1990s, ECC prevalence in the US increased, especially among children 2-11 years old (USDHHS, n.d.). In response, public health initiatives promote earlier adoption of preventive oral health behaviors and target caregiver education (Martin et al., 2018). Caregivers are essential in establishing positive pediatric oral health behaviors such as seeking dental care for their child and establishing healthy lifestyle decisions and behaviors within the home (Divaris et al., 2012). The family environment largely determines pediatric oral health and caregivers' critical role in daily routines directly translates to children's oral health (Collins et al., 2016). However, financial and time constraints as well as barriers to affordable services hinder proposed self-management strategies in low SES families (Collins et al., 2016). Caregivers with lower levels of SES and oral health knowledge are correlated with lower adherence to oral health behaviors (Divaris et al., 2012). Public health needs new strategies that

address barriers within homes and communities to improve pediatric oral health outcomes for low SES populations. This paper considers caregiver education strategies that may increase the effectiveness of pediatric oral health in low SES communities.

Pediatric Oral Health Disparities in Low Socioeconomic Communities

ECC is distinct among chronic conditions due to its preventable etiology (Wilson et al., 2016). Onset of ECC is influenced by a range of factors such as healthcare access and affordability, availability of nutritious food options, and daily oral health habits (Martin et al., 2018). The American Academy of Pediatric Dentistry (AAPD, 2013) assert ECC is entirely preventable if caregivers implement effective self-management strategies including consistent preventive dental care and daily oral hygiene habits.

SES is a multifactorial construct that considers income, education, financial security, and subjective perceptions of social class and quality of life (American Psychological Association [APA], 2017). Lower SES correlates with social determinants of health such as lower income, lower education, and non-white racial and ethnic groups that experience disproportionate ECC prevalence (Martin et al., 2018). To illustrate, ECC affect 37% of primary, or “baby”, teeth in children two to eight years old (Nelson et al., 2017). However, Hispanic and Black children are more likely to experience ECC than non-Hispanic white children (46% and 44% vs 31%) (Nelson et al., 2017). Additionally, more than 80% of ECC disease burden affects lower SES, minority, and/or Medicaid-insured populations (Martin et al., 2018).

Despite ECC prevalence, preventative services are underutilized. Twenty-five percent of children from low SES families have not seen a dentist before entering kindergarten, and often their first dental visit is due to noticeable, painful caries (Biordi

et al., 2015; Divaris et al., 2012). Limited access to preventative care is due in part to a shortage of dentists who treat children and accept Medicaid insurance (Biordi et al., 2015). Additionally, a common misunderstanding persists that the loss of “baby teeth” make ECC inconsequential and this attitude is correlated with lower likelihood of dental visits and frequent toothbrushing (Nelson et al., 2017). The gap in access to and perceived importance of early dental care is problematic as poor pediatric oral health may have long-lasting repercussions including chronic diseases in adulthood and culminate in more severe and expensive healthcare interventions (Abou El Fadl et al., 2016; Nelson et al., 2017). The long-term effect of ECC on health outcomes within low SES communities is especially concerning due to the population’s existing vulnerabilities to health disparities (APA, 2017).

Another barrier to positive oral health outcomes among children from low SES communities is lack of oral health knowledge. Caregivers in low SES communities cited a lack of oral health knowledge, habitual dental neglect, and barriers to health services as impediments to adopting recommended oral health behaviors (Collins et al., 2016). This indicates that just as ECC are multifactorial, interventions must be multidimensional to overcome barriers and provide support to ameliorate oral health disparities. Oral health interventions need to address multilevel health determinants from personal education, to daily behaviors inside the home, to affordable resources within the community (Wilson et al., 2016).

Crucial Role of Caregiver Knowledge on Oral Health Attitudes and Behaviors

Due to the vital role of caregivers in pediatric oral health, interventions should target their oral health knowledge. Wilson et al. (2016) found a correlation between

caregivers who demonstrated more oral health knowledge and higher attitude scores regarding the importance of oral health and increased adherence to oral health behaviors. Conversely, Mahat and Bowen (2017) found that caregivers with lower levels of oral health knowledge had increased prevalence of ECC among their children. Wilson et al. (2016) and Mahat and Bowen's (2017) findings underscore the importance of caregiver education as a critical first step in driving attitude and behavior change.

The relationship between low caregiver oral health knowledge and increased ECC suggests a lack of perceived urgency around the issue. Caregivers tend to overestimate their child's oral health status which decreases the salience of preventative care visits and daily behaviors (Divaris et al., 2012). Caregivers from low SES communities reported a lack of awareness of the links between oral health and long-term health issues or the association between ECC and permanent teeth caries (Mahat & Bowen, 2017). A lack of perceived urgency in addition to barriers to dental care access may explain why few caregivers (19%) sought follow-up care in response to elementary school dental clinics that identified their child's ECC (Nelson et al., 2017). Additionally, caregivers reported a lack of knowledge on the impact of daily behaviors on oral health such as increased caries with bottle or infant cup use and snacking, or the importance of drinking fluoridated tap water to prevent caries (Mahat & Bowen, 2017). Caregiver education should emphasize the long-term repercussions of ECC to increase the perceived importance of early, daily oral health behaviors.

Rethinking Oral Health Education: Knowledge, Attitudes, & Behavior

Oral health knowledge is a vital component of caregiver education, yet caregivers continue to face challenges enacting best practices at home (Wilson et al., 2016).

Traditional oral health interventions address behavior changes with generic recommendations (e.g. brush twice a day); however, caregivers cite frustration and difficulty with their child's oral hygiene as a reason for persistent oral health issues (Collins et al., 2016; Naidu, Nunn, & Irwin, 2015). Impactful caregiver education should incorporate actionable skills for use within the home and dental care resources that lower barriers to access in their communities. After oral health education, low SES caregivers cited competing priorities and lack of resources or time as major impediments to enacting oral health knowledge (Collins, 2016). Education that solely provides clinical information is insufficient for behavior change without tools to support caregivers at home (Naidu, Nunn, & Irwin, 2015). The same caregivers cited fostering rules and routines, modeling of older family members, cooperation between caregivers, and peer support as successful strategies for improving pediatric oral health within their homes (Collins et al., 2016). This suggests that providing caregivers with tools that organize recommendations into implementable habits that fit within existing family routines and best practices on social modeling of oral health behaviors are welcome interventions.

Even if one follows positive oral health habits at home, professional dental health services are still necessary to prevent, diagnose, and treat issues that may arise over childhood (AAPD, 2013). However, previously mentioned barriers to affordable services that accept low-income insurance or provide low-cost services hinder caregivers' ability to obtain care (Biordi et al., 2015). Low SES caregivers cited community programs, easily accessible high-quality information, and information circulated via community and social hubs as helpful resources outside of the home to support their children's oral

health (Collins et al., 2016). Education that streamlines high-quality information and includes accessible, community-relevant specific resources helps overcome low SES caregivers limited time and financial resources.

Self-efficacy is the belief in one's capabilities which informs the motivation to act, likelihood to set goals or persist when challenged, and be resilient when confronted with set-backs (Brown, 2011). Pediatric oral health education should target the perceived importance of early oral health behaviors and caregivers' self-efficacy. Self-efficacy is an appropriate area of focus because caregivers with higher self-efficacy and importance of oral health attitude scores reported higher behavioral adherence (Wilson et al., 2016).

Traditional oral health education programs lack behavioral-change components consistent with the transtheoretical model (TTM) that aims to increase self-efficacy by promoting professionally assisted, self-managed changes to health behaviors (Naidu et al., 2015). TTM is a widely implemented theory of behavioral change that conceptualizes five stages a person undergoes to enact a new behavior: 1) *precontemplation* – no intention or awareness to change, 2) *contemplation* – considering pros and cons to change, 3) *preparation* – recognition of benefit to change and plans to do so, 4) *action* – change behavior is attempted, and 5) *maintenance* – long-lasting behavior change (Brown, 2011). Increased self-efficacy is fundamental to fostering change required for health promotion and may inform the structure of future interventions targeting caregivers (Naidu et al., 2015).

The TTM is a lens to assess oral health education's ability to guide caregivers through stages of change in their perception of the urgency of pediatric oral health and

their daily capacity to manage it (Naidu, Nunn, & Irwin, 2015). Self-efficacy is an important aspect of reinforcing caregiver's pro-health behaviors by building confidence in their skills. For example, Heubner & Milgrom (2015) found the best predictor of absence of childhood ECC was the parents' perceived skill in carry out toothbrushing as part of their child's daily routines. A small, exploratory control study reported that implementing motivational interviewing techniques with caregivers regarding pediatric oral health was associated with higher behavioral adherence and less resignation to oral health issues (Naidu et al., 2015). Additionally, caregivers rated interactive education sessions with designated practice time as more valuable than passive education sessions (Heubner & Milgrom, 2015). Oral health education should focus on building caregiver self-efficacy by leveraging oral health knowledge to guide caregivers through stages of change and skills-training to set them up for success in the change process.

Interdisciplinary Collaboration in Pediatric Oral Health Interventions

Even if educational content is reimagined to address caregiver knowledge in a manner that changes attitudes and behaviors, a barrier persists in connecting with families in a timely way before oral health issues manifest. Interdisciplinary collaboration is a strategy to connect with low SES families earlier and more frequently than the typical healthcare system (Biordi et al., 2015). Petri (2010) defines interdisciplinary collaboration in the context of health care as "an interpersonal process characterized by healthcare professionals from multiple disciplines with shared objectives, decision-making, responsibility, and power working together to solve patient care problems" (p. 79). In traditional healthcare settings, interdisciplinary efforts have been associated with

improved patient outcomes and quality of care, lower healthcare organization costs, and increased job satisfaction for healthcare providers (Petri, 2010). The World Health Organization (WHO) has promoted the integration of dental care into primary healthcare services to leverage collaborations across an array of health providers (Abou El Fadl et al., 2016).

Interdisciplinary interventions may broaden accessibility to dental care in low SES communities faced with barriers such as a shortage of dentists that accept public insurance and treat young children (Biordi et al., 2015). Further, preliminary interdisciplinary pediatric oral health interventions integrated into existing childcare systems indicate improved oral health outcomes for low SES families (Abou El Fadl et al., 2016). Interdisciplinary collaborations can also expand the workforce and thus the capacity of interventions to take place in non-traditional settings. Biordi et al. (2015) report that leveraging dietitian and nurse practitioner collaborations at supplemental nutrition service locations resulted in increased caregiver knowledge, dental visits, and pro-oral health behaviors. Interdisciplinary collaborations may be an effective strategy for pediatric oral health to increase intervention opportunities outside of traditional spaces (e.g. primary care appointments, community welfare agencies, schools) and leverage varied scopes of practice to address barriers across home and community contexts.

Community health workers & occupational therapists as interdisciplinary partners

Community health workers (CHW) and occupational therapists (OT) are well-positioned to be interdisciplinary partners in supporting low SES caregivers navigate

contextual issues that impede pediatric oral health behavioral adherence within the home and community. CHWs act as liaisons between health services and local communities for the dual purpose of facilitating access to services and improving the quality and cultural competence of services specific to the communities addressed (Martin et al., 2018). The Occupational Therapy Practice Framework (American Occupational Therapy Association [AOTA], 2020a) briefly describes OT services as “the therapeutic use of everyday life occupations with persons, groups, or populations (i.e., the client) for the purpose of enhancing or enabling participation.” (p. 1). OTs and CHWs share a focus on the influence that environments and culture play in impacting participation and health. CHWs and OTs provide relevant perspectives and tools for caregivers to directly use in community and home contexts and can reinforce each other’s efforts.

CHW programs have been successful for diabetes and asthma initiatives and represent an opportunity to advance pediatric oral health in low SES communities (Martin et al., 2018). CHWs are members of the communities they are liaisons to, which increases their efficacy through shared language, cultural competence, trust, and their knowledge of community-specific issues and resources (Martin et al., 2018). Public health initiatives leveraging CHWs have significant potential in addressing barriers for low SES communities. For example, low SES American Indian/Alaskan Native caregivers working with CHWs perceived fewer obstacles to oral health and reported higher behavioral adherence (Wilson et al., 2016). This suggests that CHWs are valuable for increasing oral health knowledge through shared language and presence in accessible community spaces, changing attitudes by providing culturally relevant and

actionable resources accessible within their communities, and ultimately influence pro-oral health behaviors via reduction of perceived barriers with increased self-efficacy.

OT services regularly focus on everyday living skills including daily grooming behaviors such as oral health skills in populations across the lifespan, but the field has been absent from most formal oral health promotion initiatives. However, a broad push for health promotion within the scope of OT is building as the field recognizes its unique healthcare perspective in problem-solving effective solutions that facilitate participation (AOTA, 2017). OT's emphasis on client-centered care, developmental milestones, attention to habits and routines as integral to health, specialty in building performance skills, and evaluation of success as outcomes of participation are essential to fostering self-management skills in health promotion initiatives (Stern, 2018). Additionally, OT specializes in assessing modifications to environments and tasks themselves to promote participation and improve oral health experiences between caregiver and child (Como et al., 2019). CHWs and OTs as interdisciplinary partners may increase the salience of oral health education in culturally relevant, skill-based ways that increase self-efficacy and oral health adherence.

Conclusion

Pediatric oral health is an essential aspect of general health over the lifespan, and low SES children are disproportionately vulnerable to ECC and poor oral health outcomes (Biordi et al., 2015). Caregivers are vital for pediatric adherence to daily pro-health behaviors and accessing preventative and restorative dental services (Divaris et al., 2012). However, low SES caregivers face additional challenges due to resource constraints and barriers to dental services that increase risk for poor oral health

outcomes (Collins et al., 2016). Traditional oral health promotion efforts overwhelmingly focus on providing oral health information to caregivers but have not resulted in significant gains (Naidu et al., 2015). This literature review explored caregiver education strategies to increase the effectiveness of pediatric oral health promotion within low SES communities. Preliminary efforts to promote caregiver self-efficacy by focusing on actionable knowledge that changes attitudes on the importance of oral health and daily behaviors suggest that a TTM- inspired, self-management model may be helpful in enacting lasting change (Huebner & Milgrom, 2015; Naidu et al., 2015).

Interdisciplinary partnerships pose opportunities to increase low-cost, accessible contact points with low SES families to initiate health promotion efforts early on in a child's development and reduce reliance on emergency care (Abou El Fadl et al., 2016; Biordi et al., 2015; Petri, 2010). Interdisciplinary partnerships between CHWs and OTs in particular may address barriers low SES families experience within their home and community contexts in a manner that traditional dental professionals are not equipped to do. Future initiatives should leverage OTs and CHWs partnerships that enact self-management interventions targeting skill-building and self-efficacy to improve pediatric oral health within low SES communities.

Literature Review by Jenny Leaser

Oral health disparities, including differences in dental insurance access, occur across many different populations in the United States, including various racial and ethnic groups, socioeconomic status groups, and groups based on geographical location (Centers for Disease Control and Prevention, 2016). Within these populations, many individuals and families face poor oral health outcomes due to insufficient resources, like toothbrushes or toothpaste, lack of accessible and affordable dental care, and lack of funding and affordable insurance options (Centers for Disease Control and Prevention, 2016; Dye et al., 2017; Verlinden et al., 2019). Specifically, dental disease is one of the most common chronic conditions experienced by children, which can have lifelong impacts on overall health (Riter et al., 2008). Chronic health conditions impact not only lifelong overall health but also one's ability to participate in meaningful occupations. Addressing disparities in access to oral health care may help overall health outcomes for at-risk populations.

Lack of Access to Dental Care for Low-Income Individuals or Families

Access to dental care is one of the contributing factors of poor oral health outcomes for children and adolescents. Dental care providers are often not accessible or affordable for low socioeconomic status individuals or families, including those with medical insurance (Verlinden et al., 2019). Medicaid is a federal-state program that provides health insurance for anyone with low or limited income (Medicaid.gov, n.d.). Dental care providers may either place a cap on the number of patients with Medicaid they accept at a given time or choose not to take any Medicaid patients at all (Verlinden et al., 2019). Even when families have access to employer-provided

insurance, dental coverage can be limited or not included (Verlinden et al., 2019). Given these circumstances, low socioeconomic status families have limited options when accessing affordable dental procedures (Verlinden et al., 2019). Since dental procedures can be expensive, especially when providing for an entire family, families may choose to ignore health concerns, avoid going to the dentist, attend limited visits, or choose certain family members to take to the dentist consistently (Kenney et al., 2005). However, preventive measures, like visiting the dentist, can be more cost-effective in the long run, as needs will be addressed before they develop into a dental emergency (Kenney et al., 2005).

In addition to lack of insurance coverage, families with low socioeconomic status may lack access to other resources that would enable them to visit the dentist, like ability to pay, transportation, or availability of dental providers in their area (Kenney et al., 2005; Skinner, 2017). Specifically, in rural areas, dentists may be located further away, and transportation options to get there are limited, including trains, buses, and even owning one's own vehicle (Bersell, 2017). Families may have to travel greater distances to access dental offices based on the location of clinics, particularly to the location of clinics that accept Medicaid insurance (Bersell, 2017). Different transportation types, including buses, Uber, Lyft, and trains, may either be unavailable, limited, or unaffordable for families needing to travel to reach dental care facilities (Rural Health Information Hub, n.d.). These limitations can prevent families from attending biannual dental check-ups, increasing their likelihood of experiencing dental emergencies.

Because access to care is a common barrier, there is a current movement attempting to move dental care into primary care clinical settings (Hostetter & Klein, 2015). This movement stems from the idea that providing services in a primary care setting could expand access to care, and potentially reduce costs of dental care since it can be easier to gain access to health insurance that covers primary care rather than dental care (Hostetter & Klein, 2015). It has been shown that the likelihood that a family could receive dental care greatly increases if they can receive information and recommendations from primary care doctors (Hallas et al., 2015). These changes in oral healthcare practice may help healthcare practitioners meet all the needs of their clients.

Effects of Oral Hygiene Education on Oral Health

Though there can be many roadblocks preventing an individual or family from visiting the dentist, oral hygiene education provided in their home, local, community, or school setting can improve oral health for children (Haleem et al., 2016; Nakre & Harikiran, 2013). Some elementary schools have implemented oral health educational courses as either an after-school program or within the school curriculum and have seen improved oral health within their student population (Haleem et al., 2016). School-based programs can raise awareness regarding proper brushing techniques, provide funding for oral hygiene materials and supplies, and provide fluoride varnishes and sealants utilizing portable dental units for kids and families with limited funds (Alsumait et al., 2019).

Programs related to oral health education have been found to improve oral health outcomes, as well as access to healthcare, funding for dental care resources, and

dental care research (Nakre & Harikiran, 2013). Specifically, foundations that focus on raising awareness have improved general knowledge of oral health within communities and the government (Gehshan, 2008). When the government is informed on current evidence and research, like inaccessible or unaffordable healthcare, they can implement laws and programs or provide funding for foundations that plan to make improvements (Gehshan, 2008). For example, one government-funded project chose to provide school-based oral health curricula and after school programs, which increased oral health education opportunities, resources for community dentists, and oral hygiene supplies, like toothbrushes, floss, and toothpaste for that community (Gehshan, 2008).

Community Outreach for Low-Income Families

Just as child and family education has been shown to be beneficial in improving oral health outcomes within communities, so have community dental health programs targeted towards low-income families (Teusner et al., 2014). These programs have provided resources including fluoride treatments, toothbrushing instructions, and parent education, which have been shown to improve overall oral health within low socioeconomic status families (Teusner et al., 2014). Programs like these can provide resources that are not readily available or affordable for low-income families; since in some instances, poor oral health is not based on lack of education, but rather on the inability to afford resources and supplies needed to clean teeth properly (Teusner et al., 2014).

Involving children in community outreach oral hygiene programs for low socioeconomic status families has also been found to help ensure meaningful and

helpful programs are implemented for the community's true needs (Walker et al., 2016). Programs can be implemented through schools or community organizations to understand what is needed at each site, as needs will differ across communities, which can then raise awareness to what needs could be addressed by government-funded projects (Teusner et al., 2014; Walker et al., 2016). If these needs are met, oral health outcomes may improve for low-income families.

Multidisciplinary Healthcare Teams Regarding Dental Care

Multidisciplinary healthcare teams can provide a unique approach to tackling oral health for the pediatric population (Hallas et al., 2015). Using interdisciplinary healthcare teams can help ensure all individuals receive holistic care (Hallas et al., 2015). Since dental care is not typically addressed in general health care and occupational therapy settings, interdisciplinary teams can adapt current methods to include dental assessment and support foundations researching and advocating for dental care access, affordability, education, and funding (Gehshan, 2008; Riter et al., 2008). Supported foundations that target oral health care services have been shown to help improve community outreach through implementing education for children and families and providing resources, like coupons for dental care tools (Gehshan, 2008; Riter et al., 2008). Understanding where healthcare providers are lacking can help healthcare fields make services, like dental care, accessible and affordable for all.

There is evidence to support improved oral health outcomes for children when an interdisciplinary approach is used. Hallas et al. (2015) utilized collaboration between a nursing program, pediatric nursing practitioner, and pediatric dentistry program, and found that oral health within the pediatric population can improve due to education,

advancements in techniques, and community outreach across multiple disciplines (Hallas et al., 2015). Improvement was attributed in part to the collaboration of these disciplines providing consistent information and suggestions across all environments (Hallas et al., 2015). Considering the perceived and potential benefits of a multidisciplinary approach to dental care, assessing oral health across multiple healthcare disciplines can help children prevent health conditions and recurring visits to healthcare facilities (Riter et al., 2008). Additionally, prevention of dental health conditions may be impacted by the consistent dental care information across multiple settings and disciplines and by providing resources that were previously inaccessible or unaffordable for families (Teusner et al., 2014).

Role of the Healthcare Team in Oral Health Assessment and Intervention

Due to the link between oral health and overall health, healthcare practitioners, including occupational therapists, should address oral health within their treatment plans. Currently, many healthcare fields have limited or no resources to evaluate their client's oral health needs (Ormara et al., 2019). For example, occupational therapy is a healthcare field that uses interventions to improve one's ability to engage in meaningful occupations including hygiene activities (American Occupational Therapy Association [AOTA], n.d.). In addition, occupational therapy practitioners address habits, routines, roles, and contextual factors that can all impact participation in activities of daily living such as oral hygiene (AOTA, n.d.). In some instances, clients find occupations or engagements involving eating to be significantly important; however, oral health may limit them from participating in these activities if they cannot properly swallow or chew. Other related psychological and social impacts of oral health on occupational

engagement include oral pain, embarrassment about the mouth due to their smile, and impacted laughter.

Healthcare practitioners of all fields should update, adjust, or implement assessment tools to ensure oral health needs can be addressed during treatment (Ormara et al., 2019). Riter et al. (2008) found that accessing oral health care across multiple disciplines can help prevent health conditions and recurring healthcare facilities visits. Prevention of health conditions is one of the best ways to support positive oral health outcomes. Two ways to support prevention include consistent dental care information across multiple settings and disciplines and receiving previously inaccessible or unaffordable resources for families (Teusner et al., 2014). This implementation may include assessments that help indicate if these needs are being met and allow practitioners to provide resources to improve their client's overall health. In order to begin to develop more assessments, healthcare professionals need an understanding of what is readily available (Ormara et al., 2019). Currently, occupational therapy has few assessments that are used to assess and treat oral health issues; however, one example of an occupational therapy oral health assessment is the Occupational Therapy Eating, Oral Care, and Oral-Motor Assessment (Mehrl, n.d.). This assessment can provide an occupational therapist with information about their client regarding functional performance skills, eating and drinking patterns, signs or symptoms of aspiration, tooth brushing skills, and general health information (Mehrl, n.d.). More broadly, occupational therapy uses an assessment tool called the occupational profile. This profile delves deep into specific client factors that impact

occupational engagement and can be a great tool to assess if oral health is impacting participation in meaningful occupations (Whitney, 2019).

Needed Reformation for Dental Care Services

As previously mentioned, one major reform needed is increasing access to services across all communities. One strategy for increasing access is increasing the oral health workforce. Two options for increasing the workforce and the locations of the services provided are utilization of the Dental Care Health Professional Shortage Areas (DHPSA) and Dental Health Aide Therapists (DHATs) programs (Bersell, 2017; Koppelman & Singer-Cohen, 2017). DHPSA works to ensure that new dentists are strategically placed in areas of most-need (Bersell, 2017). Once there is an increase in accessibility of services to high need areas, professionals can advocate for funding for resources to provide services to communities (Gehshan, 2008). DHATs deliver oral care while working with a supervising dentist to ensure standards and procedures are followed and met thus getting dental providers into the field in a shorter period while also ensuring quality practice (Koppelman & Singer-Cohen, 2017). Using a DHAT can help communities improve access to care, decrease the cost of care, require shorter durations in school and training, etc. (Williard, 2014).

Conclusion

With improving access, availability, affordability, and quality of dental care, families can be encouraged to practice good dental hygiene, find dental hygiene resources, and prevent recurring dental visits (Williard, 2014). Programs targeting schools and low-income families should continue to provide resources, like toothbrushes and toothpaste, to families that cannot afford these items. These

programs can also continue to provide education and research to families within their communities, as well as to appropriate government officials who can help implement funding and recognition towards dental health issues. This education and funding can help healthcare workers reform current practices to include dental care as primary care, thus opening the door for many families to access care that, at this point, is inaccessible and unaffordable. Specialty fields, like occupational therapy, can support this movement by providing evidence-based treatment, education, and community resources for individuals and families needing dental care.

Literature Review by Ellen Minor

The current research surrounding oral health status among children in low-income families shows negative implications for these individuals (Seirawan et al., 2012). The U.S. Surgeon General's report indicated that although oral disease is common throughout the United States, there are prominent inequalities between income levels (U.S. Department of Health and Human Services, 2000). Individuals of low income are more likely to have untreated oral diseases and are less likely to receive dental care (Grembowski et al., 2019; Kenney et al., 2005). While inequalities exist and there are many negative impacts on poor oral health care, there is evidence to show that educating caregivers can have an impact on oral health outcomes and practices (Akpabio et al., 2008; Biazar, 2019). This review of literature will discuss the adverse effects of poor oral hygiene, the disparities in access to oral healthcare based on income, and educational strategies used to increase oral health through the use of multidisciplinary teams.

Effects of Poor Oral Hygiene on General Health Status

Poor oral hygiene may affect a person's overall health status in a multitude of ways. These effects can range from mild symptoms to severe diseases and conditions. According to Seirawan et al. (2012), poor oral health can lead to oral diseases, which increase an individual's likelihood of developing a systemic disease, often requiring emergency hospital visits, increased need for medications, and death. For example, periodontal disease, an infection of the gums from bacteria, increases the risk of cardiovascular disease by 20%, and the risk of stroke is even higher (Duley et al., 2012). Along with the increase of cardiovascular disease and stroke, Duley et al. (2012)

determined there is a reciprocal relationship between periodontal disease and diabetes. Periodontitis is a side effect of diabetes, but periodontitis also increases an individual's risk of developing diabetes (Duley et al., 2012). Additionally, mothers' poor oral health increases the risk of premature births and low birthweights in babies (Duley et al., 2012).

Oral health diseases not only increase the risk of systemic diseases, but they may also impact one's mental health status. Zhang et al. (2019) determined that students with poor oral health-related quality of life were more likely to experience depressive symptoms. Along with feelings of depression, it was concluded that children with severe dental caries (cavities) were more likely to experience embarrassment, withdraw from social activities, and report increased anxiety (Seirawan et al., 2012). These individuals may suffer from lowered self-esteem due to avoiding conversations, laughing, and smiling as a means to hide their mouths and teeth (Seirawan et al., 2012). Lowered self-esteem will compromise their ability to build relationships and participate in social and community activities. Overall, it is evident that poor oral health can produce negative impacts on an individual's general health status.

Effects of Poor Oral Health Status on Academics

Not only can poor oral health cause concerns with general health status, but it can also cause concerns on school performance in young children. Jackson et al., (2011) concluded that children with poor oral health were 2.3 times more likely to perform poorly in school. Seirawan et al. (2012) conducted a study in to determine the number of school days missed by students and the number of workdays missed by parents due to student's dental problems. The results concluded that 5.5% of the 2,313

children who were part of the study missed a school day due to dental issues, along with 6.4% of parents who missed a workday because of their child's dental problems (Seirawan et al., 2012). Furthermore, the impact of missing school due to a dental problem increased when the child did not have access to dental care (Seirawan et al., 2012). Eleven percent of students who lacked dental care missed school days compared to only four percent of children who had access to dental care (Seirawan et al., 2012).

School absenteeism is not the only negative effect that poor oral health has on students. In addition, children with poor oral health were also found to have lower grade point averages (GPA) compared to children with better oral health (Seirawan et al., 2012). Specifically, students with toothaches in the past six months were almost four times more likely to have a lower GPA than students without a toothache (Seirawan et al., 2012). Jackson et al. (2011) discovered that pain from oral health-related conditions affected a student's ability to concentrate in school, and may play a role in the correlation of toothaches and lowered GPAs. Overall, children with poor oral health are at an increased risk of diminished educational experiences (Jackson et al., 2011). Additionally, children of low-income families are at an increased risk of having oral health issues that affect academic performance (Akpabio et al., 2008).

Effects of Socioeconomic Status on Oral Health

There is a multitude of issues that result from a family's socioeconomic status (SES) in terms of oral health complications and the resulting impact poor oral health has on the family's financial status. Individuals of low SES are more likely to experience dental caries and decayed teeth (Akpabio et al., 2008; Mathur et al., 2014; Seirawan et

al., 2012). Seirawan et al. (2012) documented that 73% of children from low SES backgrounds have at least one dental caries. Akpabio et al. (2008) concluded that children from low SES backgrounds are more likely to experience dental caries. Additionally, adolescents from impoverished neighborhoods had an increased number of decayed and missing teeth (mean of 1.74 teeth per person) compared to adolescents from middle/upper-class homes (mean of 0.96 teeth per person) (Mathur, 2014). Akapabio et al. (2008) were unable to determine if the correlation between SES and dental caries was due to the lack of available health care or if it was due to the lack of knowledge caregivers have regarding dental disease and proper oral hygiene (Akpabio et al., 2008). In either case, there are underlying factors in place that should be addressed. Not only do dental caries have an inverse relationship with SES, but low SES limits the amount of preventative care an individual may receive (Akpabio et al., 2008; Mathur, 2014; Seirawan et al., 2012).

Families of low SES are less likely to receive dental care and are more likely to have unmet dental needs (Jackson et al., 2011; Seirawan et al., 2012). In particular, children of low-income, uninsured families were more than twice as likely to have not received any preventative dental care (Kenney et al., 2005). Specifically, more than half of uninsured children from low-income families did not receive a preventive dental checkup during the previous year, and unmet dental needs were higher among children from low-income families (Kenney et al., 2005). Relatedly, children who lacked dental insurance were more likely to miss school for dental pain but were less likely to miss school for a preventative dental checkup (Jackson et al., 2011).

While low SES puts children at higher risk for dental caries, these children often lack access to urgently needed care to address the oral health issues due to the financial burden of dental services. In 2015, approximately 298 billion dollars was spent worldwide on oral conditions, and much of the cost was paid out of pocket due to the limited amount of people with dental insurance (Listl, Galloway, Mossey, & Marcenes, 2015). According to Bernabé, Masood, and Vujicic (2017), households that paid out-of-pocket for dental care had 1.65 increased likelihood of facing impoverishment (defined as falling below the country's poverty line). Additionally, individuals lacking dental insurance were more likely to miss school or work due to dental pain and were more likely to suffer from financial burdens as a result (Seirawan et al., 2012). Seirawan et al. (2012) discussed the importance of state governments integrating dental services into universal health insurance programs as this would greatly help individuals of low SES reduce financial burdens due to oral health related conditions. Caregivers are not only responsible for funding oral health care, but they have many other additional roles supporting their child's oral health.

Role of Caregivers in Children's Oral Health Status

Caregivers play a vital role in their children's oral health and oral hygiene routines. Research shows that mothers (or other primary caregivers in the absence of mothers) are typically held responsible for teaching hygiene routines along with cleaning infants' mouths and brushing children's teeth. (Akpabio et al., 2008; Finlayson et al., 2019). Mothers who engage in good oral health behaviors themselves are more likely to know how to promote proper oral health behaviors in their children (Akpabio et al., 2008). Research has shown that if caregivers are educated on proper oral health care,

dental caries and other oral issues can be prevented (Akpabio et al., 2008; Nakre & Harikiran, 2013). Specifically, Nakre and Harikiran (2013) discovered that oral health education to caregivers is effective in improving the knowledge, attitude, and practice regarding oral health and is effective in reducing plaque and caries, and improving gingival health.

Primary caregivers can also go beyond providing basic oral health care (e.g. brushing teeth) to their children. When properly educated, these caregivers can be trained to assess their child's overall oral health including, noting changes in oral health status and determining a need for a dental referral (Pradhan, Keuskamp, & Brennan, 2016). The study concluded that caregivers noted more changes in the teeth than the dentist did (Pradhan et al., 2016). Additionally, parents can note barriers to providing oral health. Some of these barriers may include sensory processing issues, pain, aspiration, or anxiety (Mehrl, n.d.). When parents are made aware of these barriers and bring them to the attention of medical professionals, oral health issues can be decreased (Mehrl, n.d.).

Successful Strategies to Include in Educational Oral Hygiene Programs

There are already many programs aimed at educating caregivers on proper oral health. As these programs have been implemented, key strategies have been identified and proven to be successful when designing these programs. One key strategy is to include all family members in the education (Akpabio et al., 2008; Biazer, 2019). Akpabio et al. (2008) went as far as to say that oral health promotion should be a family matter and should include education to the children. Biazer (2019) noted that involving

the whole family in all stages of the education process increases the excitement and involvement in participating in oral hygiene tasks.

Another first step in designing an oral health program for caregivers is first assessing what parents do and do not know. This will help determine where the gap in knowledge lies and identify relevant topics (Akpabio et al., 2008). A lack of knowledge may be a cause of the amount of oral diseases a person contracts (Akpabio et al., 2008). Watson, Horowitz, Garcia, and Canto (2007) tested caregiver knowledge prior to implementing an oral health program. These researchers discovered the biggest predictor of childhood dental caries is mother's knowledge or lack of knowledge on this topic (Watson et al., 2007). Before creating an oral health program, Akpabio et al. (2008) also created a pretest to find out where caregivers lacked knowledge in order to tailor the program to the adults specifically and helped caregivers stay engaged.

Communication is key to getting parents to participate in oral education programs. Parents and caregivers value the tone and language that the oral health program uses (Biazer, 2019; National Center on Early Childhood Health and Wellness [NCECHW], 2017). Programs that blamed caregivers and ones where caregivers felt lectured had the lowest success rate compared to programs which used motivational interviewing (Biazer, 2019; NCECHW, 2017). Instead of approaching the program with a goal of telling parents what they are doing wrong, make the goal of the program to understand where the parents are coming from with strategies to help individual situations (Biazer, 2019). Motivational interviewing was found to increase parents' willingness to share thoughts, ideas, and opinions impacting their child's oral health behaviors (NCECHW, 2017).

Lastly, interactive activities yield significant increases in participation and success of oral health programs (Biazer, 2019; Gunderson, 2011). Biazer's (2019) program called 'All Aboard! The Cavity Free Express' includes multiple interactive activities to get children and caregivers involved in the learning. As the children learn about oral health by participating in activities, the parents are also learning indirectly (Biazer, 2019). Additionally, Gunderson (2011) created an interactive program for adults, including brief interventions related to oral health. The parents who received brief interventions had increased dental knowledge compared to the adult receiving traditional lecture-based lessons (Gunderson, 2011). As can be seen, there are lots of important thoughts that need to be considered when creating oral health programs. Interdisciplinary teams can also increase success in these programs.

Benefits of an Interdisciplinary Team in Oral Health Education

An interdisciplinary team includes staff of different professions who work together to share expertise, knowledge, and skills to impact patient care (Nancarrow et al., 2013). Interdisciplinary teams also assist in providing more client-centered care (Dahl-Popolizop, Muir, Davis, Wade, & Voysey, 2017). Specifically, teaming with an occupational therapist (OT) in primary care settings allows for patients to receive tailored care to their specific needs (Dahl-Popolizop et al., 2017). When oral health professionals team with OTs, they can work together to provide proper oral health needs while working on embedding the tasks into their everyday routines and habits. This client-centered care will improve overall health in these patients.

Working as an interdisciplinary team can benefit other professionals just as much as it can benefit the patients. When a team includes multiple professions, it allows

different professions to learn about each other and their unique roles and skills (Duley et al., 2012). The article “Benefits of Interprofessional Collaboration” (2020), states that interprofessional collaboration levels the playing field and acknowledges that every profession plays an important role on the care team. Duley et al. (2012) created an interdisciplinary team including nurses and dental hygiene professionals in order to increase preventative care. The goal of this joint program was for the two professions to better understand each other professions, along with learning from each other (Duley et al., 2012). As a result of this program, the two professions were able to collaborate and develop a system to reach out to a larger population needing dental care (Duley et al., 2012). Not only is it important for professionals to understand different disciplines through interdisciplinary teams, but it also has the opportunity to raise job satisfaction by creating a sense of community and trust between employees (Tiger Connect, 2020).

Lastly, interdisciplinary teams help to better achieve goals around health promotion compared to teams of one discipline (Waggie, Gordon, & Brijlal, 2004). Waggie et al. (2004) conducted a study to look at health promotion initiatives in the schools and found programs were uncoordinated, erratic, and limited to the resources the school had access to. Waggie et al. (2004) proposed that school health promotion programs may be more effective if professions outside of academia were involved. Newton (2012) stated there are a variety of reasons people suffer from oral health issues and by teaming up with other disciplines the amount of people who suffer may decrease. The topics in these articles relate to the interdisciplinary team of community health workers, dental professionals, and occupational therapists. By teaming together, this interdisciplinary team can help combat the negative issues surrounding oral health.

Overall, this literature review reveals the importance of educating caregivers of low SES families on the significances of oral health. Oral health education can reduce the adverse effects poor oral hygiene has on overall health. It will limit secondary systemic diseases along with additional psychosocial concerns. This education can also help to limit the need to miss school and increase participation in school. It is especially important to educate those caregivers in low-income families as they are the ones most affected by this issue. When creating the oral health program, it is essential to remember to involve the whole family interactively, all while using positive communication methods. Lastly, utilizing interdisciplinary teams can be an asset to the oral health program. Considering the many facets related to oral health for low SES families, it is possible to help limit the negative effects of poor oral health through effective education strategies.

Literature Review by Delorianne Sander

Supporting good pediatric oral health outcomes can improve school and sleep performance and is associated with increases in overall positive health outcomes (Braun & Cusick, 2016; Casamassimo, Thikkurissy, Edelstein, & Maiorini, 2009; Ramos-Gomez, 2019). Currently, there is much support for oral health interventions across disciplines with particular interest in improving oral health outcomes for children from families of low socioeconomic status and refugee populations (Ramos-Gomez, 2019). Many novel settings, teams, and interventions are being used to educate families on oral health routines and to increase access to dental services (Braun & Cusick, 2016). Occupational therapists bring a unique perspective to these interdisciplinary teams by contributing to the development of service delivery models and interventions related to family oral health routines and patient education (Falk-Kessler, MacRae, & Dyer, 2005). The United States is home to a large population of Somali and Somali refugee families and holds a public health interest in improving social determinants of health for all of its citizens (Philbrick et al., 2017). The aim of this literature review is to explore the potential impact patient education may have on pediatric dental outcomes and to generate evidence-based ideas for intervention to improve oral health outcomes for Somali families in the United States.

Pediatric Oral Health

Proper oral health care for children is associated with improved school and sleep performance and increased overall health outcomes; unjustly, low family education levels and socio-economic status are associated with poor oral health outcomes in children (Braun & Cusick, 2016; Casamassimo, et al., 2009; Ramos-Gomez, 2019).

Oral health services for children ages birth to 14 years old are generally provided in a dental clinic setting. Recently, innovative models of care are emerging in an effort to reduce the rate of dental caries, or cavities (Braun & Cusick, 2016). Non-traditional oral health services have been successfully provided in collaboration with or integrated into medical teams, or through telehealth-enabled teams to provide education in the home setting to screen, educate, and prevent poor oral health outcomes for families (Braun & Cusick, 2016). Understanding which basic preventive pediatric oral health services are most accessible for families can improve oral health outcomes of reducing stress, eliminating barriers to occupation, and improving health outcomes for families (Braun & Cusick, 2016).

A preventable issue in pediatric oral health is early childhood caries (ECC), or tooth decay, though it is the most common chronic disease of childhood (Tiananoff, et al., 2019). Early childhood caries is preventable through management of diet and oral health routines (Casamassimo, et al., 2009; Fisher-Owens, 2007; Ramos-Gomez, 2019). ECC can cause severe pain, especially when eating, speaking, or sleeping and this in turn interrupts participation in these activities (Casamassimo, et al., 2009). Left untreated, ECC can have cascading consequences limiting or diminishing occupational performance at school and during daily activities, in addition to social consequences associated with oral pain and missed days at school (Casamassimo, et al., 2009; Lim, S., Tellez, M., & Ismail, 2015). Parental and family stress can increase in response to exacerbated dental caries since dental procedures can be expensive, but even more so for uninsured families that are forced to use the emergency room for treatment (Casamassimo, et al., 2009). In the event that dental treatment requires the use of

general anesthetic, pediatric populations have a significantly higher risk of adverse events occurring and the lowest margin of error in service delivery due to the inherent population vulnerability (Cravero et al., 2006). Annually in the United States, tens of thousands of children undergo higher-risk dental procedures under general anesthesia (Casamassimo, et al., 2009).

Providing accessible oral health services to pediatric populations prior to the development of ECC can hugely impact family health, reduce medical costs, and optimize occupational functioning (Casamassimo, et al., 2009). Basic preventive oral care can include risk assessments, anticipatory guidance, fluoride varnish application, dental referral, and prescribing fluoride supplements (Braun & Cusick, 2016). Preventive and restorative oral health services can impact overall health as well as reduce barriers to occupational engagement, particularly at school, for pediatric populations (Braun & Cusick, 2016; Casamassimo, et al., 2009). Basic preventive oral care has the greatest benefit for families at risk of developing ECC (Braun & Cusick, 2016; Casamassimo, et al., 2009). Determining which families or kids are at higher risk for developing ECC requires analyzing the risks for social determinants of health associated with poor oral health outcomes.

Social Determinants of Health

Social determinants of health (SDH) are broad conditions people experience through all social and environmental contexts (Office of Disease Prevention and Health Promotion, 2020). SDH impact a wide range of health outcomes and risks, quality of life, and functioning throughout the lifespan (Office of Disease Prevention and Health Promotion, 2020). SDH include a family's access to health care services, transportation,

their cultural tradition, exposure to adverse childhood experiences, and social norms and attitudes (Akinkugbe et al., 2019; Office of Disease Prevention and Health Promotion, 2020). These SDH are all linked to a family's perception of and utilization of public health services, including preventive and restorative oral health services vital to positive pediatric oral health outcomes (Lim, et al., 2015; Ramos-Gomez, 2019).

Children experiencing SDH contributing to a higher risk for ECC are also at a higher risk for associated difficulties speaking and learning, which project to long-term effects on growth and cognitive development (Ramos-Gomez, 2019). These project to cascading impacts on school performance, earning potential, and quality of life. Ideally, early family intervention can help mediate the impact of these social determinants of health (Cademartori et al., 2019; Musselman, 2020).

Even before a child is born, the oral health status of a mother can predict how a child's oral health will develop (Brailer, Robinson, & Barone, 2019; Cademartori et al., 2019). Experts advocate for pediatric oral health education to start before the baby is born to influence parents' attitudes and behaviors related to oral health, which may improve the likelihood that positive oral health routines are established and followed by children (Brailer et al., 2019). Primary care providers have the opportunity to provide oral health education to families based simply on the frequency of interaction with patients. Interdisciplinary teams may provide more specialized, holistic oral health education for families catered to their specific needs (Braun & Cusick, 2016; Brailer et al., 2019). Education is only one part of establishing effective family oral health habits. Understanding the relationship between parent and family attitudes and health outcomes will improve our ability to provide effective and meaningful interventions.

A study by Vermaire & van Exel (2018) indicated that through parental self-assessment it is possible to determine probable clinical outcomes for parents associated with their attitude towards oral health. Additionally, Musselman and colleagues (2020) collected data from families about their oral health knowledge and practices from self-report questionnaires. The direct measurement of familial attitudes and understanding of oral health illuminated that parents understand the importance of oral health routines, despite commonly misunderstanding the long-term impact oral hygiene may have on a child as they grow and develop (Musselman, 2020; Vermaire & van Exel, 2018). Anticipatory guidance is a form of proactive counseling that assists caregivers in understanding and facilitating the best possible outcomes of growth and development. Knowledgeable healthcare providers are qualified to provide anticipatory guidance to facilitate parental prioritization and decision making related to oral health. Anticipatory guidance for ECC prevention should be provided for families to mediate SDH that negatively impact pediatric oral health (Musselman, 2020). Understanding this information early in a child's life can help provide meaningful risk assessments and deliver specific prevention strategies for poor oral health outcomes for children and families (Brailer et al., 2019; Musselman, 2020; Vermaire & van Exel, 2018).

Higher parent awareness of their child's oral hygiene is associated with positive pediatric oral health outcomes, though about half of parents were unaware of their child's oral hygiene status (Shaghaghian, Savadi, & Amin, 2017). High parental awareness of their child's oral health has also been linked to certain SDH such as higher parent education levels, employed mothers, and, interestingly, to parents whose child has not yet had a visit to the dentist (Shaghaghian et al., 2017). Barriers to oral

health awareness include lack of access to clinics, lack of time, and competing priorities (Fisher-Owens, 2014; Braun & Cusick, 2016). These types of barriers can be mediated through successful care delivery models (Braun & Cusick, 2016). Evidence indicates that family SES and education has a strong impact on pediatric oral health outcomes, indicating that education and services targeted at vulnerable families would have a large impact on reducing the incidence of ECC (Braun & Cusick, 2016; Shaghaghian et al., 2017).

In Minnesota, the growing Somali and Somali refugee community represent a population at risk for social determinants of health associated with negative pediatric oral health outcome (Adams et al., 2013). In particular, Somali refugees experience barriers to oral health care due to social and contextual factors associated with resettlement (Clarkson Freeman et al., 2013; Okunseri et al., 2008). Lack of awareness and deprioritizing of oral health services, both from within the Somali refugee community and reflected in available US services, could create situational vulnerability for children and families associated with poor health outcomes (Adams et al., 2013; Clarkson Freeman et al., 2013).

Somali and Somali Refugee Community in USA

Somali communities in the United States are growing due to refugee resettlement, with many families settling in Minnesota (Philbrick et al., 2017). During the 2016 refugee crisis where 84,994 refugees resettled in the United States, 9,020 were from Somalia (Refugee Processing Center, 2020a, b). Today, ongoing armed conflict, insecurity, and recurring humanitarian crises continues to expose Somali civilians to serious daily threats; critical gaps in health, nutrition, education, food security and

sanitation persist in all Somali states (Information Management Unit, 2019).

Contradictorily, relocating to the United States has slowed significantly in modern times with only 30,00 total refugees (231 from Somalia) allowed to relocate in 2019 despite higher need for refuge (Information Management Unit, 2019; Refugee Processing Center, 2020a, b). While this is a large and growing population in the United States, there are many barriers for refugees' access to healthcare in the United States including language differences and lack of knowledge regarding health systems and structures (Clarkson Freeman et al., 2013; Okunseri et al., 2008). Due to these and other factors, Somali communities in the United States represent a population at risk for social determinants of health that are associated with negative pediatric oral health outcome (Adams et al., 2013). Common cultural attitudes toward healthcare in Somali communities in the United States may deprioritize formal medical health services and can disparage the importance of oral health services (Clarkson Freeman et al., 2013). Somali communities in the United States may have culturally specific attitudes towards healthcare impacted by their life experience and level of acculturation that can be misunderstood or dismissed by the most well-intentioned health workers (Clarkson Freeman et al., 2013; Geltman et al., 2013; Okunseri et al., 2008).

Acculturation, the adoption of dominant local cultural norms, has been shown to be linearly predictive of health outcomes with higher rates of acculturation associated with more positive health outcomes for Somali refugee communities (Geltman et al., 2013, 2014). It is notable to recognize that moderately acculturated refugees may experience the worst of both worlds: consuming greater amounts of refined sugar without fully realizing the beneficial aspects of Western oral hygiene and preventative

oral healthcare (Adams et al., 2013, Geltman et al., 2014). Evidence is limited but indicates that the rate of acculturation is overall slow within the Somali community due to tight-knit bonds and strong ties to Somali culture that are beneficial and important to personal identity and quality of life during resettlement (Geltman et al., 2013, 2014).

Somali families have a higher risk for exposure to trauma related to humanitarian crises and resettlement, in addition to institutional trauma in the United States (Geltman et al., 2013; Okunseri et al., 2008; Philbrick et al., 2017). Trauma-informed care considerations are important for populations fleeing persecution and may impact community attitudes towards health care systems in a positive way (Adams et al., 2013; Clarkson Freeman et al., 2013). Somali refugee communities are complex, well-established, and deeply embedded in the United States, strengthening our nation. Working intentionally to improve relationships between this community and healthcare workers will ideally improve access to and quality of care resulting in the best oral health outcomes (Arhakis et al., 2017; Okunseri et al., 2008). Early childhood family education linking oral health to overall health could increase engagement in oral health services, which are often covered by public health programs (Clarkson Freeman et al., 2013). As Somali communities continue to grow, accessing oral health services represent an important and necessary service for supporting community health.

Trauma-Informed Care for Somali Families in USA

A trauma-informed care approach can increase success and engagement in preventative and restorative oral health services for Somali communities (Akinkugbe et al., 2019; Arhakis et al., 2017; Bradbury-Jones et al., 2019). Many Somali families in the United states are faced with a lack of culturally relevant oral health services that can

result in the perpetuation of trauma (Okunseri et al., 2008). Somali communities have been relocating to the United States since the early 1990's and many children have been born into or grown up immersed in American culture (Refugee Processing Center, 2020a). Due to the magnitude and complexity of the American healthcare system, past experiences held by children and adults can impact family engagement in the future health services, including oral health (Arhakis et al., 2017; Clarkson Freeman et al., 2013). This can have a supportive or adverse impact linked to the qualities of a family's collective experience (Akinkugbe et al., 2019).

Dental trauma experienced by any family member can negatively impact dental experiences and reduce engagement in oral health services (Arhakis et al., 2017). Adverse childhood experiences (ACEs) increase risk factors for negative health outcomes in adulthood (Akinkugbe et al., 2019). Specifically, ACEs increase factors associated with poor oral health outcomes, such as likelihood to smoke and obesity (Akinkugbe et al., 2019). Therefore, experienced physical or emotional trauma can create psychological barriers that prevent families from accessing services and degrade oral health (Akinkugbe et al., 2019; Bradbury-Jones et al., 2019). Childhood trauma and poor oral health outcomes are linked, and the oral health needs of vulnerable children are not consistently met (Bradbury-Jones et al., 2019). Increased education and awareness of services would be most beneficial from a trauma-informed perspective. Patient education provided by trauma-informed healthcare workers specifically addressing oral health is a potential strategy to improve engagement with oral health services and routines at home (Ramos-Gomez, 2019).

Oral Health Patient Education

Oral health education and awareness starts at home but continues in clinic. Despite improvement in oral healthcare initiatives in America, ECC is still the most common chronic disease of childhood particularly for children of disadvantaged socioeconomic status or ethnicity other than white (Fisher-Owens, 2007). Family education related to oral health outcomes can significantly increase engagement with oral health services and improve pediatric oral health outcomes (Ramos-Gomez, 2019). Coordinated and informed team approaches can determine gaps in family dental care education and coordinate resources to reach at-risk families and reduce ECC if implemented properly (Brailer et al., 2019; Herndon et al., 2015; Musselman, 2020; Ramos-Gomez, 2019; Vermaire & van Exel, 2018).

Team approaches to dental care may invest in community group education settings to provide oral health patient education (Albino & Tiwari, 2016). This may include a classroom model of direct teaching from a dental expert with time for questions and answers. Evidence suggests successful group models also utilize educational motivational interviewing groups and a counseling approach that is person-centered (Gao et al., 2015; Wu et al., 2017). This model appears to promote health literacy (the ability to obtain, read, understand, and apply knowledge of healthcare) and directly improves oral health outcomes (Center for Disease Control and Prevention, 2019). Interestingly, recent research shows low and high health literacy to be associated with positive health outcomes for Somali refugee communities, while moderate health literacy is linked to poorer health outcomes (Geltman et al., 2014). In part, poor health outcomes associated with moderate health literacy is thought to be associated with an adoption of less favorable western dietary practices more common in

the same populations scoring moderately for oral health literacy (Geltman et al., 2014). This correlation emphasizes the importance of considering both health literacy and acculturation in patient education practices.

The most effective patient education models for Somali refugees emphasize reducing refined sugars, routine teeth cleaning with Western products or the retention of beneficial traditional practices and linking oral health routines with spiritual rituals (Geltman et al., 2013). Cleaning your teeth before prayer is an example of linking oral health routines (Geltman et al., 2013). Recognizing that these recommendations are rooted in and strengthened by an interdisciplinary approach can improve access to patient education and oral health services (Braun & Cusick, 2016; Falk-Kessler, et al., 2005).

Common preventative and restorative oral health services, such as anticipatory education and fluoride treatments, are linked to improvements in both oral and overall health (Braun & Cusick, 2016; Casamassimo, et al., 2009). Innovative and community-based education programs rooted in motivational interviewing have been shown to be more effective than prevailing health education strategy in eliciting positive changes in adolescents' oral health behaviors and preventing dental caries (Albino & Tiwari, 2016; Gao et al., 2015; Wu et al., 2017). Social supports and community networks further support positive oral health outcomes and create inroads for collaboration with communities at risk for negative SDH (Fisher-Owens, 2014; Geltman et al., 2013). Ideally, coordinated efforts will be made across medical and dental health professionals to ensure competence in ability to deliver oral health education that is interdisciplinary, holistic, and rooted in community values and beliefs (Albino & Tiwari, 2016; Behar-

Horenstein et al., 2017; Coopman, 2001; Fisher-Owens, 2014). Occupational therapists and community health professionals are key players in advocating for families, streamlining access to resources, and innovating delivery of patient education in a way that is compatible with the interests of children and families (Falk-Kessler, et al., 2005; Mouradian et al., 2007). Interdisciplinary approaches can more quickly identify gaps and coordinate resources to reach at-risk families and reduce ECC if implemented properly (Brailer et al., 2019; Herndon et al., 2015; Musselman, 2020; Ramos-Gomez, 2019; Vermaire & van Exel, 2018).

Interdisciplinary Collaboration

An interdisciplinary approach can broaden opportunities for oral health family education and increase access to necessary preventative and restorative oral health interventions (Braun & Cusick, 2016; Falk-Kessler, et al., 2005). Teamwork is not a novel concept in healthcare, though it often remains a goal rather than a universal reality due to a lack of shared decision making (Coopman, 2001; Falk-Kessler, et al., 2005; Whitehouse, 1951). Collaboration is imperative for health workers with the shared goals of increasing efficiency in production, access to and quality of services, and rooting practice in evidence (Coopman, 2001; Falk-Kessler, et al., 2005).

Interdisciplinary teams consist of professionals working collaboratively to create goals, develop a plan of care, and problem solve (Falk-Kessler, et al., 2005). Experts from any field may be called to work on an interdisciplinary team, though services may still be delivered discretely between disciplines (Falk-Kessler, et al., 2005).

Interdisciplinary teams working on oral health initiatives blend dental and medical experts and may include dentists, dental hygienists, community health workers, primary

care physicians, nurses, and occupational therapists (Braun & Cusick, 2016; Falk-Kessler, et al., 2005). In order to reduce ECC's and improve oral health outcomes for at-risk children, it is important to leverage the expertise within professionals on this team in creative ways that help make community resources more accessible (Braun & Cusick, 2016, Geltman et al., 2013). Increasing access to services alone is not enough to eliminate oral health disparities; community health workers, social workers, and occupational therapists may act as an important bridge between the healthcare system and the populations it is trying to serve (Mouradian et al., 2007). Accessing services is only impactful if the services are meaningful and integrated in family routines and rituals (Geltman et al., 2013; Mouradian et al., 2007; Okunseri et al., 2008). Occupational therapists are experts in analyzing routines and environments to encourage independent completion of activities of daily living, such as oral hygiene tasks (Falk-Kessler, et al., 2005). This perspective can augment patient education by analyzing family environment and perspectives to improve engagement and investment in oral health care (Mouradian et al., 2007; Geltman et al., 2013).

Developing an interprofessional collaboration between dental and medical providers creates a precedence to expand access to dental care; community workers inform and coordinate how families actually receive this care (Braun & Cusick, 2016; Mouradian et al., 2007). It is imperative that interdisciplinary oral healthcare fosters accountability for cultural competence and social responsibility (Behar-Horenstein, Warren, Dodd, & Catalanotto, 2017; Falk-Kessler, et al., 2005). Interdisciplinary teams help develop novel solutions, including alternative care delivery models that can provide dental services in unique environments (Braun & Cusick, 2016). Providing oral health

services in dental clinics, primary care, through telehealth, and strategically placed mobile clinics creates many opportunities to deliver evidence-based interventions to support positive oral health outcomes (Braun & Cusick, 2016; Fisher-Owens, 2007; Wu et al., 2017).

Conclusion

To successfully alleviate oral health disparities in the United States for Somali families, we must be deliberate in our intention to 1.) emphasize the link between oral health and overall health; 2.) promote health and wellness, rather than just absence of disease; 3.) empower families and communities through education and collaboration; and 4.) normalize innovate oral care delivery models that reach beyond access to care to embrace multifactorial, culturally competent, community-based models (Falk-Kessler, et al., 2005; Mouradian et al., 2007). Barriers to oral health awareness include lack of access to care, lack of time, and competing priorities which can be mediated through inventive care delivery models (Braun & Cusick, 2016). Oral health care is most effective when delivered in a trauma-informed, culturally competent, community-based way (Akinkugbe et al., 2019; Arhakis et al., 2017; Behar-Horenstein et al., 2017; Geltman et al., 2013; Mouradian et al., 2007; Okunseri et al., 2008; Ramos-Gomez, 2019). Consideration of specific community needs may increase the likelihood of engagement and impact of oral health services (Falk-Kessler, et al., 2005; Mouradian et al., 2007).

Appendix B: Needs Assessment

Community Walk/Drive Observation

Observer Name: _____

Site: _____

Neighborhood: Community Demographics:

Population:

Median income/unemployment rate:

Crime rate in 2015:

Housing (public, apartments, houses, etc.):

Children with family with below poverty line:

SWOT Analysis

Strengths	Weaknesses
Opportunities	Threats

Summary of Strengths/Weaknesses: *Internal factors include your resources and experiences. General areas to consider:*

Summary of Opportunities/Threats: *These are external factors stemming from community or societal forces. General areas to consider:*

Appendix C: Oral Health Video Module Survey

**Note this was distributed via email through an anonymous link to a Qualtrics Survey

You are invited to participate in this research project because you are participating in the “Using an Interdisciplinary Health Care Team Approach” grant funded to St. Catherine University in partnership with Ready, Set, Smile through Delta Dental of MN. This project is being conducted by Stephanie de Sam Lazaro, OTD, OTR/L, Assistant Professor of Occupational Therapy at St. Catherine University. The purpose of this survey is to examine the teaching and learning methods and content within the oral health modules created for health care providers who are not licensed in dental health. The survey includes items about your perceptions of the teaching/learning methods used in the online modules and your understanding of the content presented in the modules. The data that we collect from these surveys will assist in developing updates and modifications to the online learning modules. The data will be used to disseminate recommendations for use of integrated interdisciplinary teams to support primary health care outcomes for children. Each survey will take approximately 5 minutes to complete.

Your responses to this survey will be confidential and results will be presented in a way that no one will be identifiable. Confidentiality will be maintained to the degree permitted by the survey technology used, Qualtrics. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Your participation is voluntary and your decision whether or not to participate will not affect your relationships with the researchers, Dr. de Sam Lazaro, any graduate OT courses, Ready, Set, Smile, or St. Catherine University. If you decided to stop at any time you may do so. You may also skip any item that you do not want to answer. If you have any questions about this project, please contact Stephanie de Sam Lazaro, OTD, OTR/L, 651.690.6622; sldesamlazaro@stkate.edu or the Institutional Reviewer Board Chair: John Schmitt, PT, PhD, 651.690.7739; jsschmitt@stkate.edu. By responding to items on this survey you are giving us your consent to allow us to use your responses for research and educational purposes.

1. Enter the last 4 digits of your phone number
2. Select your profession
 - Occupational Therapy
 - Community Health Worker
3. Which Module are you responding about?
 - Module 1
 - Module 2 Part 1
 - Module 2 Part 2
 - Module 3 Part 1
 - Module 3 Part 2

- Module 4 Part 1
 - Module 4 Part 2
 - Module 5 Part 1
 - Module 5 Part 2
 - Module 6 Part 1
 - Module 6 Part 2
 - Module 7 Part 1
 - Module 7 Part 2
 - Module 8 Part 1
 - Module 8 Part 2
 - Module 9 Part 1
 - Module 9 Part 2
4. What aspects of the teaching method used in the online module worked well for you?
 5. What aspects of the teaching method used in the online module could be improved to help your learning?
 6. Name 1-2 key pieces of information that you know now that you didn't know before participating in the online learning module.
 7. Name topics or information that you would like more information about that were either not covered or not covered in the depth you needed within this module.
 8. Provide any additional feedback on this online module.

Appendix D: Journal Prompts

1. Journal prompts to complete after viewing each Oral Health Education Module:
 - What did you already know?
 - What did you learn?
 - What questions do you still have?
 - How can you use this information as an OT?
2. Journal prompts after each meeting with RSS:
 - What was your role in today's meeting?
 - What did you learn?
 - What contributions did you provide?
 - What feedback did you receive (constructive and positive)?
 - What went well?
 - What might you change or improve for the future?
3. Journal prompts related to COVID-19:
 - How has the pandemic changed your view of the project activities?
 - How may we continue to work towards the outcome of improving the oral health of children and families through telehealth or other mechanisms during the COVID-19 pandemic?
 - As the focus has become prevention of the spread of COVID-19, what other aspects of overall health and wellness and health promotion and prevention are important during this time and how can we as OTs be a part of this work?
4. Journal prompts for development of family materials:
 - What was your role in developing the materials?
 - What specific contributions did you make to the material development?
 - What feedback did you receive (from peers, RSS, and faculty)?
 - What went well in the development?
 - What would you change if you were to do this again?
5. Journal prompts before and after initial phone calls to families:
 - What went well with these calls?
 - What could have gone better during the calls?
 - What key learning or insights did you gain from connecting with families?
6. Journal prompts before and after the follow-up phone calls with families:
 - What went well with these calls?
 - What was challenging?
 - What did you learn about yourself and your role as a health provider through this process?
 - What did you learn from the families about their health needs?
 - Other insights/reflections on the process to indicate how you might modify the process for a future activity?

Appendix E: Tips for Terrific Teeth

TIPS FOR TERRIFIC TEETH!

 Brush teeth TWO times per day

 Brush teeth for two minutes

 Use toothpaste with fluoride

 Floss teeth ONE time per day

 Drink water from the tap

 Avoid sugary foods and drinks

 Only water in bottles at bedtime

 Eat a well-balanced diet

 Visit the dentist TWO times per year

 SMILE OFTEN!



Why is this important?

Following these tips will help prevent cavities, limiting pain, future oral diseases, infections, tooth loss, and expensive dental procedures.

Good oral health ⇔ Good overall health!!


Educational Handout Created by St. Catherine University Occupational Therapy Students (Delorianne Sander, Kersten Short, Ellen Soderberg, and Brittanee Despres) in collaboration with Ready, Set, Smile through funding provided by Delta Dental Foundation of Minnesota.

Tips for Terrific Teeth: Spanish Version

¡Consejos Para Dientes Saludables!


 Cepille los dientes DOS veces al día


 Cepille los dientes durante DOS minutos


 Use pasta de dientes con fluoruro

 Use hilo dental UNA vez al día

 Beba agua de la llave

 Evite los alimentos y bebidas azucarados

 Solo tomar agua a la hora de dormir

 Consuma una dieta equilibrada

 Visitar el dentista DOS veces al año

 ¡Sonríe a menudo!



Siguiendo estos consejos ayudará a prevenir caries, limitando el dolor, futuras enfermedades orales, infecciones, pérdida de dientes, y procedimientos dentales caros.

¡Buena Salud bucal ↔ Buena Salud general!!

Educational Handout Created by St. Catherine University Occupational Therapy Students (Delorianne Sander, Kersten Short, Ellen Soderberg, and Brittanee Despres) in collaboration with Ready, Set, Smile through funding provided by Delta Dental Foundation of Minnesota. Traducción por Yndra I Aguilar Chavez.

Appendix F: Happy Tooth and Sad Tooth

Game Board Side 1

Happy
Tooth!



WHAT FOODS AND HABITS MAKE TEETH HAPPY?

MATCH PICTURES OF FOODS AND ACTIVITIES THAT MAKE YOUR TEETH HAPPY HERE

Game Board Side 2

Sad
Tooth



WHAT FOODS AND HABITS MAKE TEETH SAD?

MATCH PICTURES OF FOODS AND ACTIVITIES THAT ARE BAD FOR TEETH HERE

Game Pieces

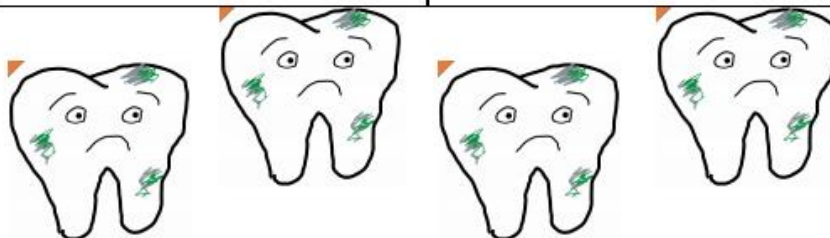


Answer Key English

NO - Food and habits for SAD teeth



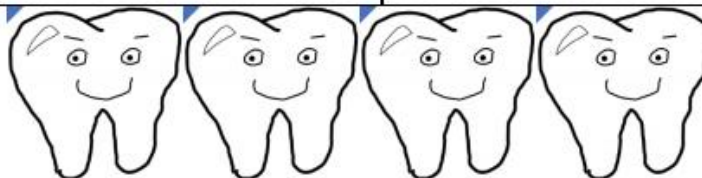
	<p>Sugary foods and drinks are bad for your teeth. REMEMBER... limit sugar in your diet!</p>		<p>Brushing too hard is bad for your teeth and gums. REMEMBER... brushing hard does NOT mean a cleaner mouth!</p>
	<p>An unhealthy diet causes sad teeth. REMEMBER... a healthy diet = a healthy mouth!</p>		<p>Being inactive is bad for your overall health. REMEMBER... good overall health = a healthy mouth!</p>
	<p>Going to bed with sugary drinks, including milk, is bad for your teeth. REMEMBER... drink tap water!</p>		<p>Unbrushed teeth attract germs and smell bad. REMEMBER... brush your teeth 2 times per day for 2 minutes!</p>
	<p>Snacking and sipping on sugary drinks all day can cause sad teeth. REMEMBER... limit sugary drinks and snacks between meals!</p>		<p>An unbrushed tongue attracts germs and smells bad. REMEMBER... Brush your tongue!</p>





YES - Food and habits for HAPPY teeth

 <p>Visiting a dentist every 6 months helps keep teeth clean and healthy</p>	 <p>Chewing sugar-free gum can help clean away germs</p>
 <p>Brushing teeth twice a day for 2 minutes cleans away germs for happy teeth</p>	 <p>Drinking tap water is the best drink for teeth, it rinses away germs</p>
 <p>Flossing teeth once a day gets rid of germs between teeth</p>	 <p>Eating vegetables helps clean away germs and makes teeth happy</p>
 <p>Drinking milk makes teeth strong and happy. (but no milk in bottle when falling asleep)</p>	 <p>Eating crunchy fruits helps clean away germs</p>



Answer Key Spanish

NO – Comida y hábitos para dientes tristes

English	Spanish
Sugary foods and drinks are bad for your teeth. REMEMBER... limit sugar in your diet!	Las comidas y bebidas azucaradas son malas para los dientes. RECUERDA... ¡Limita el azúcar en tu dieta!
Brushing too hard is bad for your teeth and gums. REMEMBER... brushing hard does NOT mean a cleaner mouth!	Cepillarse demasiado duro es malo para los dientes y encías. RECUERDA... ¡Cepillarse fuerte NO significa una boca más limpia!
An unhealthy diet causes sad teeth. REMEMBER... a healthy diet = a healthy mouth!	Una dieta poco saludable causa dientes tristes. RECUERDA... ¡Una dieta saludable = una boca sana!
Being inactive is bad for your overall health. REMEMEBER... good overall health = a healthy mouth!	Ser inactive es malo para la salud en general. RECUERDA... buena salud en general = ¡una boca sana!
Going to bed with sugary drinks, including milk, is bad for your teeth. REMEMBER... drink tap water!	Acostarse con bebidas azucaradas, incluida la leche en la noche, es malo para los dientes. RECUERDA... ¡Beba agua de la llave!
Unbrushed teeth attract germs and smell bad. REMEMBER... brush your teeth 2 times per day for 2 minutes!	Los dientes sin cepillar atraen gérmenes y huelen mal. RECUERDA... ¡Cepíllate los dientes 2 veces al día durante 2 minutos!
Snacking and sipping on sugary drinks all day can cause sad teeth. REMEMBER... limit sugary drinks and snacks between meals!	Comer y tomar bebidas azucaradas todo el día puede causar dientes tristes. RECUERDA... ¡Limite las bebidas azucaradas y los refrigerios entre comidas!
An unbrushed tongue attracts germs and smells bad. REMEMBER... Brush your tongue!	Una lengua sin cepillar atrae gérmenes y huele mal. RECUERDA... ¡Cepilla tu lengua!

Si – Comida y hábitos para dientes felices

English	Spanish
Visiting a dentist every 6 months helps keep teeth clean and healthy	Visitar el dentista cada 6 meses ayuda a mantener los dientes limpios y saludables
Chewing sugar-free gum can help clean away germs	Masticar chicle sin azúcar puede ayudar a limpiar los gérmenes
Brushing teeth twice a day for 2 minutes cleans away germs for happy teeth	Cepillarse los dientes dos veces al día durante 2 minutos limpia los gérmenes para tener dientes felices
Drinking tap water is the best drink for teeth, it rinses away germs	Beber agua de la llave es la mejor bebida para los dientes, enjuaga los gérmenes
Flossing teeth once a day gets rid of germs between teeth	Usar hilo dental una vez al día elimina los gérmenes ente los dientes
Eating vegetables helps clean away germs and makes teeth happy	Comer vegetales ayuda a limpiar los gérmenes y alegra los dientes
Drinking milk makes teeth strong and happy. (but no milk in bottle when falling asleep)	Beber leche hace que los dientes sean fuertes y felices (no le ponga leche en la botella cuando se duerma su hijo(a))
Eating crunchy fruits helps clean away germs	Comer frutas crujientes ayuda a limpiar los gérmenes

Traducción por Yndra I Aguilar Chavez.

Appendix G: Routine Tracker Resources

Routines Help Your Child Stay Healthy

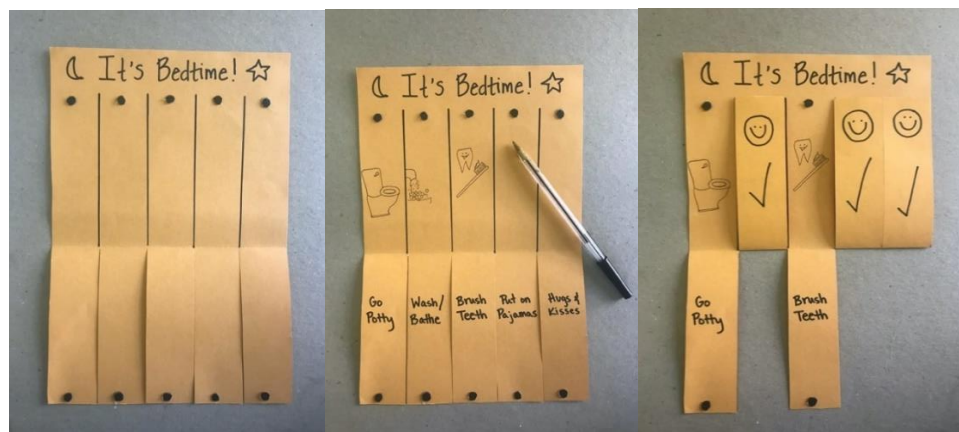
Many of the choices we make each day help us stay healthy if we do them every day! Brushing your teeth twice a day for two minutes is an important habit to build into routines, especially in the morning and at bedtime. There are lots of steps for your child to learn in their routine.

A visual schedule is an easy way to build healthy routines. It shows what tasks need to be done and helps your child learn. Tasks are different for each family and may include going to the bathroom, prayer, or reading a book. **We encourage all routines to include brushing teeth!** The schedule sets consistent expectations no matter which adult is in charge.

How to Create a Visual Schedule for Healthy Routines

You have one blank schedule with Velcro closures and colored pencils in your kit.

- Decide to create a morning or bedtime visual schedule. Talk with your child about what tasks are part of that routine. Together, choose the top five tasks.
- Write or draw each task in its own section on the top half of the schedule.
- Fold the bottom half of paper up to fasten the Velcro for each section. This shows that the task has been done. Add a check mark, smile, or any indication that it was done well on that side of the paper!



Using the Visual Schedule Daily

- Put the schedule where it's easy for family members to see and your child to use.
- Show your child how to use it. Explain how they can look at the schedule to remember what tasks are left and show you they did a task by closing each section.
- Encourage your child to use the schedule each day! Check it and give praise. Each day undo the closures and start again! It may take time, but you are encouraging your child to build healthy routines and independence as they grow.

Educational Handout Created by St. Catherine University Occupational Therapy Students (Colin Howe, Emily Bendelsmith, Taylor Anderson, and Jennifer Carlson) in collaboration with Ready, Set, Smile through funding provided by Delta Dental Foundation of Minnesota.

Routines Tracker Materials Spanish

Las rutinas ayudan a su hijo estar saludable

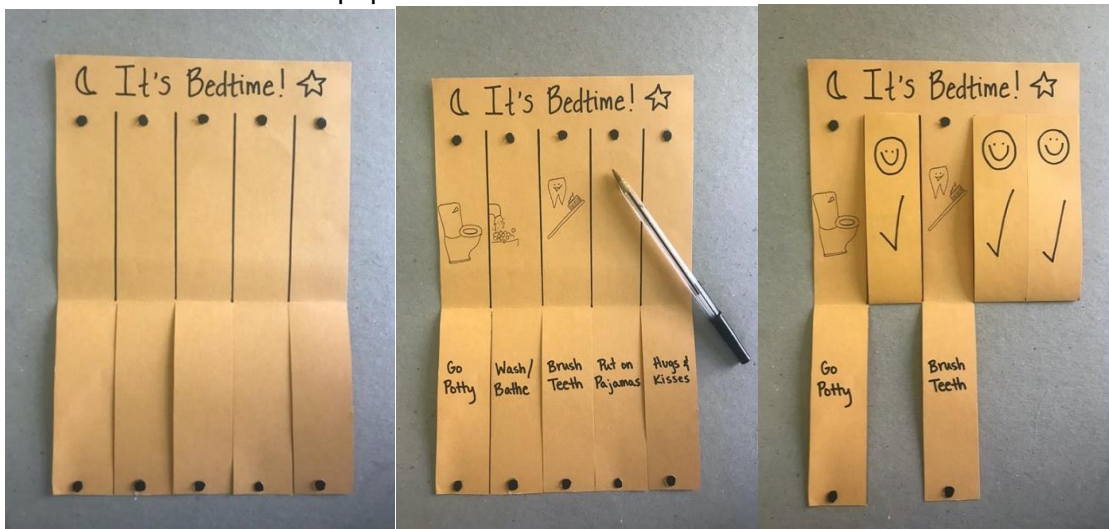
Muchas de las decisiones que hacemos cada día nos ayudan a estar saludables. Lavando nuestros dientes dos veces al día por dos minutos es un importante hábito que debemos incorporar en nuestras rutinas, especialmente en las mañanas y las noches. Hay muchos pasos para que su hijo aprenda en su rutina.

Un horario visual es una manera fácil de desarrollar una rutina saludable. La rutina enseña al niño/niña que las tareas deben hacerse y su hijo aprende. Las tareas pueden ser diferentes para cada familia y pueden incluir ir al baño, orar, o leer un libro. ¡Alentamos que todas las rutinas incluyan el cepillado de dientes! El horario establece expectativas constantes sin importar que adulto este a cargo.

Como crear un horario visual para rutinas saludables

Usted tiene un horario en blanco con cierres de velcro y lápices de colores en su kit

- Usted decida crear un horario de la mañana o de la noche. Hable con su hijo(a) de las tareas que son parte de la nueva rutina. Todos juntos elijan las cinco tareas principales.
- Escriba o dibuje cada tarea en su propia sección en la parte de arriba del horario
- Doble la parte de abajo para sujetar el velcro de cada sección. Esto muestra que la tarea se ha realizado. ¡Agregue una palomita, sonrisa, o cualquier indicación de que se hizo bien en ese lado del papel!



Usando el Horario Visual a Diario

- Ponga el horario donde sea fácil para que su familia vea y que su hijo(a) lo pueda usar.
- Enseñe a su hijo(a) a usar el horario. Explique como ellos pueden mirar el horario para recordar que tareas tienen que hacer y le mostrarle que hicieron una tarea cerrando cada sección.
- Anime a su hijo(a) a usar el horario todos los días. Cheque y alabe cuando terminen las tareas. ¡Cada día deshaga los cierres y comience de nuevo! Puede de que lleve tiempo, pero está animando a su hijo(a) a desarrollar rutinas saludables e independencia a medida que crecen.

Educational Handout Created by St. Catherine University Occupational Therapy Students (Colin Howe, Emily Bendelsmith, Taylor Anderson, and Jennifer Carlson) in collaboration with Ready, Set, Smile through funding provided by Delta Dental Foundation of Minnesota. Spanish translation done by Yndra I Aguilar Chavez.

Appendix H: Complete Packet Materials

Cover Letter English



Dear Family,

Enclosed in this packet are the materials from St. Catherine University and Ready, Set, Smile:

- Toothbrushes
- Dental floss
- Toothpaste
- A 2-minute timer
- Tips for Terrific Teeth resource
- Sad Tooth/Happy Tooth game and answer key
- Daily schedule maker and instructions
- Colored pencils
- Beach ball as a prize for your child for brushing their teeth

For more resources check out the [Classroom Curriculum \(CHW\)](#) under "training information" on the Ready, Set, Smile website. Expect your follow-up call, text, or email in 1-2 weeks.

We hope these resources are helpful for happy teeth and mouths for your child and family.

Thank you!

St. Catherine University Occupational Therapy & Ready, Set, Smile Team Members

This project is sponsored by Delta Dental Foundation of MN



Delta Dental of Minnesota

Cover Letter Spanish



Querida Familia,

En este paquete se incluyen los materiales de la Universidad de St. Catherine y Ready, Set, Smile:

- Cepillos de dientes
- Hilo dental
- Pasta de dientes
- Un contador de 2 minutos
- Consejos para recursos de Dientes Fabulosos
- Juego de dientes tristes/dientes felices y clave de respuestas
- Un horario diario e instrucciones
- Pelota como premio para su hijo por cepillarse los dientes

Para más recursos cheque [Classroom Curriculum \(CHW\)](#) debajo de "training information" en la página de web de Ready, Set, Smile. (www.readysetsmile.org). Espere su llamada, mensaje de texto, o correo electrónico en 1 a 2 semanas para dar seguimiento.

Esperamos que estos recursos sean útiles para tener dientes y bocas felices para su hijo(a) y su familia.

¡Gracias!

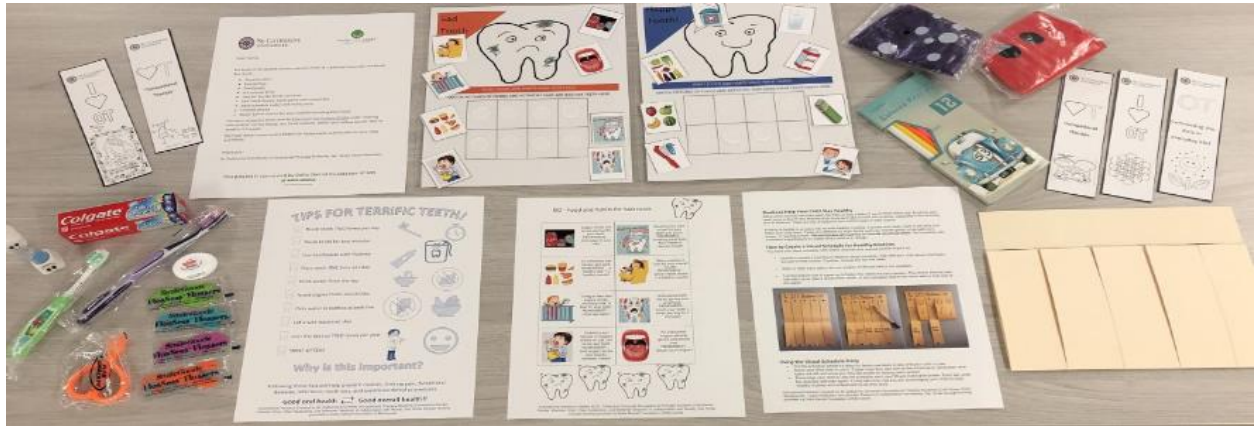
Terapia ocupacional de la Universidad de St. Catherine y miembros del equipo de Ready, Set, Smile.

This project is sponsored by Delta Dental Foundation of MN



Delta Dental of Minnesota

Traducción por Yndra I Aguilar Chavez.

Image of all Materials in the Packet and Link to Instruction Video[Family Educational Packet Instructions Video](#)

Appendix I: Project Presentation

Providing Oral Health Education to Underserved Children and Families within an Interdisciplinary Team

Presented by: Kiersten Anderson, Taylor Anderson, Emily Bendelsmith, Brittane Despres, Colin Howe, Jenny Leaser, Ellen Minor, and Delorianne Sander

Faculty Advisor: Dr. Stephanie de Sam Lazaro

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Learning Outcomes

1. Identify the importance of oral health interventions for children and families
2. Recognize the role of interprofessional teams in health and wellness education outcomes for clients
3. Describe the unique role OT can have in oral health care

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Project Introduction

- The health of our teeth and mouth influences our overall quality of life
- Nearly 50% of 2-19 year olds were diagnosed with dental caries (cavities) in 2015-2016
- Dental caries in early childhood are **preventable**
- Underserved communities do not receive adequate healthcare to address oral health concerns

(CDC 2019; CDC 2020; Dujister et al., 2015; Hamasha et al., 2006; Peres et al., 2007; Piovesan et al., 2010).

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Foundation for Community Partnership

- Ready Set Smile (RSS) provides oral health services to vulnerable populations, including children and their families
- RSS collaborated with St. Kate's OT students to provide interdisciplinary services
- OT's Impact
 - Poor oral health → decreased participation in meaningful activities
 - Use skills to address habits/routines, environmental changes, sensory concerns, and client & caregiver education and training

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(ADTA, 2014; Chandrashekar & Bommangoudar, 2018; de Jong-Lenters et al., 2019; RSS, 2020; Stein et al., 2014)

Literature Review - Foundational Knowledge

- Social determinants of health (SDH) play a significant role
- Oral health education → improved oral health
- Consideration of cultural values and norms
- Wide variety of strategies can be used to address oral health barriers
- An interdisciplinary approach is effective

(Bono, Rogo, & Williams, 2019; Duijster et al., 2015; Finnegan et al., 2016; Florindez et al., 2019; Healthy People 2020, n.d.; Mahewari et al., 2014; Stein et al., 2014)

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Oral Health Modules - Foundational Knowledge

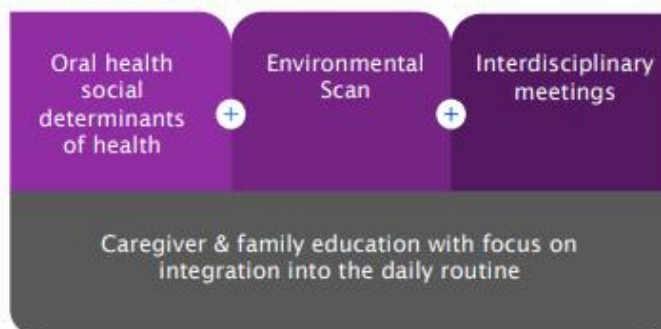
- 17 oral health modules on various topics
- Post-survey after each module



(RSS, 2020)

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Needs Assessment



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Family Education - Materials & Supplies

- Tips for Terrific Teeth
- Happy Tooth and Sad Tooth game
- Visual schedule
- Dental supplies
- 2 minute sand timer
- Miscellaneous items



(Dr. de Sam Lazaro, 2020)

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Family Education - Tips for Terrific Teeth

- Ten tips on oral health care
- Quick reference tool for parents and children
- Ensured it was useful for all ages and cultural backgrounds

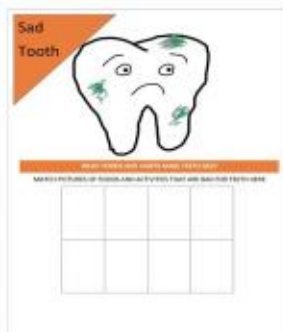


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Family Education - Happy Tooth, Sad Tooth Game



Example of game piece



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Family Education - Visual Schedule

- A visual tracker can help build healthy routines
- Sets clear expectations
- A blank template was sent to each family
- Template is customizable to each family's routine
- Routine is transferable to different caretakers

(AOTA, 2013)



(Howe, 2020)

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Assessment Methods and Results

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Assessment Methods

- Integrated Oral Health Team Member Pre- and Post-Project Survey
- Oral Health Modules Survey
- Oral Health Family Education Survey



(Untitled illustration of woman holding page of feedback survey, n.d.)
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Assessment findings related to **Interdisciplinary Learning**

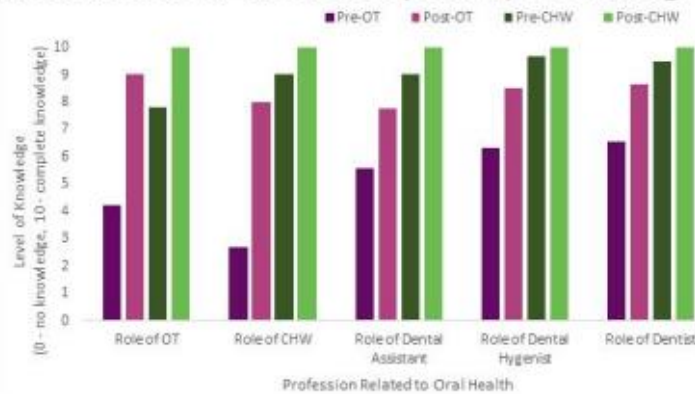
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Assessment Results: Interdisciplinary Learning

Pre- and Post-project survey on knowledge of professional roles

Self-report

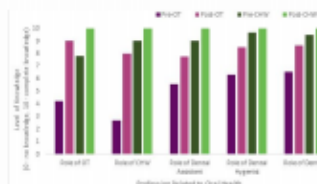
Means reported by role



Assessment Results: Interdisciplinary Learning

Pre: “learn” from “multiple perspectives” and “collaborate” by “working on a team”

Post: “robust knowledge” and cultural context that strengthened the development of “client centered” educational materials



Unforeseen challenges to communication, collaboration, and service delivery

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Assessment Results: Interdisciplinary Learning

	Pre	Post
Role of OT	<ul style="list-style-type: none"> • “Holistic” • General intervention approaches • “Very uncertain” 	<ul style="list-style-type: none"> • Specific project deliverables • Articulated strengths of OT domain <ul style="list-style-type: none"> ○ Supports and barriers across ecological levels ○ Motivation

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Assessment Results: Interdisciplinary Learning

	Pre	Post
Value of Inter-disciplinary Team	<ul style="list-style-type: none"> • +: learn from “multiple perspectives”, “collaboration” • -: role definition, getting to and staying on the “same page”, balancing specialities’ emphases 	<ul style="list-style-type: none"> • +: “robust knowledge” and cultural context strengthened “client centered” materials • -: Pandemic-related communication and service delivery

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Assessment findings related to
Oral Health Modules

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Assessment Results: Learnings From Oral Health Modules - Qualitative Data

Level II Themes

1) Increased knowledge of the dental profession

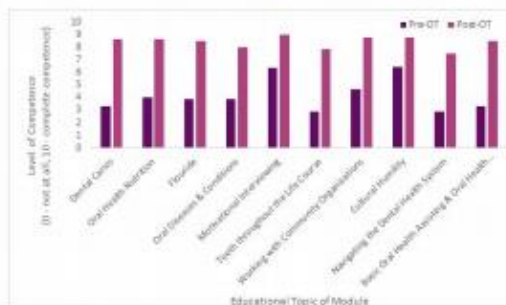
2) Increased knowledge of proper care of one's oral health

3) Increased knowledge on why to care about oral health

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Assessment Results: Learnings From Oral Health Modules - Quantitative Data

- All topics saw a rise in competency
- Largest rises in...
 - Dental Caries
 - Teeth Throughout the Life Course
 - Navigating the Dental System
 - Basic Oral Health Assisting and Infection Control



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Assessment findings related to

Oral Health Family Education

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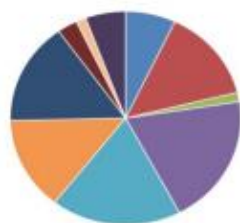
Assessment Results: Oral Health Family Education - Quantitative Data

- Dental supplies were most commonly used (66.67%) and most continually used (73.33%)
- Happy Tooth/Sad Tooth game was used the most frequently used activity (10.0%) compared to the daily schedule (3.33%)
- Participants reported use of materials at least once a day (n= 3)
- Children used materials the most
- Ease of activity and material use were very easy (n = 2), easy (n= 3), somewhat easy (n = 1)

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(Boustedt, Dahlgren, Twetman, & Roswall, 2019; Kumar et al., 2014; Maheswari et al., 2014; Roy et al., 2004)

Assessment Results: Oral Health Family Education - Qualitative Data



- Daily Schedule
- Happy Tooth/Sad Tooth Game
- Tips for Terrific Teeth
- Toothbrush
- Toothpaste
- Dental Floss
- 2 minute sand timer
- Beach Ball
- Bookmark
- Colored Pencils

Frequency of affirmative
comments related to
project materials from
families during survey
collection

(Roy et al., 2004)

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Recommendations

Advocate

- Profession
- Clients
- Families

Educate

- Self
- Clients
- Families
- Professionals

Collaborate

- Community partners
- Interdisciplinary teams
- Families
- Volunteers

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A special thank you!



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Appendix J: Contact and Consent Scripts for Caregivers

Initial Phone Script to Provide Resources:

Hello. My name is _____. I am a **Community Health Worker with Ready, Set, Smile/Occupational Therapy Student at St. Catherine University**. I am part of a project team that provided dental cleaning and screening activities at your child **(child's name)'s** school, **(school name)**. I am calling because during the dental care provided at **(school name)**, **(child's name)** was found to have _____ cavities. We would like to offer you and your family toothbrushing supplies and educational materials and activities to use in your home to support tooth and mouth health for **(child's name)** and your family. Would you be interested in having us mail these supplies and activities to your home?

If they say yes to materials:

Great. We will mail a package to your home in the next week. Can you please verify the best address for us to send this package? **(confirm address and record on the “Family Resource Calling Record Form”)**. We would like to send toothbrushes for your household. How many adults and how many children live in your home and what are the ages of your children, so we can send toothbrushes for everyone? **(collect and record on the “Family Resource Calling Record Form”)**. Are you willing to have us follow-up with you by phone or text message or email after you receive the package for us to check in to get feedback on how helpful it was for your child and your family AND to see if there are any additional resources you would like us to send you? **(if yes)** Would you prefer a phone call, text message, or email? **(obtain best contact information and record on the “Family Resource Calling Record Form”)**. Thank you, we will be in touch again in a couple of weeks through a **phone call/text message/email**.

(if yes to materials and no to follow up) Okay. Thank you for taking the time to speak with me today. You should receive the package in the next week coming to **(confirm address on the “Family Resource Calling Record Form”)**. We realize many families have experienced some difficulties in the past few months. Are there any other resources your family needs that we might be able to help you with? **(obtain information and record in other notes section in “Family Resource Calling Record Form”)** Ready, Set, Smile is also offering children and their families the opportunity to come to a dental clinic we are offering to get free exams and also treatments for children 14 and under. Would you be interested in making an appointment for your family? **(record response on the “Family Resource Calling Record Form” and share information in the “if they say yes to clinics” or “if they say no to clinics” as appropriate)**

If they say no to materials:

We realize many families have experienced some difficulties in the past few months. Are there any other resources your family needs that we might be able to help you with? Ready, Set, Smile is also offering children and their families the opportunity to come to a dental clinic we are offering to get free exams and also treatments for children 14 and under. Would you be interested in making an appointment for your family? **(record response on the “Family Resource Calling Record Form” and share information in the “if they say yes to clinics” or “if they say no to clinics” as appropriate)**

If they say yes to clinics:

We will give you a call soon to set up an appointment. Please reach out to the Ready, Set, Smile team at 612-721-6118 if you have any questions or oral health needs.

If they say no to clinics:

Thank you for taking the time to speak with me. Please reach out to the Ready, Set, Smile team at 612-721-6118 if you have any questions or oral health needs. Hope you have a wonderful day.

Follow-up Phone Script:

This is **(name)** from Ready, Set, Smile/St. Catherine University following up on the dental materials we mailed to you. We hope they have been helpful. **(wait for response as needed)**. Are there any supplies that you need or do you need help finding a dentist for your family? **(wait for response and if yes, collect information on what is needed/where to send and if dentist information is needed provide RSS number 612-721-6118 and they will work to find a provider for the family)**. Are you still willing to participate in a short survey to provide feedback on the materials and supplies that you received in the mail?

(If no) Thank you for your time and please reach out to Ready, Set, Smile at 612-721-6118 if your child or other family members have dental needs.

(If yes) Thank you. I am going to read a brief consent form about this survey. You have been invited to participate in this research project because after a dental screening, your child either has cavities or is at risk for developing cavities. This project is being conducted by Ready, Set, Smile and occupational therapy students and faculty at St. Catherine University. The purpose of this survey is to gain your feedback about the effectiveness of the mailed materials on improving your child and your family's oral health routine. The survey includes items about your child and your family's experience using the dental materials and activities. The data that we collect from this survey will be used for understanding the effectiveness of dental education materials and activities on improving a family's oral health routine. It will take approximately 5-10 minutes to complete. I will be entering your responses into an anonymous online survey tool so your responses will not be identifiable as coming from you in any way during the presentation of our results. Your participation is voluntary and your decision whether or not to participate will not affect your relationship with the researchers, your child's preschool, Ready, Set, Smile, or St. Catherine University. You may decide to stop at any time during the survey or skip any item that you do not wish to answer. If you have any questions you can contact the principal researcher, Stephanie de Sam Lazaro at 651-690-6622 or the Institutional Review Board Chair, John Schmitt at 651-690-7739. By responding to items on this survey you are giving your consent to allow us to use your responses for research and educational purposes. Do you have any questions? Are you willing to proceed with the survey? Thank you.

[Anonymous Reusable Survey Link](#)

The first page of the survey includes the consent form you have read above and does not need to be repeated.

Appendix K: Letter and Postcard Templates



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Dear Family,

Your child received dental cleaning and screening at their preschool between December 2019 and March 2020. At that time your child was found to have at least 1 cavity. We would like to mail you and your family toothbrushing supplies and educational materials and activities to use in your home to support tooth and mouth health for your family. We are offering follow-up calls, texts, or emails to get your feedback on these resources and to gather any additional needs from you. Ready, Set, Smile is also offering children and their families the opportunity to come to a dental clinic we are offering to get free exams and also treatment for children age 14 and under. If you are interested in any of these services, please select the boxes that you are interested in on the enclosed self-addressed postcard and mail it back to us.

Thank you!

The St. Catherine University Occupational Therapy and Ready, Set, Smile
Team Members

Participant # _____

Please send a packet of oral hygiene supplies and resources to my home address including _____ adult/teen and _____ child-sized toothbrushes.

Please call or text me at

or email me at

for a follow-up about the resource package.

Please contact me to schedule a dental clinic visit for my family.

To:

St. Catherine University – OT
2004 Randolph Ave. F-25
Saint Paul, MN 55105

Appendix L: Oral Health Family Education Survey

Electronic Survey Consent and Survey Questions (which will be sent via Qualtrics):

You are invited to participate in this research project because after a dental screening, your child either has cavities or is at risk for developing cavities. This project is being conducted by Ready, Set, Smile and occupational therapy students and faculty at St. Catherine University. The purpose of this survey is to gain your feedback about the effectiveness of the mailed materials on improving your child and your family's oral health routine. The survey includes items about your child and your family's experience using the dental materials and activities. The data that we collect from this survey will be used for understanding the effectiveness of dental education materials and activities on improving a family's oral health routine. It will take approximately 5-10 minutes to complete.

Your responses to this survey will be confidential through the anonymous survey link you used to enter this survey portal and results will be presented in a way that no one will be identifiable. Confidentiality will be maintained to the degree permitted by the survey technology used, Qualtrics survey tool. Specifically, no guarantees can be made regarding interception of data sent via the internet by any third parties.

Your participation is voluntary and your decision whether or not to participate will not affect your relationships with the researchers, your child's school, Ready, Set, Smile, or St. Catherine University. If you decide to stop at any time you may do so. You may also skip any item that you do not want to answer. If you have any questions about this project, please contact Stephanie de Sam Lazaro, OTD, OTR/L, 651.690.6622; sldesamlazaro@stkate.edu or the Institutional Reviewer Board Chair: John Schmitt, PT, PhD, 651.690.7739; jsschmitt@stkate.edu. By responding to items on this survey you are giving us your consent to allow us to use your responses for research and educational purposes. Proceed to the next arrow to begin completing the survey and acknowledge your consent to participate.

Caregiver Survey

- 1) Which items did you use? (Please check all that apply)
 - a. Daily Schedule
 - b. Happy Tooth/Sad Tooth Game
 - c. Tips for Terrific Teeth
 - d. Toothbrush
 - e. Toothpaste
 - f. Dental floss
 - g. 2-minute sand timer
 - h. Beach Balls
 - i. Bookmark
 - j. Colored Pencils

- 2) How often are you or your child using any of the mailed materials?
 - a. More than once a day
 - b. Once a day
 - c. Every other day
 - d. Once a week
 - e. Less than once a day
- 3) Who in your family used the materials and activities?
 - a. Your child(ren)
 - b. You
 - c. Your child(ren) and you
 - d. Other family members
- 4) Do you think you will continue to use the activities and materials in the future?
 - a. Yes
 - b. No
 - c. Not Sure
- 5) If yes to #4, which ones will you continue to use?
 - a. Daily Schedule
 - b. Happy Tooth/Sad Tooth Game
 - c. Tips for Terrific Teeth
 - d. Toothbrush
 - e. Toothpaste
 - f. Dental floss
 - g. 2-minute sand timer
 - h. Beach Balls
 - i. Bookmark
 - j. Colored Pencils
- 6) How easy was it to use the activities and materials you received?
 - a. Very easy
 - b. Easy
 - c. Somewhat easy
 - d. Somewhat difficult
 - e. Difficult
 - f. Very difficult
- 7) What did your family like about the activities and materials?
- 8) What didn't your family like about the activities and materials?
- 9) If we sent you more or different items to help care for your family's teeth, what else would you like to receive?
- 10) Have these materials and activities changed how your family cares for their teeth?
- 11) What did your family learn from the materials and activities?

Appendix M: Integrated Oral Health Team Members Pre- and Post-Survey

****Note:** Both surveys were distributed via email with an anonymous link to a Qualtrics Survey.

Pre-Survey

You are invited to participate in this research project because you are participating in the “Using an Interdisciplinary Health Care Team Approach” grant funded to St. Catherine University in partnership with Ready, Set, Smile through Delta Dental of MN. This project is being conducted by Stephanie de Sam Lazaro, OTD, OTR/L, Assistant Professor of Occupational Therapy at St. Catherine University. The purpose of this survey is to examine perceptions of interdisciplinary roles in oral health and knowledge and understanding of various concepts that are part of the grant funded project. The survey includes items about knowledge and understanding of team member roles and knowledge of concepts that will be used to educate children and families. The data that we collect from this survey will be used in a comparison to survey data collected at the end of the project. The comparison of data will be used to disseminate recommendations for use of integrated interdisciplinary teams to support primary health care outcomes for children. It will take approximately 10 minutes to complete.

Your responses to this survey will be confidential and results will be presented in a way that no one will be identifiable. Confidentiality will be maintained to the degree permitted by the survey technology used, Qualtrics. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Your participation is voluntary and your decision whether or not to participate will not affect your relationships with the researchers, Dr. de Sam Lazaro, any graduate OT courses, Ready, Set, Smile, or St. Catherine University. If you decided to stop at any time you may do so. You may also skip any item that you do not want to answer. If you have any questions about this project, please contact Stephanie de Sam Lazaro, OTD, OTR/L, 651.690.6622; slidesamlazaro@stkate.edu or the Institutional Reviewer Board Chair: John Schmitt, PT, PhD, [651.690.7739](tel:651.690.7739); jsschmitt@stkate.edu. By responding to items on this survey you are giving us your consent to allow us to use your responses for research and educational purposes.

1. Enter the last 4 digits of your phone number (this will be used to compare your pre-project and post-project responses) _____
2. Select your profession
 - a. Occupational Therapy
 - b. Community Health Worker
 - c. Licensed Dental Provider

- 3.** On the scale below please rate your level of knowledge on the following (1=no knowledge to 10=complete knowledge)

1 2 3 4 5 6 7 8 9 10

- a.** The role of the occupational therapy in oral health and wellness prevention and promotion
- b.** The role of the community health worker in oral health and wellness prevention and promotion
- c.** The role of the dental assistant in oral health and wellness prevention and promotion
- d.** The role of the dental hygienist in oral health and wellness prevention and promotion
- e.** The role of the dentist in oral health and wellness prevention and promotion

- 4.** On the scale below please rate your level of competence as defined by Merriam-Webster as “the quality or state of having sufficient knowledge, judgment, skill or strength” on the following (1=not at all competent to 10= complete competence)

1 2 3 4 5 6 7 8 9 10

- a.** Dental Caries
- b.** Oral Health Nutrition
- c.** Fluoride
- d.** Oral Diseases and Conditions
- e.** Motivational Interviewing
- f.** Teeth throughout the life course
- g.** Working with community organizations
- h.** Cultural humility
- i.** Navigating the dental health system
- j.** Basic oral health assisting and infection control

- 5.** Provide your definition/description of “an integrated interdisciplinary primary care team” (i.e. what does that term mean to you?)
- 6.** Provide your definition/description of “oral health and wellness” (i.e. what does that term mean to you?)

7. Provide a brief description of what you see as your profession's role in this project.
8. Provide a brief description of what you see as the other professionals' roles in this project.
9. On a scale of 1 to 10 with 1= no value and 10=high value rate the following:

Having all team members involved in this project (occupational therapy, community health workers, licensed dental providers) will provide _____ level of value to the oral health of children and families.

1 2 3 4 5 6 7 8 9 10

10. List your perceived benefits and challenges to accomplishing the project activities in an interdisciplinary team (i.e. what do you think will be the easiest and most challenging aspects of developing and implementing education and services for the children and families in this project?)

Post-Survey

You are invited to participate in this research project because you are participated in the "Using an Interdisciplinary Health Care Team Approach" grant funded to St. Catherine University in partnership with Ready, Set, Smile through Delta Dental of MN. This project is being conducted by Stephanie de Sam Lazaro, OTD, OTR/L, Assistant Professor of Occupational Therapy at St. Catherine University. The purpose of this survey is to examine changes in perceptions of interdisciplinary roles in oral health and knowledge and understanding of various concepts that were part of the grant funded project. The survey includes items about knowledge and understanding of team member roles and knowledge of concepts that were used to educate children and families. The data that we collect from this survey will be used in a comparison to survey data that was collected at the beginning of the project. The comparison of data will be used to disseminate recommendations for use of integrated interdisciplinary teams to support primary health care outcomes for children. It will take approximately 10 minutes to complete.

Your responses to this survey will be confidential and results will be presented in a way that no one will be identifiable. Confidentiality will be maintained to the degree permitted by the survey technology used, Qualtrics. Specifically, no guarantees can be made regarding the interception of data sent via the Internet by any third parties.

Your participation is voluntary and your decision whether or not to participate will not affect your relationships with the researchers, any graduate OT courses, Ready, Set, Smile, or St. Catherine University. If you decided to stop at any time you may do so. You may also skip any item that you do not want to answer. If you have any questions about this project, please contact Stephanie de Sam Lazaro,

OTD, OTR/L, 651.690.6622; sldesamlazaro@stkate.edu or the Institutional Reviewer Board Chair: John Schmitt, PT, PhD, [651.690.7739](tel:651.690.7739); jsschmitt@stkate.edu. By responding to items on this survey you are giving us your consent to allow us to use your responses for research and educational purposes.

1. Enter the last 4 digits of your phone number (this will be used to compare your pre-project and post-project responses) _____
2. Select your profession
 - a. Occupational Therapy
 - b. Community Health Worker
 - c. Licensed Dental Provider
3. On the scale below please rate your level of knowledge on the following (1=no knowledge to 10=complete knowledge)

1 2 3 4 5 6 7 8 9 10

- a. The role of the occupational therapy in oral health and wellness prevention and promotion
- b. The role of the community health worker in oral health and wellness prevention and promotion
- c. The role of the dental assistant in oral health and wellness prevention and promotion
- d. The role of the dental hygienist in oral health and wellness prevention and promotion
- e. The role of the dentist in oral health and wellness prevention and promotion

4. On the scale below please rate your level of competence as defined by Merriam-Webster as “the quality or state of having sufficient knowledge, judgment, skill or strength” on the following (1=not at all competent to 10= complete competence)

1 2 3 4 5 6 7 8 9 10

- a. Dental Caries
- b. Oral Health Nutrition
- c. Fluoride
- d. Oral Diseases and Conditions
- e. Motivational Interviewing
- f. Teeth throughout the life course
- g. Working with community organizations

h. Cultural humility

i. Navigating the dental health system

j. Basic oral health assisting and infection control

5. Provide your definition/description of “an integrated interdisciplinary primary care team” (i.e. what does that term mean to you?)
6. Provide your definition/description of “oral health and wellness” (i.e. what does that term mean to you?)
7. Provide a brief description of what you feel your profession’s role was in this project.
8. Provide a brief description of what you feel the other professionals’ roles were in this project.
9. On a scale of 1 to 10 with 1= no value and 10=high value rate the following:

Having all team members involved in this project (occupational therapy, community health workers, licensed dental providers) provided _____ level of value to the oral health of children and families.

1 2 3 4 5 6 7 8 9 10

10. List the benefits and challenges you experienced to accomplishing the project activities in an interdisciplinary team (i.e. what were the easiest and most challenging aspects of developing and implementing education and services for the children and families in this project?)

Appendix N: Oral Health Module Themes

1. Module 1
 - a. Importance of proper brushing and flossing techniques to prevent cavities and decay, and respondents appreciated the introduction to oral health topics.
 - b. Introduced new dental terminology and oral anatomy many are unfamiliar with including caries, Biofilm, Periodontia, and infectious disease.
2. Module 2
 - a. The oral health cavity is an ecosystem including many elements (i.e. bacteria, saliva, etc.) that influence oral health.
 - b. For these reasons, oral health habits and dental care affect the ecosystem and therefore oral health.
3. Module 3
 - a. High sugar content in American diets was shocking and more information was needed on alternative diets to replace or reduce sugar consumption
 - b. A balanced diet across the lifespan is important due to the impact on both oral and overall health, with particular emphasis on equitable food access for low SES families who are at higher risk for circumstantial nutritional deficiencies
4. Module 4
 - a. There are many oral health benefits to fluoride, and it can come from various sources including saliva, water, food, toothpaste, mouthwash, and baby formula, however, too much fluoride can lead to fluorosis.
 - b. At risk populations such as children with disabilities and individuals in rural areas could benefit from routine fluoride treatment, and it can be routinely applied in dental or doctor's offices. Participants were curious how this affects people without insurance.
5. Module 5
 - a. Lack of awareness of the variety of oral health conditions and how dental care isn't only for teeth (i.e. gums, etc).
 - b. Lifestyle factors contribute to the development of many of the oral health conditions mentioned in these modules.
 - c. Interest in learning more about risk factors suggests a potential desire to self-manage oral health.
6. Module 6
 - a. The OARS acronym was a useful tool in navigating and remembering the important principles used with motivational interviewing
 - b. More information on motivational interviewing is not needed as the survey respondents were confident in the use of MI to elicit behavioral change

due to their OT background; This is an area of strength OTs felt they brought to the team

7. Module 7

- a. Participants learned how important oral health is in pregnancy and infancy, and are curious to know more about education that is provided to pregnant mothers.
- b. Oral care is greatly impacted in people with dental anxiety, children with special needs, people with STDs, or drug/alcohol use, and they may have more unmet dental needs

8. Module 8

- a. The dental profession includes many sub-specialties and is moving towards a group-based approach.
- b. Many complications including anxiety, blood pressure, fear, phobias, etc. justify the need for a group-based approach.
- c. There are multiple disciplines that can and should be part of oral health promotion and OT should be considered part of the care team outside of the dental clinic.

9. Module 9

- a. Survey participants were surprised by out of pocket expenses related to dental care and the common lack of dental coverage for insured individuals
- b. Barriers to accessing dental care was important knowledge for survey participants who wanted to know more about community dental services that help increase access for low SES families

Appendix O: Student Learning and Reflections

Learning and Reflection: Kiersten Anderson

This project has benefited my professional development by enhancing my leadership skills. I have improved my leadership skills by educating other disciplines on occupational therapy via advocacy. Having advocacy skills as an occupational therapist is important because it is essential for the growth of the field. Additionally, this project enabled me to work on my communicating skills when collaborating with other professionals. I also worked on my communication skills by talking to families from diverse cultural backgrounds. Having good communication skills within an interdisciplinary team (including families) is important as an occupational therapist because is critical for best client outcomes. Other leadership traits that I gained from the project are being flexible in unpredictable circumstances and being able to adapt to change quickly. This is evident when the plan for the project changed significantly from educating families in person to remotely due to COVID 19. Being flexible and adaptable as an occupational therapist is important because often times treatment sessions do not go as planned and we have to “think on our feet” and use our creativity to overcome unpredictable situations.

This project has positively contributed to the advancement of occupational therapy practice. One way this project has contributed to the occupational therapy profession is by occupational therapy students educating other disciplines about occupational therapy’s role and value in healthcare. Many dental professionals and community health workers had minimal knowledge of occupational therapy. In order to advance the field of occupational therapy, it is critical to educate others about our role

and value in patient care. Additionally, the project contributed to current research related to oral health promotion and occupational therapy. Research in this area is scarce and in order to advance practice more research is needed. Furthermore, more research can increase occupational therapists' and other disciplines' understanding of how occupational therapy can positively influence clients' oral health. By improving understanding, it could lead to occupational therapists having more opportunities in practice to address clients' concerns related to oral health. Also, this project has contributed to expanding ways that occupational therapy can deliver services. COVID 19 has forced many professions to find creative ways to provide services remotely. For this project, not all families had access to internet due to limited resources so team members had to think of creative ways to educate families on oral health. Therefore, we decided to deliver educational materials and supplies to families via mail and it seemed to be effective in increasing families' oral health knowledge and habits. I believe that providing occupational therapy services remotely will expand due to COVID 19 and this project can provide valuable information on its utility.

This project aligns with the MAOT program's mission of "providing excellent entry-level education in occupational therapy based on occupational science and liberal arts foundation. The MAOT program prepares students to lead and influence occupational therapy practice in existing and emerging professional areas" (St. Catherine University MAOT Program, 2018, p. 10-11). One way this project related to the mission was by focusing on student education and science. Furthermore, this project contributed to students' knowledge in occupational therapy by doing extensive research related to social determinants of health, interdisciplinary approach, oral health

promotion, and occupational therapy to inform project activities. As occupational therapists, it is important to use science to guide interventions in order to provide the best services for clients. Another way this project relates to the MAOT program's mission is by preparing students to be leaders. As mentioned previously, I had the opportunity to expand upon my leadership skills by advocating for the profession, collaborating and communicating within an interdisciplinary team, and having to be flexible and adaptable during unpredictable situations. Lastly, this project has allowed students to influence the occupational therapy practice in an existing and emerging area. Students influenced the occupational therapy practice by increasing awareness of occupational therapy's role in oral health promotion and the benefits of occupational therapy oral health interventions. Overall, it is critical for occupational therapists to make an impact in occupational therapy practice in order to achieve optimal quality of life and well-being for clients.

This project also aligns with St. Catherine University's mission of integrating "liberal arts and professional education within the Catholic tradition, emphasizing intellectual inquiry and social teaching, and challenging students to transformational leadership. Committed to excellence and opportunity, St. Catherine University develops ethical, reflective and socially responsible leaders" (St. Catherine University MAOT Program, 2018, p. 10). One way the project relates to the mission is by adhering to the Catholic social teaching principles of priority for the poor and vulnerable as well as human dignity (St. Catherine University OSOT department, 2009). More specifically, students adhered to the principle of priority of the poor and vulnerable by serving families from low-income backgrounds and at risk for poor oral health. It is essential for

occupational therapists to adhere to this principle by being committed and dedicated to helping the most vulnerable. Additionally, when creating the educational materials students ensured that they were beneficial to families of all ages and cultural backgrounds by using simple language, visuals, and translating information to Spanish if needed, which aligns with the principle of human dignity. In practice, it is critical to demonstrate human dignity by providing holistic and client-cared care. Lastly, St. Catherine University's mission was carried out throughout the project by students demonstrating transformational leadership. Students demonstrated this by working together with other disciplines and implementing a shared vision of enhancing disadvantaged families' oral health via oral health education. Displaying transformational leadership in occupational therapy is essential for best client outcomes.

Learning and Reflection: Taylor Anderson

This project has taught me a lot and I've really enjoyed my time working on it over the last year. This project relates to the mission of the Master of Occupational Therapy program (MAOT), the mission of St. Catherine University, and Catholic Social Teaching. This project has also shown to advance occupational therapy practice and contribute to my leadership development skills as a student. I hope to continue to use the skills and knowledge I have learned throughout this project to facilitate and guide my career as an occupational therapist.

St. Catherine University Mission & Catholic Social Teaching

St. Catherine University mission statement and the Catholic Social Teaching guidelines relate to this project in many ways. St. Catherine's mission statement is "to educate students to lead and influence" (St. Catherine University, 2019, pp. 10). We demonstrated leadership during this project as evidenced by our ability to create the project activities (initially in-person, then switched to virtually), collaborate with other professionals, and carry out the project from start to finish. We influenced participants and families during the project as we provided underprivileged families with dental materials to promote good oral health. Families provided us with feedback following the project's completion and many of them stated how thankful they were to be provided with these supplies.

St. Catherine University has core values of community and social justice which I also feel were demonstrated during this project. The value of community was met during this project as we were able to give back to the community due to how we provided services to underserved communities within the Minneapolis area. The value of social

justice was also addressed during this project as we provided opportunities to underprivileged communities and families to receive care they previously did not have access to.

St. Catherine's Catholic social teaching objectives also relate to this project. The core values that relate most to this project include dignity of the human person, a call to family, community, and participation, rights and responsibility, and priority for the poor and vulnerable (St. Catherine University, 2020, p. 14). During the entirety of the project, RSS and occupational therapy students maintained the dignity of our participants as we all worked towards a common goal of promoting good oral health. We also maintained dignity of everyone's professions by respecting the importance of all roles that were played during the project. The objective of a call to family, community, and participation was addressed during this project as RSS and occupational therapy students worked together as a team to give back to Minneapolis communities. We also relied on participation from families in order to effectively carry out our project. Our ability to respect participants and giving them the right to refuse to participate shows that we addressed the Catholic social teaching objective of rights and responsibility. Lastly, we also addressed the Catholic social teaching objective of priority for the poor and vulnerable as we worked with participants in underprivileged communities allowing them the opportunity to have access to oral health materials promoting good oral health practices.

MAOT Mission

This project also relates to the St. Catherine Master of Occupational Therapy (MAOT) mission statement. The mission statement of this program is "to provide

excellent entry-level education in occupational therapy based on an occupational science and liberal arts foundation. The MAOT program prepares students to lead and influence occupational therapy practice in existing and emerging professional areas” (St. Catherine University, 2020, p. 11). This project provided me with many opportunities which addressed entry-level education in which I can continue to utilize as a practicing clinician. This project allowed me to influence occupational therapy practice in existing and emerging areas as it addressed an area of practice that isn’t as commonly known for occupational therapists to work with, oral health. By looking at this emerging area, I realized the importance behind proper oral healthcare and educating our clients on the benefits behind performing good oral health routines and habits. We also were able to influence the profession of occupational therapy by educating others on the role of occupational therapy in oral health.

Advancing OT Practice

This project has advanced occupational therapy practice as evidenced by the amount of knowledge gained from the results received and collaboration between various discipline areas. At the beginning of this project I didn’t know that occupational therapists played or could play such an integral part in oral health. However, through our partnership and collaboration with Ready, Set, Smile it was evident that everyone working on the project gained a greater understanding of what occupational therapy is and how it plays an integral part in oral health. Another unique role of occupational therapy is providing client centered care and providing education to clients to help enhance their quality of life. Occupational therapy practice can be advanced by occupational therapists educating their clients on the importance behind good oral

health. Occupational therapists can act as primary care providers, and it is important that we educate our clients on proper oral health care. Occupational therapists can also provide client centered care by looking at a client's routines and habits. Occupational therapists can advance occupational therapy practice by modifying or assisting in changing a client's routines and habits to promote good oral health. Continued collaboration with other disciplines, promoting good oral health habits, and providing education on the role of occupational therapy in oral healthcare can continue to advance occupational therapy practice.

Leadership Development

There were many opportunities provided during this project to assist with contributing to my leadership development skills. The first opportunity of this occurred during our first meeting with Ready, Set, Smile and other team members as we had to explain the role of occupational therapy to others, and also state how we felt occupational therapy can assist with oral health. This was one opportunity that helped me learn to advocate for occupational therapy as a profession and enhance my leadership development.

Communication is another quality that has enhanced my leadership development during this project. Throughout the project there were many opportunities to engage with other professionals, peers, participants, and faculty which has provided me the chance to increase my professionalism and enhance good communication skills. I've been able to gain confidence in knowledge I am discussing with others regarding the project as my knowledge grew on the topic of oral health and I was able to grasp a good understanding of our project. The final presentation at the end of the semester also

helped show my confidence in teaching others the information I learned throughout the project. COVID-19 pandemic has also challenged my communication skills as we were required to complete the end of the project virtually, and it was important to keep in good communication with other team members, peers, and faculty without being able to meet in person. Phone calls to participants were another example of how my communication skills were enhanced.

Creativity is another leadership skill that has been challenged and increased during this project. Due to the pandemic, our project model needed to change, and I was able to adapt and change my mindset to help team members creatively think of new ways to deliver our project through a virtual format. Lastly, receiving both constructive and positive feedback from peers, faculty, and participants has helped grow my leadership skills as it challenged me to be able to accept feedback and change to make more positive outcomes. This project has given me many opportunities for leadership development.

Overall, I can't believe we have made it this far into this project and I am extremely proud of what my team members, other professionals, and I have put together. I look forward to utilizing the information and skills I have developed over the course of creating this project to help me increase awareness and stress the importance behind good oral health care and interdisciplinary collaboration while working as an occupational therapist.

Learning and Reflection: Emily Bendelsmith

Leadership Development

Throughout my time in the Master of Arts in Occupational Therapy (MAOT) program, my leadership skills continued to gradually develop. This project created many leadership opportunities for students. With COVID-19, we had to rely on communication with both our peers and our community health partners. This gave me an opportunity to initiate more project ideas while collaborating with the team members. Not every team member was knowledgeable on the role of occupational therapy within an oral health team, which pushed me to be a bigger advocate for my profession and initiate discussions with our team members on our role. As a part of our project, we called family members to ask about their interest in receiving oral health materials. This task was out of my comfort zone, but it encouraged me to improve my communication skills, confidence, and actively listen to the client's needs. As I venture off into my career as an occupational therapist, the skills I have gained from this project will greatly influence my ability to take initiative, work with others, and create plans for my clients that are client-centered.

Advancing OT Practice

Prior to this project, I had very little knowledge on the role of occupational therapy in an oral health setting. When collaborating with community health workers and dental providers, it became clear that they were also unaware of how occupational therapy can contribute to their field of work. However, after working in collaboration with Ready Set Smile for many months, our team not only understood, but also valued the ways in which occupational therapy can address the unique needs in oral health care.

My understanding of our role in oral health care increased through the literature review, the oral health modules, the team member surveys, and our team meetings. When oral health care needs are being met, the client's overall quality of life is improved.

Occupational therapy is unique in providing care that is client-centered and occupation-based to promote the client's quality of life. Occupational therapy's impact in oral health care can include changing dental hygiene routines/habits, making environmental modifications in the home and dental office, addressing sensory needs, introducing coping skills for dental fear, providing caregiver education and training, offering community resources, and consulting and collaborating with dental team members. It is evident that other team members valued the role of occupational therapy in this partnership, which demonstrated the ways in which we can advance OT practice. As we continue to collaborate with oral health professionals, we can provide our unique knowledge, training, and skills to promote our profession in oral health and make our role more well known.

MAOT Mission

The MAT program's mission advocates for their students to use social justice as a driving factor in helping clients participate in their everyday meaningful activities. This project relates to the mission of the MAOT program in many ways. Firstly, much of our project focused on oral health disparities, social determinants of health, and providing services to underserved communities. Our project focused on health promotion in communities that do not receive adequate oral health education or services. Poor oral health is correlated with decreased participation in meaningful occupations. Our project attempted to address oral health barriers to increase oral health outcomes and

occupational engagement. OT students were given an opportunity to work in a rare specialty, use an interdisciplinary approach, and work in a community setting. I believe this project relates to the MAOT mission because we applied our OT knowledge and skills to advocate for our clients and promote overall positive health outcomes.

St. Catherine University Mission and Catholic Social Teaching

St. Catherine University's mission statement emphasizes the importance of leading and influencing, while the Catholic social teaching principles include life and dignity of the human person, a call to family, community, and participation, rights and responsibilities, option for the poor and vulnerable, the dignity of work and the rights of workers, solidarity, and stewardship (St. Catherine University, n.d.). Our master's project relates to both St. Kate's mission and Catholic social teaching principles. Our project had a large emphasis on family and community outreach, providing services to vulnerable populations, valuing and being in solidarity with our project participants. In this project, we utilized our appreciation of community, social justice background, ethical teaching, and our value of trust to guide our interactions with each other, team members, and project participants. I believe that this project has equipped us to be strong advocates for others, especially for members of marginalized communities. It has also encouraged us to approach community partnerships with a humanistic and collective attitude. Overall, I am grateful that this project pushed me to be a better student, team member, and advocate.

Learning and Reflection: Brittane Despres

Completing this project has contributed to my personal and professional growth in multiple ways. I have developed my leadership skills by working with the team made up of OT classmates, faculty advisor, and other professionals. By sharing my learning, research, and thoughts with the community health workers, classmates, and instructors, my communication and collaboration skills were strengthened (see Appendix P Master's Presentation Slides).

While COVID-19 caused many unforeseen challenges relating to this project, it also brought about a few positive outcomes. When the project had to shift from the initial in-person learning experience of dental visits at community-based sites to virtual experiences, it allowed for me to use my creativity and problem-solving skills. As a team, we were still able to come up with practical solutions to help meet families' needs, and it ended up with positive results. We used what we learned from our literature reviews as well as the Occupational Therapy Practice Framework to decide what was most important for the children and families (AOTA, 2020). That led us to develop materials that were engaging, game-based, and could be a part of families' daily routines. This allowed me an opportunity to use my background experience as an early childhood teacher when creating the "Happy Tooth, Sad Tooth" game. Having experience teaching oral health to children in my former school setting helped me consider the most beneficial images to use and how to set up the game board. I then practiced my leadership skills when communicating my thoughts to the OT student team. With the combined ideas of everyone, our shared vision came to life.

I will take what I learned as a student completing this project and use it in my career as an OT practitioner. I have a much better understanding of the impact that oral health plays on an individual's overall health. This understanding will help me provide holistic care that considers all factors of a person's life. If I am working with children, I will want to ensure the family has education on healthy oral habits and how to build oral care into their child's life. I will be able to share this information right away before even becoming a practitioner, as I can share it with my fieldwork educator in my pediatric setting. Spreading awareness to other occupational therapists and other professionals I work with will be a way to continue the interdisciplinary collaboration that was highlighted from this project. In the future, I will also seek out opportunities I can share this knowledge with others in the community.

This project aligns with the MAOT mission of leading and influencing the occupational therapy profession in emerging and existing program areas (St. Catherine University, 2018). Oral care is in the scope of practice of occupational therapy, and it deserves more attention. This project shed light on current research, possible intervention strategies, and areas for possible further research and development. It highlighted how much more involved occupational therapists could be in primary care with dentists and physicians, community-based programs, as well as school-based programs that include oral care. Utilizing a transdisciplinary approach would allow for role education, knowledge expansion, and resource development. This would make better occupational therapists, better dental professionals, better community health workers, and ultimately better serve the clients.

Looking more broadly beyond the MAOT program, his project also aligns well with the overall mission of St. Catherine University. St. Kate's mission includes leadership, innovation, intellectual inquiry, and social teaching (St. Catherine University, 2018). From building a partnership with Ready, Set, Smile, I learned about connecting with families in need of services. To do this, I had to gain a better understanding of the some of the communities they served. I was able to see one of the sites firsthand to get a sense of the populations served, and some of the challenges they might be facing. My team gathered information on social determinants of health, the impact they have in a person's life, and what we can do to make a positive change. By participating in this project, I will be a more socially responsible leader.

Lastly, this project matches principles outlined in the Catholic school teaching. One of the principles that is emphasized in this project's work is the priority for the poor and vulnerable (St. Catherine University, 2018). The population that we gave the oral care materials to was found to at risk and vulnerable due to a variety of factors. We used various outreach strategies and communication methods in hopes of helping as many of the children and families that we could, especially during the unpredictable times of COVID-19. While COVID-19 sometimes amplified differences that people may be facing, in a sense, it also increased solidarity. It made people consider what is most important and essential, and how in general those are the same for everyone. The need for food, shelter, health care, and education are paramount.

Overall, this was a very positive experience. I enjoyed the people I got to meet and work with along the way. I grew closer to my classmates, learned more about them and more about myself. Ideally, it would have been great to finish the project in person

and work more directly with the other professionals, but there was still a great amount of learning, no matter the platform. The ultimate goal of providing education and interventions to underserved children was met.

Learning and Reflection: Colin Howe

Participation in this project contributed to my leadership development due to the layers of collaboration and project execution skills required when working with multiple partners in a community setting over a substantial period. I developed a renewed appreciation for organizational skills as leadership qualities. The project involved the coordination of multiple groups (i.e., small group, OT group, RSS, school sites) and I benefited by proxy in observing Dr. de Sam Lazaro coordinate at a high level as the liaison to RSS and directly by working within the OT student large and small group.

Although I don't consider myself a disorganized person, this project pressed me to improve my organizational skills further due to its scope and duration. At first, it was simply for my benefit because keeping track of all the moving parts was daunting, but it evolved into a method for assisting collaboration within our OT groups. Throughout the project, I developed the habit of keeping notes during meetings and informal check-ins so that I would remember instructions, details regarding timelines, and delegation of responsibilities. I found that my note-keeping aided our OT large and small group progress because I was able to refer to my notes to provide additional context or verify information when questions came up. Also, I dedicated a note section for questions that struck me individually and us as a group to refer to Dr. de Sam Lazaro as needed. I believe these efforts assisted our OT student group meetings to be more efficient and productive throughout the project.

The task of crafting educational materials within our small group and working on the group portions of the portfolio strengthened organizational skills like setting an agenda, outlining deliverables, and delegating responsibilities with clear timelines.

Although these individual skills may sound basic, utilizing them all consistently for formal and informal meetings helped me stay on task, feel more confident about the direction of our efforts, and act more decisively. Additionally, the length of time of the project was a practical challenge because it required staying engaged with a project and topic for a more extended period than our typical semester-long assignments.

Ultimately, this project developed my potential leadership roles because I discovered how engaging and motivating working with interdisciplinary partners is in a community-based setting. I have always appreciated research but have vacillated in interest in participating because the image I had of it was solitary. However, working with partners in the community and interpreting data I could link to tangible human interactions with people in our metropolitan community made me feel more invested than I expected throughout the entire process and the possibility of future involvement more enticing and meaningful.

This project will advance the OT practice by contributing to examples of OT application in emerging fields and with interdisciplinary partners. As we learned in our literature reviews, there is limited research focused on OT and oral health. Simply engaging in this project adds to the effort to advance OT's domain into the oral health space specifically, and public health promotion and primary care fields generally. I hope this leads to OT's increased prevalence in public health frameworks for population-level interventions. The project also adds to literature and professional imaginations of future practitioners and researchers to consider OT's role as interdisciplinary partners. More specifically, the project's educational materials demonstrate examples of how OT can contribute to public health/primary care initiatives. The education materials considered

development and how gamification plays a role in engagement, the importance of embedding health recommendations into a person's temporal context through routine, and engaging motivation in caregiver education by altering attitudes on the importance of oral health and prioritizing adherence.

The project reflects the MAOT program's mission to "prepare students to lead and influence OT practice in existing and emerging professional areas" (St. Catherine's University, 2018, p. 10-11). The project provided hands-on experience creating educational materials for pediatric ADLs which is within the existing domain of OT, but pressed further into emerging professional areas of primary care (i.e. professional oral health), public health promotion, and non-profit community services. The project also provided the opportunity to collaborate with and learn from CHWs which was an impactful experience that shaped my consideration set of interdisciplinary partners beyond typical rehabilitation or hospital-based professions.

The project relates to St. Kate's mission to develop "ethical, reflective, and socially responsible leaders" (St. Catherine's University, 2018, pg. 10). The project context and literature review called on us to research social determinants of health-related to the topic, explore the societal inequities linked to oral health outcomes, and face the existence of inequities in our metropolitan area. The project portfolio and journal prompts created points of pause and reflection throughout the length of the project, and the structure of data gathering (e.g., pre- and post- survey, module feedback) provided measurable feedback on the changes that occurred over the duration.

The project also reflected principles of Catholic social teachings core to St. Kate's mission (St. Catherine's University, 2018). The overarching purpose prioritized the needs of the poor and vulnerable by addressing the oral health inequity that children from low-income households often experience. The project's objectives to provide oral health services and tools reflect the principle of rights and responsibilities of all people to have healthcare. The project's goal and methods of involving interdisciplinary partners to deliver culturally responsive services demonstrated the principle of the dignity of the human person. The research project exemplified Catholic social teachings, St. Kate's mission, and MAOT philosophy and improved my academic and future professional skills.

Learning and Reflection: Jenny Leaser

Leadership Development

Throughout this project, I have developed many skills that have improved my leadership style. In the past, I have typically taken a backseat when it came to leadership roles, as these situations make me uncomfortable due to my shy and quiet nature. However, throughout the course of this past year, I have seen a dramatic shift in my confidence when volunteering for leadership roles and an improvement in my overall comfort level with speaking in front of a group and having to role play. For example, recently in PBL, I volunteered to be the class facilitator. Reflecting on my first PBL session, I rarely contributed ideas and only ended up as the facilitator if everyone else had already had a turn. This project has also improved my communication skills, as we needed to have good communication to complete tasks and assignments, as well as stay updated throughout the COVID-19 pandemic. I developed professional communication skills, especially when approaching families about receiving resources from our group and feedback based on the resources provided. This experience, in particular, has helped shape me into a better healthcare worker, as an important part of OT intervention is initial evaluation and interviewing new clients.

Advancing OT Practice

This project can help advance OT practice into the dental field. Our profession focuses on addressing the client as a whole. We strive to provide holistic, client-centered care, and as we have learned throughout this project, dental health impacts overall health and one's ability to engage in meaningful occupations. With this knowledge, we can continue to partner with dental care programs to implement OT into

dental care, as this field continues to expand its scope of practice. This project also emphasizes the knowledge that OT students can gain from collaborating in dental care activities, as well as, watching learning modules about dental care topics. Though OTs cannot treat dental health in the traditional sense, they can provide unique opportunities for their clients to gain access to affordable dental care options and teach techniques to help make dental experiences more accessible and tolerable for clients experiencing sensory responses to treatment. For example, OTs can guide clients to more cost-friendly resources, provide education on good brushing techniques to reinforce good habits, and provide adaptive responses if a client experiences any sensory responses to the stimuli presented in a dental office. These practices that OT can offer, in collaboration with care provided by a dentist, can support oral and overall health, prevent health emergencies, and support client-centered care.

Relation to the Mission of the MAOT Program

The MAOT Program's mission follows closely to the mission of Saint Catherine University and the Henrietta Schmoll School of Health, in that they strive to prepare students to become entry-level occupational therapy practitioners. The program also emphasizes that students will lead and influence the profession in existing and emerging areas. I think this master's project has a clear connection with preparing students to lead and influence the profession into new, emerging areas. Currently, OT has little evidence to support working with the dental profession. This project will provide evidence for dentists to include OT as they move to expand their care team. This project also may help develop the MAOT curriculum for students to come. The data provided throughout this project indicates that OT students can gain

entry-level knowledge on dental health concepts, as well as indicates that children and families responded well to the OT student's contribution to this project, including the resources and activities provided in the packets sent to children and families located within our community.

Relation to the Mission of the Catholic Social Teaching & St. Catherine University

There are eight principles in the Mission of the Catholic Social Teaching offered at St. Catherine University: Dignity of the Human Person, Dignity of Work, Family, Community and Participation, Solidarity, Rights and Responsibilities, Stewardship, Priority for the Poor and Vulnerable, and Promotion of Peace (Department of Occupational Science and Occupational Therapy, 2009). St. Catherine University's mission is to inspire students to be ethical, reflective, and socially responsible leaders (Master of Arts in Occupational Therapy Program, 2018). This master's project directly correlates with many of the listed Catholic Social Teachings, including respecting the dignity of the families that collaborated with this project, allowing families the right to participate in the project's activities for their own well-being, prioritizing the needs of vulnerable populations, and showing solidarity in working with a diverse population group. These Catholic Social Teachings help students become ethical, reflective, and socially responsible leaders, because they require students to diligently consider many different concepts before making decisions that, as a leader, can impact a large audience. These principles also closely align with the values and ethics of the occupational therapy profession, indicating that this project adequately prepared OT students for their future level II fieldwork placements, as well as their future practice as a licensed occupational therapy practitioner.

Learning and Reflection: Ellen Minor

I have really enjoyed my time working on this project. This project and its results relate to both the mission of the MAOT program along with the mission of St. Catherine's University and Catholic Social Teaching. I will treasure the skills and information I have gained as a result. By spending countless hours developing and creating the materials for this project my leadership skills have greatly developed. Additionally, the information gained can be used to advance occupational therapy practice.

This project strongly relates to the mission statement of St. Catherine University and the mission statement of the Henrietta Schmoll School of Health. St. Catherine's University Mission statement is "to educate students to lead and influence" (St. Catherine University, 2020, pp. 10). This project greatly increased my education on oral health and health promotion, especially in under served populations. Additionally, the project influenced both me along with the families served by the project. It influenced me by developing leadership skills. I gained leadership by engaging and leading meetings with Ready Set Smile (RSS), developing materials to send to families, and engaging in phone calls with families. Additionally, the families served, in particular their oral health, was positively influenced by our project. According to the family surveys, many of the materials sent positively influenced the families' oral health care and routines.

Furthermore, the mission statement of the Henrietta Schmoll School of Health (HSSH) strongly relates to this project. The mission statement of the HSSH is "to educate diverse learners and engage clinical and community partners to influence

health, health systems, and health policy” (St. Catherine University, 2020, pp. 10). Our entire project was done in collaboration with a community partner, RSS. While engaging with RSS our project influenced health and health systems. In our collaboration with RSS we were able to positively influence the oral health of the families who were sent materials. Additionally, clinics were set up to influence the oral health system and allow families to receive oral health care needs that they otherwise would not be able to receive.

Another mission statement this project relates to is the Master of Arts in Occupational Therapy (MAOT) Program. The mission statement of this program is “to provide excellent entry-level education in occupational therapy based on an occupational science and liberal arts foundation. The MAOT program prepares students to lead and influence occupational therapy practice in existing and emerging professional areas” (St. Catherine University, 2020, pp. 13). Throughout this project, I continually learned information to better influence my entry-level education in occupational therapy which I can apply to my future career. Additionally, this project gave me a lot of practice working in an emerging practice area. It allowed me to work closely with the oral health system, a place OT is not commonly utilized. I was able to determine a multitude of benefits of engaging OTs in a practice setting that primarily focuses on oral health. I was also able to share my knowledge learned throughout the occupational therapy curriculum with professionals new to me, community health workers. By collaborating with this group of individuals, we were able to bring our own unique scopes on oral health to develop materials that would be most beneficial to the families that RSS serves.

Lastly, the project relates to the core values of St. Catherine's Catholic Social Teaching core values. Specifically, the core values that relate most to this project include dignity of the human person, family, community, and participation, rights and responsibility, and priority for the poor and vulnerable (St. Catherine University, 2020, pp. 14). Dignity of the human person was strongly kept through the entirety of the project as this was a foundation established with RSS at the start of the project. The right and duty for the occupational therapists and community health worker to seek the common good and well-being of the participants was always at the center of our work. Our goal throughout the project was to increase well-being through dental services and improved oral hygiene behaviors. The fact that people have a fundamental right to healthcare was also a source of motivation. Our project aimed at providing as many families with dental cleaning services as possible. Through our phone calls to families, many children were able to have dental work done that otherwise would not have gotten done. Lastly, our project focused on delivering services to those most at risk, including the poor and vulnerable families in the greater Minneapolis region.

As a result of this project, my leadership development has improved. My communication with project partners, peers, faculty, and participants greatly improved from the start of the project to the end. Part of the increase in communication is due to increased personal confidence. By engaging in meetings with RSS my confidence in talking during interprofessional meetings improved. Additionally, being a positive influence and supportive team member to my peers helped improve my leadership skills. My abilities to use quick and creative thinking was greatly challenged by the COVID-19 pandemic when our entire scope of the project was drastically changed. This

pressure allowed me to develop critical leadership skills, including quick and creative thinking needed when working under pressure. My feedback to peers and community partners along with positivity influenced my confidence in leading groups through projects. Lastly, the final presentation we gave to 94 individuals took a lot of courage, but also benefited my confidence and public speaking skills.

I look forward to this project advancing the occupational therapy practice. There are multiple ways I can see this information benefiting the occupational therapy community. The first advancement I see is including education on the importance of oral health and how to embed oral hygiene into routines in the occupational therapy curriculum. Currently, there is little to no education on these topics in the curriculum. Additionally, the results showed that families benefited from education on oral health and tools used to increase that knowledge in their children. Occupational therapists can be at the forefront of educating families on the importance and how to embed oral hygiene into daily routines. In the future, I think this project could expand to offering solutions for individuals who do not participate in oral care for a variety of reasons. Some of the solutions could be offering sensory supports during the cleanings or offering adaptive tools for individuals who are unable to use standard ones.

Overall, I am extremely proud of the work completed throughout this project. I look forward to using the information in my future career as an occupational therapist. Additionally, I look forward to seeing the collaboration of embedding oral health care into more occupational therapy sessions and reaching those most in need.

Learning and Reflection: Delorianne Sander

Reflecting on the process and outcomes of this project, oral health education was beneficial both for personal practice and for the families who received educational packets. It is additionally clear from our experience that occupational therapy can positively impact oral health outcomes for children and families and implicates oral health as an area for expansion of OT practice. Occupational therapists are known for their application to increasing ADL participation, which includes oral health routines, and IADL participation, which includes engagement with healthcare services and health management. This project created an opportunity to enrich understanding of oral health concepts and apply them to OT practice. Client-centered practice and improving quality of life are hallmarks of OT services. Understanding the impact oral health can have on overall health improved our ability to champion oral health care within the OT scope to remain client-centered and focus on quality of life for children and families.

Personal discussions stemming from creative inquiry associated with this project created an understanding of additional benefits to increased oral health awareness for OT practitioners. One discussion highlighted a link to dental procedures and opioid addiction for teenagers and young adults, as discussed by Gupta and colleagues (2018). Could OT play a role in promoting daily oral healthcare routines to minimize opioid exposure? Another discussion noted the high incidence of emergency room visits for uninsured families related to oral health concerns, linked to an increase cost and exposure to potentially dangerous anesthetics (Casamassimo, et al., 2009). Could OT “push in” to do community-based work with at risk populations to prevent costly and dangerous oral healthcare solutions? How can OTs promote oral healthcare to improve

quality of life for any client? Many OT practice areas could be enriched from advanced practitioner knowledge of oral health terminology and interventions. This is true across the lifespan for all individuals, including those with cognitive disabilities, physical disabilities, sensory processing disorders, mental health needs, and/or limited resources. OT practice inclusive of oral healthcare aligns with the OT Code of Ethics and the Catholic Social Teachings.

In keeping with the Catholic Social Teaching principles, our group was able to successfully promote priority for the poor and vulnerable by identifying families that would most benefit from our offerings and seeking their engagement (*Master of Arts in Occupational Therapy (MAOT) Student Handbook, 2020*). Dignity of the human person was upheld and expressed through the process of providing information and collecting feedback from families involved in the project. Our hope is that this increased a sense of solidarity between families, healthcare providers, and between disciplines. Respect and cooperation were embedded in the social fabric of our interactions between disciplines and with clients and contributed to the promotion of peace through our work.

Our project aligned with the mission and design of St. Kate's, HSSH, MAOT Program by promoting critical thinking, student leadership, and active engagement with skill development for students (*Master of Arts in Occupational Therapy (MAOT) Student Handbook, 2020*). Students were empowered by faculty support to make decisions, develop content, and deliver interventions to families through interdisciplinary work. In this collaborative learning process, students were able to continue building on previous knowledge gained in the program and demonstrate enhanced critical reasoning, problem-solving, and reflection on process outcomes. Above all, the value of diverse life

experiences was honored and upheld during the development of this project and certainly influenced how students made decisions to remain client-centered in meeting learning objectives. Student leadership development was noted in a discussion between students who contributed to this process and a confidence in our work was noticed and linked with enhanced leadership skills. It was humbling to have an opportunity to work with our community partners and families; It was motivating to lead work that impacted our communities and neighbors.

The successful collaboration between occupational therapy students and community health workers implies a benefit to interdisciplinary-based oral health interventions. It was certainly helpful to engage with professionals working in the real world from a student perspective and helped prepare us for the transition from students to professionals. It also expanded our concept of what interdisciplinary teams can achieve. Reflecting on the process of working in an interdisciplinary team as a student, I experienced a shift in engagement that accompanied large personal growth. There was a shift in experience from initial participation as a student, to engagement with other disciplines, and on to a burgeoning understanding of transdisciplinary partnership. By actively engaging in learning modules and face-to-face work (both in person and virtually) related to diverse disciplines, we were able to take ownership of our participation in developing and delivering holistic, client-centered interventions that transcended traditional disciplinary boundaries.

By engaging so deeply in this work, we were able to meet student learning outcomes for the MAOT program. These outcomes are specific to effective communication, leadership and collaboration, critical and creative inquiry, ethics and

social justice, and purposeful lifelong learning. One opportunity that the COVID-19 pandemic created was to build effective communication skills in the context of interdisciplinary research. This meant that team members had to be responsive, clear, and accountable for participating in virtual meetings and contributing to shared documents appropriately. This additionally built up leadership skills, including active listening, flexibility, and strategic planning. Critical thinking and creative inquiry.

Overall, the project was successful in developing higher-level practice skills for students while upholding the mission of the MAOT program, St. Catherine University, and aligning with Catholic Social Teachings. It was a vital opportunity for development of my personal practice and how I approach and promote oral healthcare with future clients with cultural humility and a client-centered approach. It has also influenced my goal to work with interdisciplinary teams in my own career and to promote a transdisciplinary, community-based approach.