Capstone for M.S. in Oral Health Sciences

Dental Therapists: A Viable Option to Bridge Access to Oral Care in Rural Maine

Name

Month and Year of Graduation

Abstract:

Maine's largest barrier to quality oral health is access to care. Maine has fewer dentists per capita than any other state in New England and is well below the national average (1). Moreover, almost two thirds of the state is located in rural areas, yet only 13.5% of the state's dentists are located in these regions (2). Both Alaska and Minnesota have similar dental disparities and have started Dental Health Aid Therapist (DHAT) programs in order to increase access to care in their states. These mid-level oral care providers can perform most reversible and limited irreversible services that dentist's normally provide. Some studies have shown that DHATs have helped areas improve productivity, reduce caries levels in children, decrease overall cost of care, and provide greater oral health educational outreach. While more studies need to be conducted to determine the effects that DHATs have on improving access to care in the U.S., they remain a viable option for bridging the gap between access to oral care in rural areas in Maine.

The Oral Health Care Status of Maine

Fewer people visit the dentist in Maine (65.3% of the population) than any other state in New England. In comparison, Massachusetts has 76.2% of its population making at least one annual visit (1). This can be attributed to a variety of reasons including poor access to care, low MaineCare (Maine's state Medicaid plan) reimbursements for dental procedures, and the state's aging dental care providers. Maine has 50 per 100,000 dentists per capita vs 61 nationally (1). Moreover, almost two thirds of the state is located in rural areas, yet only 13.5% of the state's dentist are located in these regions (2). Table 1 illustrates this mal-distribution as Oxford County, one of the most isolated counties in Maine, had only 2.25 dentists per 10,000 population in 2011 vs Cumberland Country which had 7.35 dentists per 10,000 population (3). These ratios will continue to decrease in rural areas as approximately 40% of Maine's dentists are on the verge of retiring, and won't be compensated by a sufficient influx of new dentists entering Maine practices (4). In addition, the average MaineCare participant has to drive an average of 21.3 miles in order to see a dentist (2). Many of these participants can't afford to make this drive if they have to take time off of work or find someone to care for their children in their absence.

Table 1. Actively Practicing Dentists/10,000 Population in Maine by County, November, 2011 This table illustrates the dental shortage in rural counties in Maine by comparing the number of actively practicing dentists/10,000 population in the state's 3 most rural counties (Oxford, Somerset, and Waldo) to the state's 3 most populated counties (Kenebec, Sagadahoc, and Cumberland). Adapted from The Center for Health Workforce Studies, 2011 (3).

County in Maine	Actively Practicing Dentists/ 10,000 Population
Oxford	2.25
Somerset	2.49
Waldo	2.58
Kenebec	6.47
Sagadahoc	6.80
Cumberland	7.35
State Total	5.07

Low MaineCare reimbursement rates can arguable be considered the greatest cause of lack of access to oral care in Maine. Maine ranks 34th for dental reimbursements in the U.S. and fewer than 30% of Maine's dentists accept MaineCare, stating that their practices would not be sustainable if they met the needs of every MaineCare participant that walked in their door (5). When patients are turned away, often times they only get their dental needs treated when their situation becomes dire. In a 2006 report, the Pew Center on the States reported that tooth related issues was the cause for 3,400 emergency room visits for Medicaid patients in Maine, costing the state $6.6 million on care that should have been preventable (6).

These barriers to oral care are not unique to Maine. Across the nation, less than 50% of children, under the age of five, saw a dentist in 2012. This statistic becomes increasingly significant as 58.6% of children between the ages of 5-17 have dental caries, five times more frequent than asthma, making it the most widespread infectious disease in our nation (7). Alaska and Minnesota, both of which have similar population distributions as Maine, allow Dental Health Aide Therapists (DHAT) to practice in their states to try and alleviate these oral disparities.

The Role and Training of the Dental Health Aide Therapist

More than 50 countries, including New Zealand, Australia, Canada, the UK, and the United States (although limited to Alaska and Minnesota), allow dental therapists to practice either under direct or indirect supervision of a licensed dentist (8). The DHAT program originated in New Zealand in 1921, and still continues to show improvements in providing access to care. A New Zealand Medical Journal publication in 1970 showed that the need for extractions in children had declined from 88.2% in the 1920s to 12.6% since the start of the program (9). Currently, 97% of children are treated by DHATs, and the country has one of the lowest dental decay rates in children (10).

DHATs have been compared to physician's assistants or nurse practitioners in the medical field. The later health care providers work under

supervision of a doctor, providing more basic care to patients and increasing productivity in the clinic. While the scope of practice for DHATs varies upon country or even state, their purpose is similar: to increase access to oral care. DHATs are allowed to perform most reversible dental procedures and limited irreversible procedures including screenings, sealant placements, tooth restorations (i.e. fillings), and simple tooth extractions. More complex treatments, including surgical care other than simple extractions, periodontal treatment, root canals, and orthodontic treatment are reserved for licensed dentists (11). Figure 1 shows the scope of practice for dental therapists in both Alaska and Minnesota.

	AK Dental Health Aide Therapist	MN Advanced Dental Therapist	MN Basic Dental Therapist
Evaluation and Preventive Services			
Examination/assessment/inspection	yes	yes	no
Dental radiography	yes	yes	yes
Provide, dispense, administer select medications	no	yes	no
Counseling	yes	yes	yes
Cleaning above the gum line	yes	yes	polish
Fluoride application	yes	yes	yes
Sealant placement	yes	yes	yes
Cleaning below the gum line (scaling)	no	no	no
Space maintainers	yes	yes	yes
Basic Restorative Services			
Temporary restoration/ART technique	yes	yes	yes (general supervision)
Isolation	yes	yes	yes (general supervision)
Injection of local anesthetic	yes	yes	yes
Tooth preparation (drilling primary and permanent teeth)	yes	yes	yes
Tooth restoration (filling primary and permanent teeth)	yes	yes	yes
Primary tooth SSC (preformed cap)	yes	yes	yes
Primary tooth pulpotomy (a nerve treatment)	yes	yes	yes
Surgical Services			
Extract primary teeth (uncomplicated)	yes	yes	yes
Extract permanent teeth (conditional uncomplicated)	yes	yes	no
Other surgical care	no	no	no
Advanced Restorative Services			
Periodontal treatment (gums)	no	no	no
Endodontic treatment (root canals)	no	no	no
Fixed prosthodontic treatment	no	no	no
Removable prosthodontic treatment	no	no	no
Orthodontic treatment	no	no	no
Adjunct Services			
Community level oral health programming and promotion	yes	yes	yes
Care coordination	yes	yes	yes
Population assessment	no	yes	yes
Research	no	yes	yes

Note: Level of supervision for AK Dental Health Aide Therapist and for MN Advanced Dental Therapist is general/collaborative. Level of supervision for MN Basic Dental Therapist is indirect except as noted.

Figure 1. Scope of Practice of Dental Health Aid Therapists in Alaska and Minnesota The scope of practice for DHATs can vary between states and countries. However, all DHATs can perform most reversible dental services. Original figure from Bailit et al. 2012 (11).

Similar to scope of practice, certification training can vary between programs. However, these programs all seem to provide future therapists with extensive training in both clinical knowledge and tactile skills. Alaska's two-year post-high school program is run by the Alaska Native Tribal Health Consortium (ANTCH) and "prepares [DHATs] to provide a limited scope of dental education, prevention, and urgent and basic restorative care" (12). The program prepares students with over 3,000 hours of training and concludes with a minimum 400 hour preceptorship with direct supervision by a dentist to assess their skills, clinical knowledge, and competencies. Recertification is mandated every 2 years as well as a requirement to take 24 hours of continuing education classes during the two year time period between recertification (9). Multiple studies have shown Alaska's Dental Health Aide (DHA) program has been shown to deliver care comparable if not better than that of their supervisors. One study showed that DHATs outperformed their supervisors on 2 out of 3 measures (13). Minnesota's program provides their DHATs with a similar scope of training, and can be completed as either a 4 year baccalaureate or 2 year master's program (11).

Both programs place emphasis on treating children as the federal guide to best practices, Bright Futures, "indicates that oral health care for young children needs to include risk assessment, screening, examinations, and anticipatory guidance for parents," all of which are in a DHAT's scope of practice (14). In addition to treating these children, DHATs act as dental educators for oral health

and hygiene. By educating children on proper care at an early age, they hope to reduce future needs for costly restorative treatments (14).

Alaska's Dental Health Aide Program

Alaska began its DHA program in 2003 with the help of the ANTHC and tribal health organizations. Motivation for the program was prompted by a study that found that 79% of 2-5 year old Alaskan Natives and American Indians had a history of tooth decay. The program was modeled after New Zealand's and its graduates are placed in rural locations that have limited access to a dental care provider (9). In the view of Southeast Alaska Regional Health Consortium's (SEARHC) dental director Dr. Tom Bornstein, "DHATs have a very specific role to play in the clinic: clean out decay and fill cavities. We didn't have enough horsepower to get routine fillings done. The DHAT fits in this niche" (12). The increased number of oral health care professionals that this program provides each year increases the number of people that can be treated across the expansive state. The therapists provide basic preventative and restorative services to the community, but also have the skills to refer out more advanced cases to their dental supervisors.

In addition to their clinical services, DHATs frequently visit community schools and organizations to give oral health education. Before a DHAT was stationed in a village on the Kuskokwim River, the closest dentist was 150 miles

away. The therapist claimed that lack of a dental IQ or education was the largest barrier to proper oral health in this region. When first stationed in the village, parents frequently came to her to have their children's teeth extracted as if it was a normal routine that all children go through. Another therapist, stationed in Nome, Alaska, has helped the local school to establish itself as a "no pop" zone and provides information to the town's residents on the importance of fluoridating the public water supply (12).

Before implementing the DHA program, one of the state's concerns was the relationship between dentists and their DHATs as well as the coordination of both their roles as oral health care providers. As stated before, there are a variety of practice settings that DHATs work in (see Table 2). In Alaska, DHATs are primarily located in a village medical/dental clinic and are supervised by a remote dental director (13).

Table 2. Dental Health Aide Therapist Arrangements at Varying Sites DHATs can practice in a variety of settings with different levels of supervision. Original table from J.D. Bader et al. 2011 (12).

SITE	PRACTICE SETTING	THERAPIST PRESENCE	SUPERVISION ARRANGEMENT
A	Hospital-based regional clinic, five dentists, eight operatories	Nearly full-time, limited travel to two villages	Clinic director, on site
B	Subregional medical/ dental clinic, four operatories	Primary posting, but eight to 12 weeks away at other villages	Dental director, remote
C	Village medical/ dental clinic, one operatory every two to three months	Itinerant, one week per month	Dental director, remote
D	Village medical/ dental clinic, two operatories	Itinerant, one week per month	Dental director, remote
E	Dental trailer adjoining medical clinic, two operatories	Full time	Dental director, remote

The primary modality of communication between Alaska's dentists and DHATs is via telehealth technology. When DHATs have questions for their supervisor concerning a patient or a complex procedure, they sort it out via phone. DHATs and dentists consult each other via phone on roughly a daily basis and sometimes even an hourly basis. More established locations also have the ability to send electronic patient records and charts between the two sites so the dentist and DHAT can collaborate on a treatment plan. In addition to telehealth communication, often times the dentist visits the remote site every few months and can assess the skills of the DHAT and evaluate his or her competencies with certain procedures. In general, this arrangement is agreeable for both parties and allows for both collaboration on cases and review of competencies (12).

Opposition to Using Dental Health Aide Therapists

One of the biggest opponents of incorporating DHATs into the dental workforce is the American Dental Association (ADA). Julie Stitzel, manager of the Pew Children's Dental Campaign, states that "The No. 1 obstacle [against licensing dental therapists] has been organized dentistry" (15). The ADA cites insufficient training and education as their primary objection to the utilization of DHATs. In general, the organization believes that DHATs won't have sufficient education to understand disease etiology, which could lead to misdiagnosis and

development and implementation of improper treatment plans (10). Theirs is an argument of second-class care versus first-class care, which, according to the president of the ADA, Robert Faiella, first-class care can only be provided by someone who has had the training of a dentist (15).

Opposition to DHATs is not solely an organizational one. Even in Maine, a state that is currently voting on whether to allow DHATs to practice, many of the state's dentists oppose the addition to DHATs to the dental work force. These dentists who take this stance claim that Maine, in fact, does not have an access to care problem and would not benefit from such addition. Many Maine dentists believe that the root of the issue is the poor reimbursement rates of the state's MaineCare dental insurance while others say its just getting people to come to the dentist in general (16, 17). Others would like to wait to see where The University of New England's new dental school graduates will practice, to see if they decide to work in Maine's rural areas (1).

Proponents of Dental Health Aide Therapists

Not all dentists are opposed to the idea of DHATs. A survey conducted of Deans of U.S. dental schools found that 74% of the deans who replied thought that "the use of 'mid-level' practitioners or 'expanded duty' dental hygienists would improve access to dental care," and 55% viewed DHATs in a favorable light (18). In Alaska, many of the dentists state that the dentist-DHAT relationship

increases overall productivity and efficiency as DHATs can handle the simple cases, leaving the dentist with more time to spend with each patient and focus on more complex cases (12). One privately published economic model even predicted that one DHAT could raise a general dental practice's annual net income by 52% (11).

In Maine, some of the biggest proponents for starting a DHAT program are mid-level dental care providers and legislators. Cathy Kasprak, an independent dental hygienist and president of the Maine Dental Hygiene Association, supports a statewide DHAT program. She knows, first hand, how difficult it is for people to see a dentist if they aren't in close proximity to a dental practice. At her office, she performs cleanings and basic dental procedures, and estimates that over half of her 1,000 patients haven't seen a dentist in 5-10 years. Her location reaches patients who might not be able to afford to travel to a standard dental office (1). She believes that the DHAT program would be a "win" for everyone as DHATs would be able to increase dental care services in rural regions and dentists would be able to increase their patient flow as they would receive more referrals from the DHATs for complex cases. She also claims that opposition to the program from dentists is motivated by money. She believes that dentists are worried DHATs will be taking business away from them (5) . However, in many cases, "stealing" clients isn't an issue as most people in rural areas aren't seeing a dentist on a regular basis anyway. Representative Carol McElwee of Caribou, Maine, supports licensing DHATs and says "we are desperate for dentists here in

Aroostook county" (1). Maine is currently voting on whether or not to allow dental therapists to practice in the state. If approved, the program would be modeled more closely after Minnesota's, but would require a dentist to approve all treatment plans before a therapist is allowed to implement them. On February 28th, the Maine House of Representatives approved creating a "mid-level dental therapist" 102 to 39. However, regardless of opinion, the bill still must pass another vote in the House and two votes in the Maine Senate in order for it to become a law (19).

Discussion

There seems to be no general consensus between Maine residents on whether or not Maine should begin a DHAT program. This can most probably be attributed to the heterogeneity between published studies. One example is the cost effectiveness of DHATs in terms of providing affordable, quality care. A 2013 review by Richards

found no increase in cost effectiveness, but a significant increase in productivity in places that have DHATs. Galloway et al. found this same increase in productivity in their 2002 meta analysis review, but also showed an increase in cost effectiveness. Galloway et al. attributed the increases in both productivity and cost effectiveness in part to the less stringent training requirements and loan accruement of DHATs in comparison to dentists (DHATs make a fraction of what

dentists make in salary). By delegating high demand yet more basic procedures to DHATs, these services can be done at a lower cost and higher frequency (and thus increase productivity), leaving dentists more time to treat patients with more complex and costly procedures. While this seems to be a valid argument in terms cost effectiveness, Richards cautioned taking this study at full face value, as much of the literature from Galloway's review was based around the 1990s and the studies were too heterogeneous to offer reliable insight (20).

Another meta analysis review, conducted by the ADA, was done on the cost effectiveness and decreased caries incidences with DHATs in Australia, Canada, New Zealand and the U.S. in 2013. The review looked at 18 observational studies and found that 67% of the studies were high biased, 28% medium bias, 5% low bias. Biases were linked to different levels of fluoridation between countries and communities, time frames of the study, population diseases and demographic differences among countries (21). These biases make it difficult to project how a widespread acceptance of a DHAT program in the U.S. would fare, especially when its models have been based from programs overseas and the study was conducted by an organization that, in general, opposes the entrance of DHATs into the work force.

Conclusive results for DHAT programs in the U.S. are also difficult as the programs are relatively new. Alaska's program has been running only since 2003, while Minnesota's program began in 2009. It took New Zealand about 50 years to show highly significant results for their program. In the U.S., there also seems to

be a general lack of knowledge about the role, purpose, and training of DHATs. In order to be more confident about data surrounding these programs in the U.S. more studies need to be performed and more time is needed in order to see the true effects. Many states, however, can't afford to wait years to see the long-term effects of Alaska's program. That's why Maine, along with Connecticut, Kansas, Missouri, New Hampshire, New Mexico, North Dakota, Ohio, Vermont and Washington are voting on legislation this year (15).

While there are a myriad of differing conclusions amongst studies, the majority of them has shown that DHATs provide quality care within their scope of practice and increase productivity. Proponents have argued that DHATs will be to dentists what physician's assistants (PA) are to doctors. PAs have led to increased productivity in doctor's offices, and similar to DHATs, were faced with much opposition when introduced into the work force. Now, they are widely accepted and an integral part of the medical field. In conclusion, more studies need to be conducted to assess to efficacy of DHATs, but because of Maine's lack of access to oral care, DHATs are a viable solution to try to bridge that gap.

If the Maine Legislature does not pass the bill this year, several other solutions should be looked at to try to improve the state's access of oral health care. The state should work with University of New England School of Dentistry to try to encourage graduates to practice in rural locations. An increased number of dentists could possibly be achieved by trying to integrate rural dental care as part of the student's curriculum and externship requirements and by offering loan

repayment. Loan repayment could either be in conjunction with the National Health Service Corps or with a new state-based program, and be distributed to graduates who choose to work in Maine's rural communities. The other option is to work with existing dentists in the state. MaineCare reimbursement rates should be increased to encourage dentists to take on more MaineCare patients, tax credits should be given to those who work in rural communities, and mile reimbursements should be given to dentists who frequently travel to provide care to communities who don't have easy access to a dentist. Whatever Maine's solution is, the state needs to start implementing changes now so the gap between those that have access to care and those who don't, doesn't broaden.

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