Potential utilization of expanded function dental auxiliaries to place restoratives

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Abstract
Objectives: The Affordable Care Act is predicted to increase dental benefits coverage for millions of Americans. Utilization of expanded function dental auxiliaries (EFDAs) can contribute to increased workforce capacity. Iowa currently allows EFDAs to perform certain nonrestorative procedures. This study investigated dentists’ willingness to use auxiliaries for restorative procedures in order inform recent discussions about expanding scope of practice for EFDAs to include such procedures.

Methods: This study examined responses from 677 primary care dentists who responded to the 2013 Survey of Iowa Dentists (response rate = 59 percent). The authors performed univariate and bivariate analyses (χ² and t-tests) to examine characteristics of dentists who indicated willingness to utilize an auxiliary for newly proposed restorative functions.

Results: Thirty-seven percent of respondents indicated they would delegate at least one of the newly proposed restorative functions to an auxiliary. Pediatric dentists were significantly more likely to be willing to delegate (P = 0.042). Placing stainless steel crowns was most acceptable (31.9 percent of respondents), followed by amalgam restorations (22.3 percent), and composites (18.6 percent).

Conclusions: Many dentists are willing to delegate reversible restorative procedures. Increasing scope of practice for auxiliaries may increase capacity of the existing dental workforce and improve access for newly insured populations. Expanding scope of practice for dental auxiliaries offers a viable mechanism to rapidly increase states’ dental capacity in response to rising demands for dental care, including newly insured Medicaid populations.

Introduction
A recent report by the Institute of Medicine (IOM) found that “millions of Americans lack access to basic oral health care” (1). Two specific groups identified as facing significant access barriers include Medicaid enrollees and low-income individuals lacking dental benefits. The IOM report went on to state that “it will take flexibility and ingenuity among multiple stakeholders” to reduce these barriers (1).

The American Dental Association (ADA) estimates that 8.7 million children and 17.7 million adults will gain dental benefits by 2018 through implementation of the Affordable Care Act (ACA) (2). These gains will be made primarily through dental benefits purchased through state insurance markets places (i.e., health insurance exchanges) and through expansion of state Medicaid programs. Iowa is expanding healthcare coverage for adults with incomes up to 138 percent of the Federal Poverty Level, and this expanded coverage includes fairly comprehensive dental benefits (3). Newly insured populations in Iowa and other states will likely contribute to increased demand for dental services through pent-up need in individuals who previously lacked coverage.

Multiple solutions to improve access have been utilized, including increasing Medicaid reimbursement rates, providing dental services in schools and other community-based settings, and utilizing midlevel dental providers to provide basic care (4). Dental therapists were first utilized in the United States in Alaska where they provide basic dental
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services to patients in remote areas lacking a dentist (5). Minnesota began training dental therapists in 2009 with its first class graduating in 2011 (6). Another provider model, promoted by the ADA, is the Community Dental Health Coordinator (CDHC) (7). CDHCs would provide education, limited clinical services, and coordinate care in order to connect patients to a dentist who can provide them with appropriate care (7).

Many states currently permit dental assistants and hygienists to perform duties beyond their traditional scope of practice. These “expanded functions” can include exposing radiographs, monitoring the administration of nitrous oxide, placing pit and fissure sealants, and placing restoratives (8). State terminology varies, but we will refer to dental assistants and hygienists authorized to perform additional services as expanded function dental auxiliaries (EFDAs). As of 2010, 13 states allow dental auxiliaries to place and finish amalgams and/or composite resin restorations: Arkansas, California, Idaho, Kentucky, Maine, Michigan, Minnesota, Missouri, New York, Oregon, Pennsylvania, Washington, and Wyoming (9).

Expanded functions for dental assistants or hygienists currently permitted by law in Iowa include: fabricating and removing temporary crowns; taking final impressions and occlusal registrations; applying cavity liners and bases; testing pulp vitality; monitoring nitrous oxide; and placing periodontal dressings, gingival retraction, and dry socket medication (10). For the past several years, stakeholders in Iowa have discussed the possibility of legally expanding delegable functions that can be provided by dental auxiliaries. This option has been explored as a means to maximize the efficiency of dental practices and improve access to care. Studies have previously demonstrated that EFDAs can increase practice efficiency by enabling practices to treat more patients while maintaining quality of service (11-17). Additionally, utilization of EFDAs is positively associated with increasing dentist productivity (18).

Currently, the majority of dentists in Iowa (59 percent) report that they delegate currently allowable expanded functions to dental auxiliaries (19). Thus, conditions support the supposition that increasing the supporting role of EFDAs in Iowa could increase productivity of the current dental workforce, thereby improving overall access to oral health care. Based on these considerations, the Iowa Dental Association leadership recommended that the state dental board expand the current scope of practice for EFDAs in an effort to improve the efficiency of the current workforce. The Iowa Dental Board (IDB) responded by convening a task force that explored this issue. Because of questions that arose from this task force, we conducted this study to evaluate the willingness of primary care dentists to utilize EFDAs for proposed additional restorative procedures.

Methods

In 2013, the University of Iowa Public Policy Center (PPC) and College of Dentistry conducted a survey of private practice dentists in the state. The primary purpose of that survey was to assess Medicaid participation and attitudes toward vulnerable populations. We also included survey items asking dentists about their current utilization of EFDAs and their willingness to utilize EFDAs – including dental assistants and/or dental hygienists – for additional restorative procedures. Results describing current use of EFDAs by dentists in Iowa have been described elsewhere (19).

EFDA-related survey content was based on a review of expanded functions currently allowed by individual states (20). The IDB task force identified three restorative procedures, currently not allowed to be performed by dental auxiliaries in Iowa, for consideration. The proposed functions include a) placing and shaping composite restorations, b) placing and shaping amalgam restorations, and c) fitting and cementing stainless steel crowns.

Questions were then developed through an iterative process with input from the IDB task force and members of a national advisory committee, which provided feedback throughout survey development. Pretesting of survey items was conducted by members of the task force and the national advisory committee.

These questions were included in the 2013 Survey of Iowa Dentists, which was administered by The University of Iowa PPC. Dentists were provided a list of the proposed functions and asked if they would consider delegating these to an EFDA.

Mailing addresses and demographic information for all licensed dentists engaged in active practice in Iowa were obtained from the Iowa Dentist Tracking System (21). Surveys were mailed to all active private practitioners in Iowa (n = 1,341); we limited this analysis to general and pediatric dentists only (n = 1,145). Dentists had the option of filling out the mail version of the questionnaire or completing this online. The PPC sent out a reminder postcard approximately 10 days after the original mailing, followed by a second survey packet after 1 month. We excluded other dental specialties because the proposed functions are most relevant to general and pediatric dentists (e.g., placing restorations and fitting stainless steel crowns). This study was approved by the University of Iowa’s Institutional Review Board.

Our overall response rate to the survey was 59.1 percent (n = 677) (Table 1). Descriptive statistics were performed to examine characteristics of survey respondents and the acceptability of additional expanded functions. Dentist characteristics of interest included specialty, gender, age, hours worked per week, and perceived workload. Information about race/ethnicity was not available. Dentist location was categorized using 2013 Rural-Urban Continuum Codes as either metro (RUCC 1–3) or nonmetro (RUCC 4–9) (22). We
also examined current participation in the Iowa Medicaid program based on whether or not dentists accepted new Medicaid patients into their practice and whether at least 10 percent of current patients were enrolled in Medicaid. Bivariate analysis examined relationships between dentist characteristics and acceptability of delegating proposed restorative functions.

Results

Males comprised 76.5 percent of the respondents. Additionally, the majority of respondents (55.6 percent) were 50 years of age or older. Respondents did not differ significantly from nonrespondents based on age or gender (Table 1). However, respondents were significantly more likely to be general dentists than nonrespondents. They were also significantly more likely to be solo practitioners and live in nonmetro counties than nonrespondents.

We evaluated dentists’ willingness to delegate the three newly proposed restorative procedures (e.g., placing and shaping amalgam and composite resin restorations, and fitting and cementation of stainless steel crowns). Over one-third of dentists (37.0 percent) would consider allowing EFDAs to provide at least one of these three more complex restorative services (Table 2). We found that fitting and cementing stainless steel crowns was the most widely accepted restorative procedure that dentists (31.9 percent) were willing to delegate to EFDAs. Dentists were least likely to consider permitting EFDAs to place and shape composite restorations (18.6 percent). This supports our previously published findings that dentists consider the complexity of a task before delegating it to an EFDA (19).

Bivariate analyses was performed to determine the characteristics of dentists that would influence whether they would utilize EFDAs with restorative capabilities (Table 3). We found that

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Characteristics of Primary Care Dentists Who Responded to the 2013 Survey of Iowa Dentists (n = 677)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey respondents (n = 677)</td>
<td>Nonrespondents (n = 469)</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>518 (76.5%)</td>
</tr>
<tr>
<td>Female</td>
<td>159 (23.5%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>&lt;30 years</td>
<td>39 (5.8%)</td>
</tr>
<tr>
<td>30-39</td>
<td>134 (19.8%)</td>
</tr>
<tr>
<td>40-49</td>
<td>127 (18.8%)</td>
</tr>
<tr>
<td>50-59</td>
<td>199 (29.4%)</td>
</tr>
<tr>
<td>60-69</td>
<td>154 (22.8%)</td>
</tr>
<tr>
<td>≥70</td>
<td>23 (3.4%)</td>
</tr>
<tr>
<td>Specialty</td>
<td></td>
</tr>
<tr>
<td>General dentistry</td>
<td>657 (97.0%)</td>
</tr>
<tr>
<td>Pediatric dentistry</td>
<td>20 (3.0%)</td>
</tr>
<tr>
<td>Practice arrangement</td>
<td></td>
</tr>
<tr>
<td>Solo</td>
<td>334 (49.3%)</td>
</tr>
<tr>
<td>Other</td>
<td>343 (50.7%)</td>
</tr>
<tr>
<td>County urbanicity</td>
<td></td>
</tr>
<tr>
<td>Metro</td>
<td>390 (57.6%)</td>
</tr>
<tr>
<td>Nonmetro</td>
<td>287 (42.4%)</td>
</tr>
</tbody>
</table>

* Significant at P < 0.05.

Note: Percentages may not total 100% due to rounding.

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Dentist Acceptability of Proposed Restorative Procedures for EFDAs (n = 677)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Would you delegate at least one of the proposed restorative duties?</td>
<td>242 (37.0%)</td>
</tr>
<tr>
<td>If the practice act was changed, would you consider using an EFDA to provide any of these duties?</td>
<td>Yes</td>
</tr>
<tr>
<td>Fit and cement stainless steel crowns on primary teeth</td>
<td>209 (31.9%)</td>
</tr>
<tr>
<td>Place and shape amalgam restorations following preparation of a tooth by a dentist</td>
<td>145 (22.3%)</td>
</tr>
<tr>
<td>Place and shape composite restorations following preparation of a tooth by a dentist</td>
<td>122 (18.6%)</td>
</tr>
</tbody>
</table>
68 percent of pediatric dentists indicated they would be willing to delegate at least one of the proposed restorative procedures compared with 36 percent of general dentists \((P = 0.004)\).

**Discussion**

Use of dental auxiliaries to place restoratives has been permitted in several states since the 1960s (23). Studies have demonstrated that EFDAs permitted to perform restorative functions may be able to improve access to care and practice productivity (14-18,23). Amalgam and composite resin restorations placed by EFDAs are of similar quality as those placed by dentists (11-13,16,23). Despite this evidence of quality and potential for increased productivity, use of EFDAs remains low even where allowed by law (24). A recent survey of practitioners in the National Dental Practice-Based Research Network found that 15 percent of dentists had experience working with an expanded function auxiliary. However, the majority of surveyed dentists (54 percent) agreed that EFDAs have a positive impact on the overall quality of care (24).

Although the technical competency of EFDAs and their potential to contribute to practice efficiency are documented, there is little evidence about the willingness of dentists to delegate specific restorative functions. Our study aimed to provide insight on this issue, which is particularly important considering the current discussions being held nationally about workforce challenges related to an aging dentist population and implementation of the ACA.

Our previous work has demonstrated that approximately 59 percent of primary care dentists in Iowa currently delegate allowable procedures to EFDAs (19). This compares well with a recent study of Colorado dental practices, which found that...
64 percent reported currently using expanded function staff (14). Findings from the survey of dentists in the National Dental Practice-Based Research Network found low rates for delegation of restorative procedures; only 6 percent of dentists delegated these to dental assistants and fewer than 2 percent of dentists delegated to dental hygienists (24). That study hypothesized that limited experience with auxiliaries and providing team-based care limited dentists from maximizing their use of EFDA.

Our study did not find an association between willingness to delegate proposed restorative functions and whether a dentist practiced in a solo or group setting (Table 3). However, previous studies have found that group practices are more likely to delegate to EFDA at higher rates (17,24). Future research should explore why this is the case.

Within social psychology, intentions are the most effective predictors of behavior when based on direct experience and personal motivation (25). In this survey, we asked dentists to predict how likely they would be to delegate restorative functions to an auxiliary. As task delegation is a familiar behavior that occurs within the typical practice environment, dentists’ self-reported intentions are expected to be reasonable predictors of this behavior. Although intentions and behavior are not always consistent, surveys such as the one used in this study offer a valuable source of information for policy decisions.

EFDA utilization may help address concerns about the anticipated increase in demand for dental services due to the ACA and expanded Medicaid coverage in some states. However, EFDA does not create new points of contact for the dental care system; they can only contribute to increased workforce capacity where services currently exist. Alternative initiatives in other states have also successfully increased provision of dental services for publicly insured populations, including increases to reimbursement rates, streamlining Medicaid administration, and loan repayment programs for dentists that practice in underserved areas (26).

We have previously found that younger dentists and female dentists are more willing to utilize EFDA (19). Those findings corroborate recent findings from the National Dental Practice-Based Research Network (24). Younger dentists’ utilization of EFDA may help compensate for the aging of the nation’s workforce, with over 65 percent of the nation’s dentists being 45 years or older (27). Additionally, the increasing number of female dentists increases the likelihood that EFDA would be utilized in existing and future practices (28). The tendency for younger and women dentists to utilize EFDA indicates that EFDA with restorative capacities could help address the increasing need for more patients to receive oral health care currently and in the future.

We found over one-third of general dentists in private practice would utilize EFDA to delegate the proposed restorative functions. Our survey did not examine whether this willingness to delegate varied depending on whether a hygienist or a dental assistant would be performing the function. Pediatric dentists were even more likely to utilize restorative function EFDA; 68 percent of pediatric dentists reported that they were willing to delegate a proposed restorative function (Table 3). Utilization rates for pediatric dental services, especially among low-income children, have been steadily increasing—a trend that is predicted to continue (6). A large proportion of pediatric dentists in Iowa accept Medicaid patients; a previous study has found that pediatric dentists are willing to use EFDA to place restoratives (29). That study also found that 37 percent of pediatric dentists in Iowa would be willing to see more Medicaid patients if they could employ an EFDA who could perform restorative functions.

The EFDA task force appointed by the IDB has used findings from this current study to help make recommendations about increasing currently allowed functions that dental auxiliaries may perform. It is unknown whether our findings are generalizable for dentists in other states. Compared with other proposed solutions for increasing the capacity of the dental workforce, utilizing EFDA offers several advantages. Creating new dental schools is a timely and expensive task. In contrast, continuing education courses to train already practicing auxiliaries to perform reversible restorative procedures could be established in less time and with less cost by using currently established dental training centers and curriculum models. Because EFDA require dentists’ supervision, the EFDA model allows dentists more autonomy in regulating what they allow auxiliaries to perform in their practices and only allows EFDA to provide reversible services. Changing state scope of practice laws to enable EFDA to place restoratives would be a rapid and efficient way to increase workforce capacity to fulfill demand for dental care related to implementation of the ACA and potentially alleviate access issues for Medicaid enrollees.

Acknowledgments

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