



# Dentists' levels of evidence-based clinical knowledge and attitudes about using pit-and-fissure sealants

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**C**aries is the most common childhood disease and occurs disproportionately among different subgroups of children in the United States.<sup>1</sup> Data from the 2009-2010 National Health and Nutrition Examination Survey indicated that at least 14 percent of children in the United States aged 3 through 9 years had untreated caries.<sup>2</sup> Untreated caries can lead to substantial morbidity and, in some extreme cases, to death. Therefore, without the use of early and effective preventive measures to inhibit the initiation and development of caries in children, improving their oral health will be difficult to achieve.

Approximately 90 percent of carious lesions occur in pits and fissures of the posterior teeth.<sup>3</sup> This high prevalence of caries is the main rationale for advocating the use of dental sealants to prevent caries on these surfaces. Dental sealants prevent caries when used as a preventive measure for an individual child or in populations at risk of developing caries.<sup>4,5</sup> In 2008, the American Dental Association (ADA) Council on Scientific Affairs published evidence-based clinical recommendations for the use of pit-and-fissure sealants.<sup>6</sup> In the report, the ADA Council on Scientific Affairs provided multiple evidence-based recommendations or criteria for the appropriate use of dental sealants by dental professionals.

Despite evidence of sealants' effectiveness in preventing caries, the prevalence of dental sealants placed in children in the United States is low. The Healthy People 2010 oral health objective of at least 50 percent of children aged 8 through 14 years having a sealant on one or more molars was not met.<sup>7</sup> In 2010, only one-third of 8-year-old children in the United States and 14.1 percent of 14-year-olds had a dental sealant

## ABSTRACT

**Background.** Although the prevalence of pit-and-fissure sealants in children in the United States is low, the problem is magnified in low-income children. A small proportion of Florida's low-income children receive any preventive dental services, including sealants. The authors conducted a cross-sectional study to assess whether Florida's dentists provide sealants as a preventive measure in their practices, their attitudes and their levels of evidence-based clinical knowledge about appropriate sealant use according to the American Dental Association (ADA) recommendations.

The authors also assessed whether the number of years since graduation and reliance on peers or colleagues for regular clinical information were associated with dentists' knowledge.

**Methods.** The authors administered a 25-item pretested questionnaire to a convenience sample of general and pediatric dentists ( $n = 163$ ) at the 2013 Florida National Dental Convention in Kissimmee, Fla. The authors conducted multivariate linear regression modeling to predict dentists' levels of evidence-based clinical knowledge.

**Results.** Years since graduation ( $P = .2$ ) and reliance on peers or colleagues for regular clinical information ( $P = .6$ ) did not predict higher knowledge. Male dentists ( $P = .003$ ) and those who accepted children enrolled in Medicaid as new patients ( $P = .01$ ) had significantly more knowledge compared with their counterparts.

**Conclusions.** Most participating dentists used sealants in their practices and had high levels of positive attitudes about using sealants. Overall knowledge regarding the appropriate use of sealants, however, was low.

**Practical Implications.** For practicing dental professionals, the authors recommend disseminating evidence-based recommendations for the use of dental sealants via continuing education courses and other possible modalities. They also recommend that dental schools update their existing courses or modules about sealants by integrating the ADA's recommendations.

**Key Words.** Dental sealants; dentists; attitudes; evidence-based knowledge; preventive dentistry.

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in one or more molars.<sup>7</sup> The results of previous studies showed that different factors were involved in predicting low sealant adoption rates among dental professionals in their clinical practices.<sup>8-23</sup> These factors included a lack of certainty about the effectiveness of the sealant, concerns about accurate tooth selection, fear of sealing in caries, poor retention rates, difficulty managing the treatment of young children, limited insurance coverage or parents' unwillingness to pay for sealant placement and frequent need for maintenance or replacement.<sup>8-23</sup>

In a 2013 report by The Pew Center, the state of Florida received a grade of D on the basis of its children's limited access to dental sealants.<sup>24</sup> The authors of the report showed that Florida lagged substantially behind many other states in improving children's and adolescents' access to sealants, especially those from low-income families. Data from the Centers for Medicare and Medicaid Services indicate that for fiscal year 2008, only 14 percent of children in Florida who were enrolled in Medicaid received any preventive dental services, including dental sealants, and that this percentage was less than one-half of the national average of 34 percent.<sup>25</sup>

All of these findings suggest that a substantial proportion of low-income children in Florida may not be receiving dental sealants and that many may have impending oral health needs. There may be many reasons for the low levels of sealant use in children enrolled in Medicaid, of which the slow incorporation of dental sealants by dentists in Florida as a routine preventive measure in their clinical practices is one.

We conducted a study to determine whether dentists in Florida used sealants as a routine preventive measure in their clinical practices. Because the adoption of sealant use in clinical practice cannot be successful until dentists have positive attitudes about placing sealants and have thorough evidence-based clinical knowledge about the appropriate selection of patients and the use of dental sealants, we assessed general and pediatric dentists' attitudes and levels of evidence-based clinical knowledge. Investigators in a 2013 qualitative study assessed dentists' behaviors about implementing the dental sealant use clinical recommendations.<sup>13</sup> They found that dentists relied on their peers or colleagues as a regular source of learning about clinical information and that the number of years since the dentists graduated was correlated highly with the adoption of certain treatment options. Therefore, we tested two hypotheses. First, we assessed whether dentists who rely regularly on peers or colleagues for clinical information have different levels of evidence-based clinical knowledge regarding the use of dental sealants than do those who do not rely on peers or colleagues. Second, we examined whether the length of time since graduation was associated with the dentists' levels of evidence-based clinical knowledge about the use of dental sealants.

## METHODS

The institutional review board at Nova Southeastern University, Fort Lauderdale, Fla., approved our study. For this cross-sectional study, general and pediatric dentists ( $n = 163$ ) who were attending the 2013 Florida National Dental Convention, in Kissimmee, Fla., volunteered to complete a 25-item, self-administered, pretested questionnaire. We modified and adapted the questionnaire from a previously tested survey that was used to assess sealant use among New York state dentists (unpublished data). We obtained permission to adapt and modify the instrument for our study (Jayanth Kumar, DDS, MPH, director, Dental Bureau, New York State Department of Health, written communication, Oct. 17, 2012). The questionnaire included both open- and closed-ended questions (that is, either yes/no or check-box-type questions).

The data we collected included, but were not limited to, sex, race, type of dentist (that is, general dentist or pediatric dentist), number of years since graduating from a predoctoral dental program, predoctoral dental education obtained from a university in the United States (yes/no), dental sealant education received in a predoctoral curriculum (yes/no), current Medicaid patient enrollment status (yes/no) and the acceptance of children enrolled in Medicaid as new patients (yes/no). To assess dentists' attitudes about using dental sealants, we asked them to choose or agree with one or more statements describing their concerns about using dental sealants as a routine preventive measure. The nine attitude statements included whether the costs of the sealants outweigh the benefits, the difficulty gaining access to molars, how technique-sensitive the procedure is, the need for frequent replacement and maintenance of the sealants, the inferior performance of the sealants compared with other restorative materials, the difficulty of caring for young children, the possibility of sealing in caries, the unclear practice guidelines and lack of research-based evidence on sealants' effectiveness.

We asked participants three knowledge-based questions derived from the ADA's evidence-based clinical recommendations<sup>6</sup> regarding the appropriate selection of patients and the use of dental sealants. The questions were aimed at determining the primary method they used to detect noncavitated carious lesions (correct answer: visual examination after cleaning and drying the tooth), their first choice of dental material for dental sealants (correct answer: resin based) and the procedure they would adopt to treat incipient or noncavitated carious lesions (correct answer: application of sealants without mechanical preparation of the enamel). We also asked participants to identify the resources on which they usually rely to keep themselves up to date on clinical information, with possible answers including a check-

**ABBREVIATION KEY.** ADA: American Dental Association.

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