

Expanded Scope of Practice for Dental Hygienists Associated with Favorable Children's Oral Health

Jean Moore, FAAN, DrPH, Margaret Langelier, MSHSA, Simona Surdu, MD, PhD, Tracy Continelli, PhD, and Kristen Stiegler, MPA
Oral Health Workforce Research Center, Center for Health Workforce Studies, University at Albany

ABSTRACT

Objectives: The objective of this study was to estimate if variation in state-level scope of practice for dental hygienists was associated with children's oral health outcomes.

Methods: This study used the Dental Hygiene Professional Practice Index (DHPPI) to measure the state-level scope of practice for dental hygienists. Demographic characteristics and oral health status of children were extracted from the National Survey of Children's Health. Several data sources were used to describe the supply of dental practitioners and other state-level sociodemographic and geographic characteristics. Multilevel logistic modeling was employed to assess the association between state specific scopes of practice for dental hygienists and oral health outcomes in the population of children in each state.

Results: The expanded scope of practice for dental hygienists was associated with the favorable outcome of having excellent or very good teeth in children with preventive dental visits compared to children who did not receive preventive services within the past year. A 10-point increase in a composite DHPPI score was associated with a relative increase of 3.6% ($P=.039$) in the likelihood of having excellent or very good teeth in children with recent preventive dental visits compared to other children. Much stronger associations were observed in the separate analyses of the regulation (53.2%, $P=.015$) and supervision components of the DHPPI scores (7.1%, $P=.020$).

Conclusions: The study findings indicated that a more expansive dental hygiene scope of practice was positively and significantly associated with favorable children's oral health among those with recent dental office visits.

CONTACT

Oral Health Workforce Research Center
Center for Health Workforce Studies
518-402-0250
info@oralhealthworkforce.org
www.oralhealthworkforce.org



SCAN ME

This work is supported by the Health Resources and Services Administration (HRSA) of the US Department of Health and Human Services (HHS) as part of an award totaling \$448,203. The contents are those of the authors and do not necessarily represent the official views of, nor an endorsement, by HRSA, HHS, or the US Government. For more information, please visit HRSA.gov.

BACKGROUND

- Over the past decade, there have been concerted efforts to address children's unmet oral health needs by increasing the use of community based oral health services
- Dental hygienists, as oral health preventive specialists, are the dental professionals most often providing services in these community based programs
- The ability of a dental hygienist to work in these settings depends on state-based occupational regulation governing the profession
- The purpose of this study was to examine whether dental hygienists' scopes of practice are significantly associated with the oral health status of US children

METHODS

Data Sources:

- National Survey of Children's Health Data (NSCH)**
 - The 2011-2012 NSCH is a survey sponsored by the Maternal and Child Health Bureau of HRSA that gathers information about children's health and well-being (n=95,677 children in the US)
 - Individual level data on children's demographics and socioeconomic characteristics
 - Oral health information such as children seeing a dentist in the past year and condition of children's teeth
- Dental Hygiene Professional Practice Index (DHPPI)**
 - A metric created by the OHWRC in 2001 and updated in 2014 to quantify variation in the state-level scope of practice (regulation, supervision, permitted tasks, reimbursement) for dental hygienists
 - The highest possible composite score was 100 that indicates optimal conditions for a dental hygienist to provide services in community settings appropriate to professional competencies and training
- Other State-Level Data**
 - American Community Survey (ACS), 2009-2013: Computed rates of dental hygienists and dentists per 100,000 population
 - Centers for Disease Control's (CDC) Water Fluoridation System, 2012: Estimated % of population on a fluoridated public water supply

Data Analysis:

- Outcome Measure**
 - The binary outcome variable measured the condition of children's teeth as excellent or very good as opposed to good, fair, or poor
- Predictor Factor Measures**
 - State-level composite DHPPI score & each of the component scores
- Confounding and Moderator Effect Measures**
 - Individual-level sociodemographic and state-level characteristics
 - Children's dental visits for preventive services in the past year
- Statistical Analyses**
 - Multilevel logistic models were run to assess the association between the state-level DHPPI scores and the oral health status of children moderated by preventive dental visits within the past year, adjusting for the relevant confounding factors
 - All analyses were conducted using SAS v9.4

RESULTS

- Nationwide, 64% of children had preventive dental visits within the past year and 71% reported teeth in excellent or very good condition

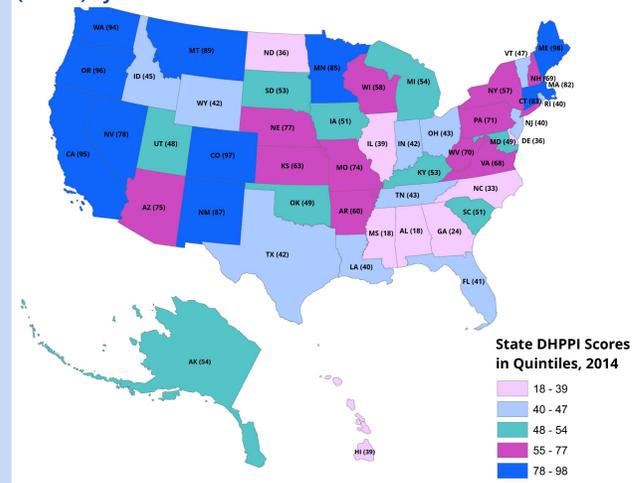
Table 1. Children's Characteristics

Children's Sociodemographic and Oral Health Characteristics	Weighted %	Unweighted Total n
Preventive Dental Visits in the Past 12 Months	64%	82,596
Condition of Teeth (excellent or very good)	71%	90,483
Race/Ethnicity (White or Asian, non-Hispanic)	55%	93,571
Age Groups		
Ages 0 to 6	38%	95,677
Ages 7 to 12	33%	95,677
Ages 13 to 17	28%	95,677
Sex (female vs male)	51%	95,568
Parental Marital Status (married)	59%	94,512
Parental Health Insurance Status (none)	6%	94,558

Source: NSCH, 2011-2012.

- In 2014, DHPPI composite scores ranged from a low of 18 in Alabama and Mississippi to a high of 98 in Maine on a possible score of 100

Figure 1. Composite Scope of Practice Index for Dental Hygienists (DHPPI) by State in 2014



Sources: OHWRC, 2016.

- Mean composite score across states was 57.6 (range=18-98)
- Nationwide, mean score for supervision was 27.3, ranging from a low of 6 in Mississippi to a high of 47 in Colorado and Maine

Table 1. State-Level Characteristics

State-Level Characteristics	Mean	Min.	Max.
Dental Hygiene Scope of Practice Index (DHPPI)			
Composite Score (ideal score=100)	57.6	18	98
Regulation Score (ideal score=10)	7.8	6	10
Supervision Score (ideal score=47)	27.3	6	47
Tasks Score (ideal score=28)	18	0	26
Reimbursement Score (ideal score=15)	4.4	0	15
No. of oral health providers per 100,000 population			
Dental Hygienist Rate	50	27.2	108.4
Dentist Rate	52	32.6	120.7
Percent of Population with Fluoridated Water	74.6%	99.9%	100.0%

Sources: OHWRC, 2016; ACS, 2009-2013; CDC, 2012.

RESULTS (cont.)

- A 10-point increase in a DHPPI composite score was associated with a relative increase of 3.6% in the likelihood of having excellent or very good teeth in children with recent preventive dental visits compared to other children
- Several variables exerted a strong positive individual-level effect on the condition of children's teeth
- Both the dental hygienist rate and the dentist rate were positively and significantly associated with favorable oral health outcomes

Table 3. Association Between Scope of Practice for Dental Hygienists (DHPPI Composite Score) and the Condition of Children's Teeth Moderated by Preventive Dental Visits Within the Past Year

Variables	OR	p
State-Level		
Intercept	0.5465	<0.001
DHPPI Composite Score	0.9936	<0.001
Dental Hygienist Rate	1.0045	<0.001
Dentist Rate	1.0045	<0.001
Percent of population with fluoridated water	1.0016	0.091
Individual Level		
Parental Health Insurance Status (ref: no insurance)	1.8860	<0.001
Parental Marital Status (ref: unmarried)	1.5291	<0.001
White or Asian, non-Hispanic (ref: other race/ethnicity)	2.2281	<0.001
0 to 6 Years of Age (ref: 7 to 12)	2.0095	<0.001
13 to 17 Years of Age (ref: 7 to 12)	1.2120	<0.001
Female (ref: male)	1.2059	<0.001
Preventive Dental Visits (ref: none in the past year)	1.1017	0.376
DHPPI Composite Score * Preventive Dental Visits	1.0036	0.039

Source: OHWRC, 2016.

- Much stronger associations were observed in separate analyses of DHPPI scores
- A 10-point increase in the DHPPI regulation and supervision score was associated with a relative increase of 53.2% and 7.1% in the likelihood of having excellent or very good teeth in children with recent preventive dental visits than other children

Table 4. Association Between Scope of Practice for Dental Hygienists (DHPPI Regulation, Supervision, Tasks, and Reimbursement Scores) and the Condition of Children's Teeth Moderated by Preventive Dental Visits Within the Past Year

Moderation Effect of DHPPI Scores	OR	p
Regulation Score	1.0532	0.015
Supervision Score	1.0071	0.020
Tasks Score	1.0134	0.051
Reimbursement Score	1.0085	0.100

Source: OHWRC, 2016.

CONCLUSIONS

- A more expansive dental hygiene scope of practice (represented by the state-level DHPPI score) was positively and significantly associated with favorable children's oral health among those with recent dental office visits
- Supply of both dentists and dental hygienists was positively and significantly associated with improved oral health outcomes in children

REFERENCES

- Langelier M, Baker B, Continelli T, Moore J. *A Dental Hygiene Professional Practice Index by State, 2014*. Rensselaer, NY: Oral Health Workforce Research Center, Center for Health Workforce Studies, School of Public Health, SUNY Albany; March 2016.
- Langelier M, Continelli T, Moore J, Baker B, Surdu S. Expanded Scopes of Practice for Dental Hygienists Associated With Improved Oral Health Outcomes for Adults. *Health Affairs*. 2016;35(12):2207-2215.