Attitudes of Dental Hygienists towards Independent Practice and Professional Autonomy

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Abstract

Purpose: The purpose of this cross-sectional, quantitative research was to examine if registered dental hygienists feel competent to work independently based on regulations of dental supervision.

Methods: A stratified sample of 360 dental hygienists from 8 states completed the Dempster Practice Behaviors Scale survey. ANOVA and MANOVA analyses revealed how state dentist supervision level, age, degree of education, employment status, gender and years of clinical experience affect the perceived autonomy of professional dental hygienists.

Results: The response rate included 360 dental hygienists from 8 states. According to the findings age, education level and gender affected the hygienist's level of autonomy. In all 8 states, the registered dental hygienists have a high level of autonomy and feel competent to work independently.

Conclusion: The DPBS scores of the sample registered dental hygienists suggest that they feel prepared and competent to perform preventive dental hygiene services without dentist supervision. The attitudes of the dental hygienist sample from each of the 4 state dentist supervision levels supports a move toward achieving professional jurisdiction of preventive dental care within the U.S.

Keywords: dental hygiene, supervision level, access to dental care, autonomy, independent practice

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Introduction

Access to dental care is a challenge across the U.S., which has been attributed to a shortage of trained providers, a lack of funding for dental care, inadequate coverage by health plans, and an aging workforce of dentists.[1] A key component of the Patient Protection and Affordable Care Act (PPACA) is to alleviate the shortage of dental services in the U.S.[2] As of November 2012, there were 195,941 professionally active dentists in the U.S. with a projected growth rate of 21% annually.[3] In 2012, there were 195,903 professionally active dental hygienists in the U.S., with a projected growth rate of 38% annually.[4,5] The total number of dental graduates in 2012 was 5,199, whereas the total number of dental hygiene graduates in 2012 was 7,103.[4] If these trends continue, the annual increase of dentists is projected to insufficiently meet the increase of population need for dental providers in the U.S. each year.[6]

The high cost of dental care, lack of dental insurance, and misdistribution of dental providers prevent many Americans from obtaining dental care.[7] From 2010 to 2011, 13.2% of Americans who were interviewed stated that they did not obtain dental care during the previous 12 months due to the high cost.[7] In addition, as of 2013, there were 4,595 dental care Health Professional Shortage Areas (HPSAs) in the U.S. where there were an insufficient number of providers to meet the needs of the population.[6] Across these shortage areas, only 42% of the population need was met.[6] The number of additional dentists and dental hygienists required to meet 100% of the population need is 6,531.[6]

Dental hygienists are licensed preventive dental professionals who could help reduce the current burden of need if they were permitted to work without dental supervision in all 50 states.[6] Currently, licensure requirements call for all U.S. dental hygienists to graduate from an accredited dental hygiene program and complete a written national examination in addition to a regional or state clinical examination.[8] In 8 states a dental hygienist is legally required to be directly supervised (on the premises) by a dentist while providing preventive dental services.[9] In other states that have some level of general supervision, the dentist is legally required to authorize preventive services provided by a dental hygienist prior to implementation.[9] Therefore, an individual must be examined by a dentist prior to being treated by a dental hygienist for preventive services in general supervision states.

As a comparison, The Report on the Future of Nursing recommends removing scope-of-practice barriers in health care to facilitate the ability of registered providers to work to the full extent of their education and training.[10] This report has increased attention to scope-of-practice and state supervision regulations in nursing.[10] Investigators have shown that using health care mid-level providers such as nurse practitioners, to execute services that they are licensed to deliver is cost-effective and accepted by patients.[11] It is estimated that the average cost of a physician assistant or nurse practitioner visit is 20 to 35% lower than a physician visit.[12] In a study by Dierick-van Daele et al, patients seeing nurse practitioners were more satisfied and felt that the quality of care was equivalent to physician care.[11]

Professionals such as nurse practitioners are allowed greater autonomy to make decisions about the care of their patients. Autonomy is defined as self-governing; a social environment where others are considered as separate individuals capable of self-determination.[13] Gender and class background have been a significant factor in the autonomy and self-regulation of professions.[14] In the early periods of professions, women were excluded from entrance into professions which established a male domination. Whittington found that gender still plays a statistically significant factor in science-based professions.[15]

It is unclear if dental hygienists, who are predominately female,[16] feel capable of autonomy in the care of patients and if their education has prepared them to take on this role. The purpose of this study was to determine if dental hygienists from different states view their education and capabilities as adequate to provide preventive dental care independently to individuals in need and underserved areas.

Methods and Materials

The study used a cross-sectional, quantitative survey design. A stratified sample, based on state dental supervision levels for dental hygienists and gender, was drawn from state dental boards or dental hygiene boards that would allow access to the e-mail or mailing addresses of dental hygienists. The sample was obtained from state boards with various dental hygiene supervision levels. The sample of registered dental hygienists was randomly selected from 8 preselected sample states based on dental supervision levels of dental hygienists and ability to obtain e-mail and traditional mailing addresses. The states that were utilized in the study included: Alabama, California, Colorado, Florida, North Carolina, Tennessee, Washington, and West Virginia. The states were divided into 4 categories of state regulated dental supervision: direct access with local anesthesia allowed, general supervision/direct access with local anesthesia allowed, general supervision with local anesthesia allowed, and direct supervision/general supervision with no local anesthesia allowed. In order to ensure an acceptable number of male dental hygienists in the study sample, all male dental hygienists within 6 of the states were solicited since there were fewer than 100 male dental hygienists within these states. Table I displays the number of available participants by each state used in the study.

The study used a confidence level of 90%, a 0.5 standard deviation, and a confidence interval of +/- 5% in order for the results to be considered statistically significant. Using a MANOVA sample analysis table, the sample size needed for this study was 130 participants for a medium effect and an alpha level of 0.05 for 8 groups with 6 variables.[17] Therefore, surveys were sent to 1,250 registered dental hygienists in order to obtain the 130 respondents for a precision level sample size of 8 dental hygiene groups.[18]

Two tools were used to collect data for this study. The first was the Dempster Practice Behaviors Scale (DPBS) instrument utilizing scale rated questions.[19] The survey questionnaire was designed by the principal investigator, Judith S. Dempster, in 1990 for her dissertation. The questionnaire was tested for reliability and validity prior to its use in other studies.[19] The second instrument gathered demographic data including a nominal scale of age, gender, educational background, highest dental hygiene degree level obtained, clinical employment status, teaching status, graduation year from a dental hygiene program, and state of current residence.

The study participants were recruited in June and July of 2014. Implied consent was used, that is, completing the questionnaire implied that participants were willing to participate in the study. Over a 1-month period, 650 surveys were mailed through the United States Postal Service. In addition, 600 survey links were e-mailed to dental hygiene potential participants through Survey Monkey. Candidates in Alabama, California, Colorado, and North Carolina were mailed surveys through the postal service along with a self-addressed stamped return envelope. Candidates in Florida, Tennessee, Washington, and West Virginia were sent an e-mail invitation to complete the survey online through Survey Monkey. In addition, 100 randomly selected female dental hygienists and 100 randomly selected male dental hygienists, all with an active license from each of the 8 states, were sent surveys. Due to an insufficient number

Table I: Number of Available Study Participants by State

	Active Female Dental Hygienists	Active Female Dental Hygienists (Percent)	Active Male Dental Hygienists	Active Male Dental Hygienists (Percent)	Total Active Dental Hygienists
Alabama	4,077	99	25	1	4,102
California	27,740	98	618	2	28,358
Colorado	4,479	99	63	1	4,542
Florida	13,011	98	227	2	13,238
North Carolina	5,587	99	73	1	5,660
Tennessee	3,231	99	23	1	3,254
Washington	5,179	99	67	1	5,246
West Virginia	1,090	99.99	9	0.01	1,099
Total	64,394	98.3	1,105	1.7	65,499
U.S.	191,985	98	3,918	2	195,903*

*From "Dental and allied dental graduates 2001-2012" by ADEA, 2013b and "Bureau of Labor Statistics: Occupational outlook handbook for dental hygienists" by USDL, 2013b.

of male dental hygienists within 6 states, only 25 surveys were sent to Alabama male dental hygienists, 63 to Colorado male dental hygienists, 73 to North Carolina male dental hygienists, 23 to Tennessee male dental hygienists, 67 to Washington male dental hygienists, and 9 to West Virginia male dental hygienists.

Results

Of the 1,250 surveys that were sent, a total of 405 surveys (32.4%) were returned. Of the 405 returned surveys, 198 (48.9%) were mailed surveys and 207 (51.1%) were online surveys. Forty-seven online surveys (7.8%) and 22 mailed surveys (3.4%) were returned as undeliverable. Twenty-one online recruits (3.5%) declined survey participation. Total usable surveys numbered 360 (88.9%).

Figures 1 through 5 show the frequency distribution of the study participants based on age, employment status, years of clinical experience, education level, and state of residency. The average age of the participants was 45.41 years. Clinicians numbered 333 (92.5%) and 27 (7.5%) were educators. Twenty-six (7.2%) had a certificate in dental hygiene, 191 (53.1%) had an associate degree in dental hygiene, 113 (31.4%) had a bachelor's degree in dental hygiene, 27 (7.6%) had a master's degree in dental hygiene, and 3 (0.8%) had a doctorate degree.

The ANOVA results in Table II show that there

Figure 1: Frequency Distribution of Study Participant's Age

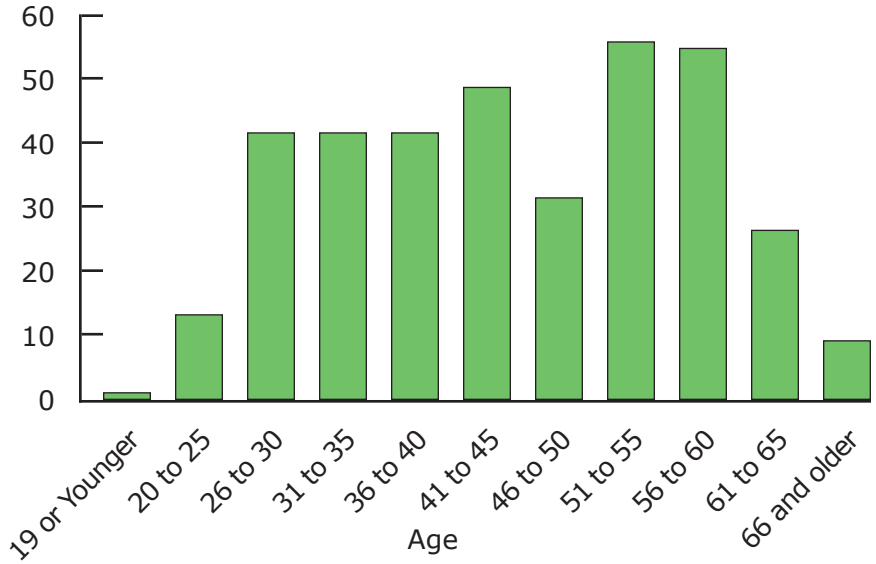
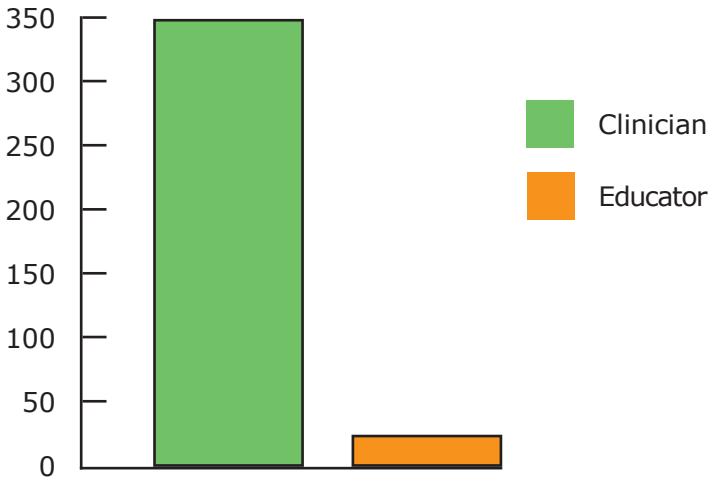


Figure 2: Frequency Distribution of Study Participant's Employment Status



were no significant differences among the DPBS scores when comparing state dental supervision levels, age groups, education level, employment status, gender, or years of clinical experience among dental hygienists. However, the MANOVA results show that there were significant differences among DPBS scores when comparing state dental supervision levels with age, educational level, and gender. These results reiterate that ANOVA post hoc analyses ignore the fact that the MANOVA hypothesis includes sub-hypotheses about linear combinations of dependent or control variables.[20]

Follow-up pairwise comparisons were conducted for the dependent variable, independent variable, and 5 control variables. With the Bonferroni method, each comparison was tested at the alpha level for the ANOVA divided by the number of comparisons.[20] In addition, the same 5 comparisons were performed using the Dunnett's C method since the variances for gender and employment status were not homogenous. For age, educational level, and gender there was a significant difference in DPBS mean scores among the 4 dental supervision levels. There was a non-significant difference in the means between: employment status and years of clinical experience among the 4 dental supervision levels and also means of the 4 dental supervision levels alone.

Total autonomy scores ranged from 57 to 148, with a mean of 118.20 (SD=15.35). Based on the DPBS the higher the score, the higher level of autonomy with possible scores ranging from 30 to 150.[19] The instrument scale does not classify a range for scoring. When compared to other DPBS instrument research results, these findings show that dental hygienists within this sample perceived high levels of autonomy. Table III displays the DPBS results for registered dental hygienists and other professions that have completed the DPBS survey.

The DBPS used a 5-point Likert scale ranging from 1 (not at all true) to 5 (extremely true).[19] Table IV displays the mean results of the DPBS instrument for the 4 subscales based on state dental supervision level: readiness, empowerment, actualization, and valuation.[19] The Readiness subscale had 11 item statements and measured elements of skills, competence, and mastery. The Empowerment subscale had 7 items and measured the acceptability of performance in a practice setting. The Actualization subscale included 9 items and

Figure 3: Frequency Distribution of Study Participant's Years of Clinical Experience

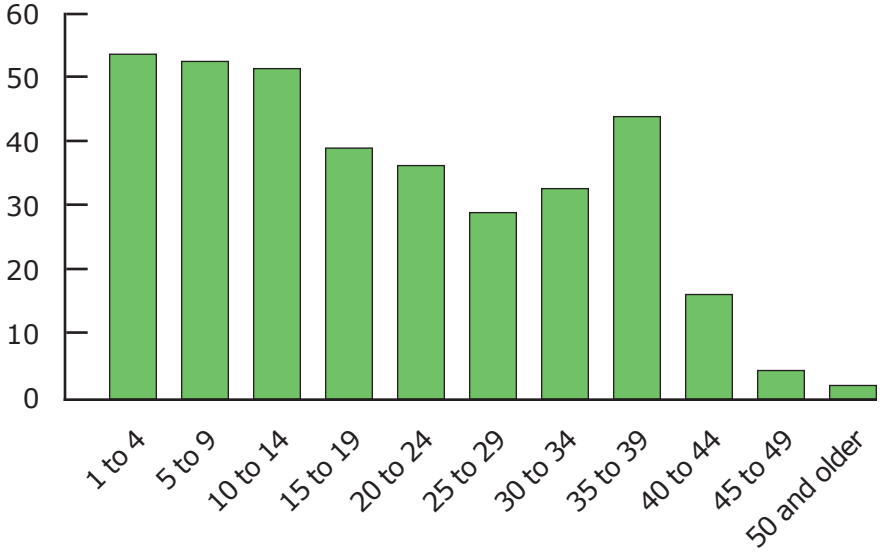


Figure 4: Frequency Distribution of Study Participant's Educational Level

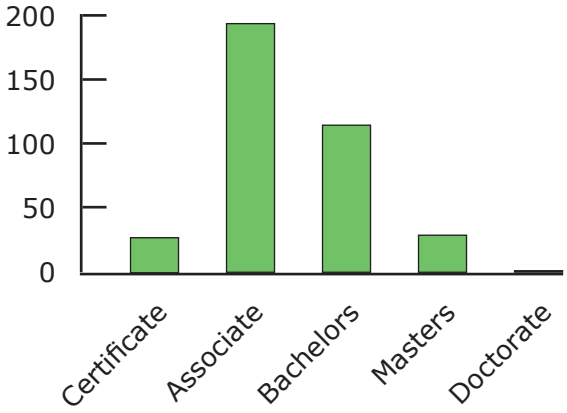


Figure 5: Frequency Distribution of Study Participant's State of Residency

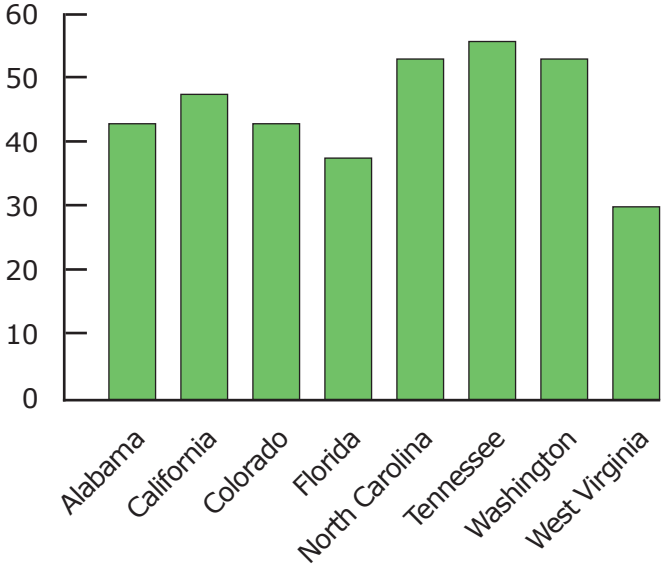


Table II: Dependent Variable ANOVAs based on DPBS Scores and MANOVA Results

Control Variable	ANOVA Significance Level ($p<0.05$)	MANOVA Significance Level with Dental Supervision ($p<0.05$)
Age	0.164	0.018*
Gender	0.981	0.000*
Employment Status	0.099	0.034
Years of Clinical Experience	0.894	0.088
Educational Background	0.314	0.004*
State Dental Supervision Level	0.080	N/A

*MANOVA results that show significant difference among DPBS scores when compared to state dental supervision levels

measured accountability, decision making, determination, responsibility. The Valuation subscale included 3 items and measured elements of worth, value, merit, and usefulness related to autonomy in practice.

Discussion

Overall, the sample of dental hygienists had a DPBS mean score of 118.2 out of a range of 30 to 150 autonomy level score. This finding supports research from McCain, which found that Virginia dental hygienists had a strong belief in competency skills and desire to work in nontraditional settings, under general dentist supervision.[21] For example, the current study found that American registered dental hygienists had a higher DPBS mean score than registered nurses from Thailand, Taiwan, and the U.S. These findings also corroborate the findings of Turner et al., who found that European dental hygienists feel competent to complete some preventive dental care services unsupervised.[22] The Turner et al study surveyed 150 dental hygienists, 183 hygiene-therapists, and 152 dental therapists from England, Scotland, Wales, and Northern Ireland and found that these providers felt competent to diagnosis periodontal disease and provide preventive dental care without a supervising dentist on the premises. In addition, the findings of this current study agree with the findings of Robinson et al. that found military nurses in highly ordered settings similar to direct supervision have less autonomy.[23] General supervision dental hygienists have the ability to work independently in some settings, whereas the dental hygienists in the direct supervision states are unable to work independently in any settings and had the lowest autonomy DPBS mean score of the 4 supervisory categories in the current study.

This study revealed that one possible explanation of why direct access dental hygienists do not have a higher level of autonomy is due to bureaucratic restrictions where they are employed. For example, a 51 to 55-year-old female direct access clinician from California with 20 to 24 years of dental hygiene experience stated, "My office has made their own rules and in many ways my decisions are limited due to not being able to decide without a dentist giving the okay for treatment. Sometimes they agree and sometimes not." Other DPBS survey comments argued the requirement of completing different state clinical board examinations if moving from state to state restricts autonomy. Therefore, dental hygienists within the direct access states are experiencing different restrictions to providing unsupervised preventive dental treatment to underserved populations from the other dental supervision leveled states; however, they are still experiencing restrictions.

Table III: Dempster Practice Behaviors Scale for Various Professions

Country and Profession	Mean	Standard Deviation	n
Thailand registered nurses[12]	91.65	9.79	614
Taiwan registered nurses[13]	107.00	13.40	286
American registered nurses[14]	116.99	12.94	100
American dental hygienists	118.2	15.35	360
American nurse practitioners[15]	127.00	10.25	48

Educational level, gender, and age appear to affect the level of professional autonomy among the dental hygienists within the 8 states of this study. Therefore, prospective research that explores a deeper understanding of these results may reveal currently unknown aspects of dental hygienists and state supervision levels.

There are limitations within this study. First, survey results gathered from the small random sample of 360 participants cannot be generalizable to a larger population of dental hygienists in the U.S. when they have unique levels of dentist

Table IV: Dempster Practice Behaviors Scale Subscale Results

DPBS Subscale	Mean DPBS Score				
	Direct Access (n=91)	Direct Access/ General Supervision (n=88)	General Supervision/Direct Supervision (n=88)	Direct Supervision (n=93)	Total
Readiness: Skill, Competence and Mastery	3.7877	3.7458	3.8430	3.7204	3.7742
Empowerment: Legal Rights, Status and Privileges	3.5831	3.3214	3.5211	3.1059	3.3854
Actualization: Accepting Responsibility, Decision Making and Action Accountability	4.4554	4.4015	4.5139	4.4169	4.4469
Valuation: Self-Respect, Worth, Job Satisfaction and Achievement	4.3004	4.2576	4.3977	4.3764	4.3340
Total	4.0317	3.9316	4.0689	3.9049	–

Note: Possible DPBS scores range from 1 (least autonomous) to 5 (most autonomous)[11]

supervision. The study sample may not be representative of the larger dental hygienist population thus hindering external validity. Second, the sample of male dental hygienists and educators that participated in the study was limited. Numbers of male dental hygienists vary as do numbers of dental hygiene educational programs between states limiting the ability to generalize the results. Third, the topic of dental hygiene independent practice and self-regulation is controversial. Participants may not have been willing to respond to the survey if they were not absolutely certain of anonymity or how the study results were to be used. Therefore, the participants could have failed to respond truthfully. Lastly, registered dental hygienists who are interested in independent practice and self-regulation for the profession may have been more likely to participate in the study compared to registered dental hygienists that have less interest in becoming autonomous. The study results that show a high level of autonomy among dental hygiene participants may be due to a more autonomous study sample.

Further studies on the attitudes of dental hygienists toward independent practice and professional autonomy are warranted. This study's small random sample did not show a difference in autonomy levels among dental hygienists based on employment status or years of clinical experience when state dentist supervision levels were taken into consideration. A larger study sample size needs to be obtained in order to capture a broader range of participants. In addition, a qualitative study could further investigate why dental hygienists from this study feel "taken advantage of by dentists".

Conclusion

The DPBS scores of the study sample suggest that dental hygienists feel prepared and competent to perform preventive dental hygiene services without dentist supervision. The attitudes of the dental hygienists from each of the 4 state dentist supervision levels supports a move toward achieving professional jurisdiction of preventive dental care within the U.S. For this shift in bureaucratic power to occur, a disruption in dental tasks and jurisdictions must transpire between the dental and dental hygiene professions.

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