

## Assuring Dental Hygiene Clinical Competence for Licensure: A National Survey of Dental Hygiene Program Directors

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### Introduction

Performing a clinical examination to obtain an initial dental hygiene license continues to receive national attention due to questioning the validity, reliability and ethical issues of this process.<sup>1</sup>

The one-time clinical examination for dental hygiene licensure may not be a valid assessment of clinical competency. Inconsistencies between the student's performance at an accredited dental hygiene program and performance on this clinical examination concern educators. Both dental hygiene and dental educators have witnessed some of their most clinically competent students fail the clinical examination, and the passing of students less competent, based on their performance during the program.<sup>2,3</sup> A 2001 study of dental hygiene program directors concluded that competence for initial licensure is best determined through continual assessment over time rather than a one-time examination.<sup>1</sup>

The one-time clinical examination may also not be reliable to assess competency. Oral conditions of humans are so variable making it impossible to standardize the level of treatment difficulty across the student candidates.<sup>4</sup> Another concern is the increasing difficulty identifying patients who meet the clinical criteria of the state and regional tests.

The use of a live patient in the one-time clinical examination raises ethical issues and continues to be the greatest source of dissatisfaction with the licensure examination.<sup>5</sup> The arguments raised against using

### Abstract

**Purpose:** To conduct a national survey of dental hygiene program directors to gain their opinions of alternative assessments of clinical competency, as qualifications for initial dental hygiene licensure.

**Methods:** A 22 question survey, comprised of statements eliciting Likert-scale responses, was developed and distributed electronically to 341 U.S. dental hygiene program directors. Responses were tabulated and analyzed using University of California, San Francisco Qualtrics® computer software. Data were summarized as frequencies of responses to each item on the survey.

**Results:** The response rate was 42% (n=143). The majority of respondents (65%) agreed that graduating from a Commission on Dental Accreditation (CODA)-approved dental hygiene program and passing the national board examination was the best measure to assure competence for initial licensure. The addition of "successfully completing all program's competency evaluations" to the above core qualifications yielded a similar percentage of agreement. Most (73%) agreed that "the variability of live patients as test subjects is a barrier to standardizing the state and regional examinations," while only 29% agreed that the "use of live patients as test subjects is essential to assure competence for initial licensure." The statement that the one-time state and regional examinations have "low validity in reflecting the complex responsibilities of the dental hygienist in practice" had a high (77%) level of agreement.

**Conclusion:** Most dental hygiene program directors agree that graduating from a CODA-approved dental hygiene program and passing the national board examination would ensure that a graduate has achieved clinical competence and readiness to provide comprehensive patient-centered care as a licensed dental hygienist.

**Keywords:** dental hygiene, licensure, clinical competence, education

This study supports the NDHRA priority area, **Professional Education and Development:** Critically appraise current methods of evaluating clinical competency (dental hygiene graduation competencies, standardized national board testing, clinical board examinations).

live patients include delaying necessary treatment on a patient waiting for the licensure examination, potential risks of treating a live patient in a highly

stressful environment, patient discomfort with the duration of the exam, the liability of inappropriate treatment and the high expense of compensating board patients.<sup>4,6</sup> A 1999 national survey of dentists reported the following ethical issues related to their clinical licensure examinations: no arrangement for indicated follow-up care for their patient (23.9%), unnecessary radiographs (32.5%), coercion of patient into an inappropriate treatment choice (13.7%), and premature or overly aggressive patient treatment (19.3%).<sup>7</sup>

Because of these issues, the American Dental Association (ADA) House of Delegates adopted resolution 64H, which called for elimination of the use of human subjects for testing competency of dentists for state licensure by 2005.<sup>8</sup> Although this resolution passed the House of Delegates by a clear majority, a satisfactory replacement for initial licensure examination for dentistry has not been demonstrated. Traditional clinical examinations for dental hygiene also continue to be scrutinized.

The purpose of this study was to conduct a national survey of dental hygiene program directors to gain their opinions of alternative assessments of clinical competency, as qualifications for initial dental hygiene licensure.

## Methods and Materials

This cross-sectional survey was conducted as approved by the Institutional Review Board of the University of California, San Francisco (UCSF). The study population consisted of directors of all the Commission on Dental Accreditation (CODA)-approved entry-level U.S dental hygiene programs. Addresses were obtained from the American Dental Hygienists' Association (ADHA).<sup>9</sup>

The 22 question survey, designed by the researchers, was comprised of statements using a Likert scale, an item that asked for additional suggestions/comments, and questions pertaining to the respondents' degree, title and program demographics. In order to standardize respondents' understanding of competency, the researcher included a definition from the ADHA in the survey. The ADHA defines competency as the skills, understanding and professional values of an individual ready to begin practicing dental hygiene.<sup>10</sup> A pre-test was conducted on a convenience sample of 3 dental hygiene program educators in 2 CODA-approved entry-level dental hygiene programs, to test the survey questions for content validity and clarity. Revisions were made based on the feedback received, prior to conducting the survey.

The survey was administered with the assistance of UCSF Qualtrics® computer software.<sup>11</sup> The 341 dental hygiene program directors in the U.S. were invited to participate in this study. They were contacted via electronic mail with a cover letter explaining the purpose of the study, informed consent and a customized link to the survey instrument. The online survey was programmed to send 3 reminders to non-responders without identifying the responders' e-mail addresses.

Data analysis was conducted with the assistance of UCSF Qualtrics® computer software. The number of responses was tabulated for each question. Additional comments were recorded. Simple descriptive statistics were calculated and data summarized as percentages of responses to each item from the survey.

## Results

Of the 341 dental hygiene program directors who were contacted to participate in this survey, 143 responded, resulting in a response rate of 42%. After 4 mailings, 132 respondents had completed the survey. Because not all respondents answered every question, the number of responses to each question varies.

The institutional settings of the respondents' programs represented every type of dental hygiene program settings, with the most numerous (56%) setting being a public community or junior college. A university or 4 year college not affiliated with a dental school was the setting for 20%, a 4 year college affiliated with a dental school 13%, with the remainder (14%) being situated in a technical college or institute, vocational school, or other type (responses totaled more than 100% because some respondents indicated more than one). Almost all (98%) of the respondents were program directors of dental hygiene programs. Most (79%) of the respondents were dental hygienists with a master's degree and 7% were dentists. Each of the regional testing agencies was represented among the respondents. The Western Regional Examining Board was the clinical examination taken by most (36%) of the respondents' students.

The respondents' levels of agreement to 8 statements regarding the best measures of assuring clinical competence for initial dental hygiene licensure are exhibited in Table I. All 8 statements included the core qualifications of graduating from a CODA-approved dental hygiene program and passing the national board examination. Of the 8 statements, the majority (65%) of respondents agreed that in addition to core qualifications the best measure was

Table I: Agreement Level of Respondents to 8 Statements Regarding the Best Measures of Assuring Clinical Competence for Initial Licensure

The best measure of assuring clinical competence for initial licensure includes: graduating from a CODA- approved dental hygiene program and passing the national board examination AND	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Number of Respondents
No further qualifications	30%	33%	13%	20%	4%	132
Successfully completing community off-site rotations, supervised by a clinical faculty member	8%	17%	39%	29%	7%	132
Passing a case-based computer- simulated examination	6%	20%	29%	36%	8%	132
Passing a dental ethics and jurisprudence examination	18%	25%	31%	24%	5%	132
Providing documentation of successful completion of all competency evaluations in a student-constructed portfolio	17%	29%	23%	24%	7%	132
Successfully completing all programs' competency evaluations	24%	41%	19%	10%	7%	131
Passing a case-based computer- simulated exam, providing documentation of successful completion of all competency evaluations in a student -constructed portfolio and passing a dental ethics and jurisprudence examination	26%	23%	27%	18%	7%	128
Passing a standardized (state-board like) clinical examination, administered by state registered dental hygiene examiners at students dental hygiene program site	12%	20%	18%	35%	15%	130

"successfully completing all program's competency evaluations." "No additional qualifications" was selected by a similar percentage of respondents. However, when responses of "agreed" and "strongly agreed" were separated, a greater percentage (30%) of respondents selected "strongly agreed" for the statement "no additional qualifications" than the percentage (24%) that strongly agreed to the statement, which added, "successfully completing all program's competency evaluations" to the core qualifications. More than one-third of the respondents disagreed with the addition of either "passing a case-based computer-simulated examination" or the addition of "passing a standardized clinical examination, administered by state registered dental hygiene examiners at students' dental hygiene program site." "Successfully completing community off-site rotations, supervised by a clinical faculty member" elicited the greatest percentage of ambivalent (neither agree nor disagree) responses (39%).

Most respondents (73%) agreed to the statement, "the variability of live patients as test subjects is a barrier to standardizing the state and regional examinations" (Table II). Correspondingly, only 29% agreed that the "use of live patients as test subjects is essential to assure competence for initial licensure."

The statements that the one-time state and regional examinations "have low validity in reflecting the complex responsibilities of the dental hygienist in practice" and "do not test a candidate's ability to treat a patient in a clinical practice condition" were agreed upon by the majority of respondents (Table III). Very few (5%) strongly agreed that these one-time examinations "are reliable and valid for assuring clinical competence for initial licensure."

The respondents' rankings of their 6 preferred measures of clinical competence, in addition to

Table II: Agreement Level of Respondents to Statements Regarding the Use of Live Patients as Test Subjects for Initial Dental Hygiene Licensure

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Number of Respondents
The use of live patients as test subjects is essential to assure clinical competence for initial licensure	14%	15%	18%	31%	23%	130
The use of live patients as test subjects to assess the potential lack of competence for initial licensure could be detrimental to the test subject	14%	37%	22%	19%	7%	129
The variability of live patients as test subjects is a barrier to standardizing the state and regional examination	38%	35%	11%	12%	5%	130

Table III: Agreement Level of Respondents to Statements Regarding the One-Time State and Regional Clinical Examinations

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree	Number of Respondents
The one-time state and regional examinations						
Do not test a candidate's ability to treat a patient in a clinical dental practice condition	38%	35%	12%	12%	3%	130
Have low validity in reflecting the complex responsibilities of the dental hygienist in practice	38%	39%	10%	10%	2%	130
Can be subjective when determining an acceptable patient for the test subject	34%	37%	14%	14%	1%	129
Are reliable and valid for assuring clinical competence for initial licensure	5%	10%	19%	37%	29%	128

graduating from a CODA-approved dental hygiene program and passing the national board examination, are displayed in Table IV. "The successful completion of program's competency evaluations" was ranked number one by 50% of the respondents and number two by 24% of the respondents. The least popular option was off-site community rotations, supervised by a clinical faculty member, ranking number five and number six by most respondents.

The additional suggestions and comments mostly reiterated the results that we have stated. The only new suggestion was a one-year residency in addition to the core qualifications.

## Discussion

The purpose of this study was to conduct a national survey of dental hygiene program directors to gain their opinions of potential alternative assessments of clinical competency, as qualifications for initial dental hygiene licensure. The results dem-

onstrate that the majority of respondents strongly agreed that the best measures of assuring clinical competence for initial dental hygiene licensure is graduating from a CODA-approved dental hygiene program and passing the national board examination. Completing all of the program's competency evaluations, in addition to the qualifications stated above, was also frequently selected as a best measure to assure competence. Program directors may have agreed that this was an important addition to the other two measures of assuring clinical competence to emphasize the importance of competency evaluations in a program's requirements for graduation. Most respondents also agreed that the variability of live patients as test subjects is a barrier to standardizing the state and regional examinations and that the one-time examinations have low validity in reflecting the complex responsibilities of the dental hygienist in practice.

Graduating from an accredited program and passing a standardized examination are common

Table IV: Respondents' Rankings of Their Preferred Measure of Assuring Clinical Competence, in Addition to Graduating From a CODA-Approved Dental Hygiene Program and Passing the National Board Examination

Additional qualifications	#1	#2	#3	#4	#5	#6
Student-constructed portfolio providing documentation of competencies	14	27	17	24	15	17
Case-based computer simulated examination	12	18	22	30*	23	14
Standardized clinical examination at each program (similar to state boards), conducted by state registered dental hygienist examiners	27	13	20	7	17	22
Dental ethics and jurisprudence examination	2	19	27*	28	20	23
Off-site community rotations supervised by a clinical faculty member	2	12	18	18	31*	32*
Successful completion of program's competency evaluations	64*	31*	13	10	5	2

Values represent the number of respondents selecting the specific measure of assuring clinical competence for a specific rank (#1 to #6).

\*Refer to the highest number of responses to the specific ranking.

requirements for initial licensure of other health care professionals. In nursing the requirements for initial licensure include earning a degree from a nursing program that is accredited by the Accreditation Commission for Education in Nursing (ACEN) and passing a computer-administered multiple choice National Council Licensure Examination for Registered Nurses test. Nursing measures clinical competence by assessments of increasingly difficult skill sets, related to the implementation of patient care, during the consecutive semesters of the nursing programs.<sup>12,13</sup> Assessing clinical competency throughout the program was also popular with our respondents.

Competency statements, which detail the expected abilities of a dental hygienist entering the profession, were developed by the American Dental Education Association (ADEA). These statements have been beneficial when assessing the competence of dental hygiene students and maintaining and improving the quality of dental hygiene curricula. Dental hygienists must be competent in 5 domains for entry into the profession: core competencies, health promotion/disease prevention, community, patient/client care, and professional growth and development.<sup>14</sup>

The CODA accreditation process of entry-level dental hygiene programs assures that the programs will comply with all the defined standards. These standards are based on sound educational principles that ensure quality educational opportunities. Stan-

dards also specify the graduates' required competence in various dental hygiene services. Awareness of these stringent educational standards may have influenced the respondent's decision that graduating from a CODA-approved dental hygiene program is adequate to ensure clinical competence.<sup>15,16</sup> The results of a 2001 study were very similar to ours in that the dental hygiene program directors believed that clinical competence is best determined throughout the program, with strict adherence to competency standards mandated by the accreditation process.<sup>1</sup>

The dental hygiene national board examination has been included in each of the qualifications from which the respondents were to select. The dental hygiene national board examination assesses the students' theoretical and applied knowledge in the basic biomedical, dental, dental hygiene clinical sciences and community health. The dental hygiene national board examination also reflects the clinical practice of the dental hygienist by including patient case studies.<sup>17</sup> The educational standards of the program are indirectly evaluated by considering the pass rate of the program's students. With a continual low pass rate, the quality of the program would be a concern.

The survey offered the respondents the opportunity to select qualifications, in addition to graduating from a CODA-approved dental hygiene program and passing the national boards. Successfully completing all programs' competency evaluations

was the only additional qualification, which received significant support. Student-constructed portfolios have been introduced in dental hygiene education as a means for students to document successful completion of competency evaluations.<sup>18</sup> However, less than half of the respondents selected that as an additional measure of assuring clinical competence. Incorporation of constructing portfolios into the program's requirements comes with the challenges of being labor intensive for the students and for the faculty who evaluate the portfolios.<sup>19</sup> With the passage of Assembly Bill 1524, dental students in California have the option of taking a school-based licensure examination, which entails building a portfolio of completed clinical experiences and competency evaluations in 7 subject areas throughout their final year of dental school.<sup>20</sup> The use of computer technology was also not popular with the respondents of the current study, as evidenced by the low agreement with passing a case-based computer-simulated examination. The state of Minnesota has been using a non-patient, computer-based simulation, titled the objective structured clinical examination (OSCE), to evaluate both clinical and theoretical knowledge. The examination utilizes patient cases with medical and dental histories, radiographs, intra-oral photographs, study models, and/or patient records. Candidates rotate through standardized stations on a timed circuit, with a different, impartial examiner at each station.<sup>21-23</sup>

Even though the clinical licensure examinations are a long-standing tradition, many studies collectively provide evidence that both dental and dental hygiene educators question the validity of a one-shot clinical licensure examination.<sup>7,24-26</sup> Inconsistencies between a student's performance in an accredited dental hygiene program and performance on these clinical examinations concern educators. Both dental hygiene and dental educators have witnessed some of their most clinically competent students fail the clinical examination,<sup>2,3</sup> and the passing of students less competent, based on their performance during the program.<sup>3</sup> Validity is best determined through an accumulation of competencies, as compared to a one-shot, one-day examination with many variables.<sup>25,27</sup> It is interesting to note that the results of our research and those of a comparable study in 2001 are very similar. In both these studies the majority of dental hygiene program directors believed that clinical competence is best determined throughout the program, rather than from a single examination.<sup>1</sup>

The general consensus of program directors was negative regarding the use of live patients as test subjects. This agrees with the policy statements from the major dental hygiene and dental organiza-

tions. The ADHA supports research to "identify and implement a valid, reliable alternative to the use of human subjects in clinical licensure examinations."<sup>28</sup> The ADA supports the "elimination of human subjects/patients in the clinical licensure examination process and encourages all states to adopt methodologies that are consistent with this policy."<sup>29</sup> In 2011, the ADEA House of Delegates passed a "resolution for the elimination of live patient examinations for dental licensure by 2015."<sup>30</sup>

Profiles, trends and changes in dental hygiene education and practice have been reported for 19 countries.<sup>31</sup> The method of regulation (i.e., licensure) varied by the country, with the most predominant method being proof of graduation from a recognized dental hygiene educational program with no further credential (i.e., qualification) being required. Thirty-seven percent of the 19 countries used this method of regulation.<sup>31</sup>

The suggestion of the completion of a 1 year residency, similar to the model for dental licensure, may not be appropriate for dental hygiene.<sup>32</sup> Dental hygiene education has significantly shorter curriculum requirements than dentistry; some programs are only of 18 month duration. So, an additional year may not be acceptable to individuals associated with those programs. However, it is interesting to note that more dental students are considering the 1 year Advanced Education in General Dentistry programs as a pathway to dental licensure.<sup>33</sup>

One limitation of this study is the low response rate. Some program directors may not have responded due to their being inundated with a large number of surveys from students of baccalaureate degree completion and master degree programs. The low response rate may also be a reflection of this being an Internet survey, rather than a mailed survey. Studies have demonstrated that Internet surveys tend to have lower response rates than mailed ones.<sup>34,35</sup> Internet surveys have increased in popularity due to their ease of administration. However, much is unknown as to their effectiveness and effect on response bias, particularly in the population of health care professionals.<sup>36,37</sup>

## Conclusion

Licensure issues continue to be in the forefront of concerns for dental hygiene educators. The dental profession appears to be moving toward licensure methods that would be based on evaluation of students by the educational institution. The results of our study support this view for dental hygiene licensure: that the emphasis must be on the assessment of the student's performance throughout

the program, rather than on a one-time clinical examination for licensure. Because the stringent educational standards of CODA maintain the quality of dental hygiene programs, graduating from a CODA-approved dental hygiene program and passing the national boards should be sufficient for graduates to have achieved clinical competence and readiness to provide comprehensive patient-centered care as a licensed dental hygienist.

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## References

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1. Patrick T. Assessing dental hygiene clinical competence for initial licensure: A delphi study of dental hygiene program directors. *J Dent Hyg.* 2001;75(3):207-213.
2. Gadbury-Amyot CC, Bray KK, Branson BS, et al. Predictive validity of dental hygiene competency assessment measures on one-shot clinical licensure examinations. *J Dent Educ.* 2005;69(3):363-370.
3. Chambers DW. Lessons in shifting the burden: #2. competence to practice. *J Am Coll Dent.* 2011;78(4):2-3.
4. Formicola AJ, Shub JL, Murphy FJ. Banning live patients as test subjects on licensing examinations. *J Dent Educ.* 2002;66(5):605-609.
5. Ranney RR, Haden NK, Weaver RW, Valachovic RW. A survey of deans and ADEA activities on dental licensure issues. *J Dent Educ.* 2003;67(10):1149-1160.
6. Lantzy MJ, Muzzin KB, DeWald JP, Solomon ES, Campbell PR, Mallonee L. The ethics of live patient use in dental hygiene clinical licensure examinations: A national survey. *J Dent Educ.* 2012;76(6):667-681.
7. Feil P, Meeske J, Fortman J. Knowledge of ethical lapses and other experiences on clinical licensure examinations. *J Dent Educ.* 1999;63(6):453-458.
8. American Dental Association. The Impact of the Elimination of the Use of Human Subjects in the Clinical Licensure Examination Process by 2005 from the Dental And Dental hygiene Licensure Communities' Perspective. American Association of Dental Boards [Internet]. 2001 [cited 2015 February 10]. Available from: <http://dentalboards.org/positionstatements/LivePatient.pdf>
9. Entry-Level Dental Hygiene Programs. American Dental Hygienists Association [Internet] 2013 [cited 2013 March 29]. Available from: [http://www.adha.org/resourcesdocs/71617\\_Entry\\_Level\\_Schools\\_By\\_States.pdf](http://www.adha.org/resourcesdocs/71617_Entry_Level_Schools_By_States.pdf)
10. American Dental Education Association House of Delegates 2003. Competencies for entry into the profession of dental hygiene. *J Dental Educ.* 2004;68(7):745-749.
11. Sophisticated Research Made Simple. Qualtrics [Internet]. 2013 [cited 2013 March 20]. Available from: <http://www.ucsf.qualtrics.com>
12. Scott Tilley DD. Competency in nursing: A concept analysis. *J Contin Educ Nurs.* 2008;39(2):58-65.
13. Nielsen AE, Noone J, Voss H, Mathews LR. Preparing nursing students for the future: An innovative approach to clinical education. *Nurse Educ Pract.* 2013;13(4):301-309.
14. American Dental Education Association House of Delegates 2011. ADEA competencies for entry into the allied dental professions. *J Dent Educ.* 2011;75(7):941-948.

15. Commission on Dental Accreditation: Accreditation Standards for Dental Hygiene Education Programs. American Dental Association [Internet]. 2013 [cited 2013 March 20]. Available from: <http://www.ada.org/en/coda/current-accreditation-standards/>
16. Boyleston ES, Collins MA. Advancing our profession: Are higher educational standards the answer? *J Dent Hyg.* 2012;86(3):168-178.
17. Kramer GA, Neumann LM. Validation of the national board dental hygiene examination. *J Dent Hyg.* 2007;81(3):655-663.
18. Jackson SC, Murff EJ. Effectively teaching self-assessment: Preparing the dental hygiene student to provide quality care. *J Dent Educ.* 2011;75(2):169-179.
19. Conrad HJ, Mills EA. Dental students choosing licensure path give more consideration to career flexibility rather than ethical dilemmas. *J Am Coll Dent.* 2011;78(1):24-32.
20. Fox K. California OKs nation's first portfolio exam for licensure. American Dental Association [Internet]. 2010 [cited 2013 March 20]. Available from: <http://www.ada.org/489.aspx>
21. Gerrow JD, Murphy HJ, Boyd MA, Scott DA. Concurrent validity of written and OSCE components of the Canadian dental certification examinations. *J Dent Educ.* 2003;67(8):896-901.
22. Mensing C. Guest editorial: The non-patient based clinical examination: An update. *Northwest Dent.* 2009;88(6):10-11.
23. Navickis MA, Bray KK, Overman PR, Emmons M, Hessel RF, Cowman SE. Examining clinical assessment practices in U.S. dental hygiene programs. *J Dent Educ.* 2010;74(3):297-310.
24. Chambers DW. Board-to-board consistency in initial dental licensure examinations. *J Dent Educ.* 2011;75(10):1310-1315.
25. Ranney RR, Gunsolley JC, Miller LS, Wood M. The relationship between performance in a dental school and performance on a clinical examination for licensure: A nine-year study. *J Am Dent Assoc.* 2004;135(8):1146-1153.
26. Stewart CM, Bates RE Jr, Smith GE. Does performance on school-administered mock boards predict performance on a dental licensure exam? *J Dent Educ.* 2004;68(4):426-432.
27. Palcanis K, Lantz M. Continued competency in the specialties and academics. *J Am Coll Dent.* 2012;79(3):28-32.
28. American Dental Hygienists' Association Educational Standards Position Paper 2011. Position Paper ed. American Dental Hygienists' Association [Internet]. 2011 [cited 2015 February 10]. Available from: [http://www.adha.org/resources-docs/7113\\_Educational\\_Standards\\_Position\\_Paper.pdf](http://www.adha.org/resources-docs/7113_Educational_Standards_Position_Paper.pdf)
29. ADA Council on Ethics, Bylaws, and Judicial Affairs. Ethical considerations when using human subjects/patients in the examination process. American Dental Association [Internet]. 2012 [cited 2015 February 10]. Available from: [http://www.ada.org/pdfs/code\\_of\\_ethics\\_2012.pdf](http://www.ada.org/pdfs/code_of_ethics_2012.pdf)
30. Proceedings of the 2011 ADEA house of delegates. *J Dent Educ.* 2011;75(7):857-888.
31. Johnson PM. International profiles of dental hygiene 1987 to 2006: A 21-nation comparative study. *Int Dent J.* 2009;59(2):63-77.
32. Lasky RE, Shub JL. Dental licensure reaches a crossroads: The rationale and method for reform. *J Dent Educ.* 2003;67(3):295-300.
33. Spears R, Leite LP, Schnell RA, Dellinges M, Brooks HE, Itaya LE. AEGD programs: Why now, why more? *J Dent Educ.* 2013;77(1):17-23.
34. Leece P, Bhandari M, Sprague S, et al. Internet versus mailed questionnaires: A controlled comparison. *J Med Internet Res.* 2004;6(4):39-54.
35. Lusk C, Delclos G, Burau K, Drawhorn D, Aday L. Mail versus internet surveys. *Eval Health Prof.* 2007;30(2):186-201.
36. Gigliotti LM. Comparison of an internet versus mail survey: A case study. *Human Dimensions of Wildlife.* 2011;16(1):55-62.
37. Vaske JJ. Advantages and disadvantages of internet surveys: Introduction to the special issue. *Human Dimensions of Wildlife.* 2011;16(3):149-153.