Dental Hygiene Program Directors' Knowledge and Implementation of OSCE Testing

by

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A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science
Dental Hygiene
in the University of Michigan
2019

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Dedication

I dedicate this thesis to my husband Scott and children April, Mason, Karrigan, and Lennox. Thank you for the countless personal sacrifices that you have made so that I could pursue my dreams. Your selfless love made this research possible.

I further dedicate this work in loving memory of my father, Donald L. Yearsovich. His fatherly advice to “throw my hat in the ring”, influenced my decision to apply to graduate school. Thank you, Dad, for pushing me to go one step further… Love, Bug

Acknowledgements

I would like to convey my sincerest gratitude to Drs. Danielle Furgeson and William Giannobile for allowing me to be the first Master of Science in Dental Hygiene Teaching and Clinical Research Fellow, at the University of Michigan School of Dentistry. Without Dr. Furgeson's vision of the fellowship and Dr. Giannobile's support, this experience would not have been possible.

I would like to recognize my committee members, Clinical Assistant Professor and Thesis Committee Chair Danielle Furgeson, Clinical Lecturer Dina Korte, Clinical Professor Tae-Ju Oh, and Research Psychologist Katherine Buchholz. I appreciate your expertise and commitment to my thesis research project.

I would also like to thank Iwonka Eagle, Nolan Kavanaugh, and Samantha Mishler for your mentorship along the way.

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Abstract

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Objective Structured Clinical Examinations (OSCEs) have been established as a gold standard assessment for determining clinical competence. The Coalition for Dental Licensure Reform called for the acceptance of the Dental Licensure Objective Structured Clinical Examination (DLOSCE) to replace the live-patient examinations (LPE) for dental licensure, which are often viewed as biased, unreliable, and in some cases unethical. The purpose of this study was to assess dental hygiene program directors' awareness of and attitudes toward a DLOSCE, whether their curricula included OSCEs, and perceived barriers to implementing OSCE's. **Methods:** IRB Exemption was obtained (HUM00147564). A nine-question electronic survey was developed, pilot tested by five-dental hygiene program directors across three-dental hygiene institutions and was then emailed to 332 dental hygiene program directors across the United States. **Results:** A response rate of 36% (n=121) was achieved. Nearly 30% of respondents were unaware of the developing DLOSCE, however 80% were in favor of the decision. Nearly 75% considered OSCEs as valid assessments of clinical competence. Over half of program directors reported not currently utilizing OSCE in their curricula. Time (22%), perceived lack of best practices (21%), and lack of resources (18%) were reported as significant barriers. Program directors who currently employed OSCE's were more likely to agree OSCEs were both valid and reliable assessments (p=.05). **Conclusion:** The majority of dental hygiene program directors were in favor of eliminating the single-encounter, LPE in favor of an OSCE for licensure. However, more than half do not currently utilize OSCEs for clinical assessments

within their programs. Further studies should explore implementation of OSCEs in dental hygiene education, and how a potential Dental Hygiene Licensure-OSCE might impact the current educational curricula and licensure of dental hygienists in the United States.

Chapter 1

Introduction

1.1 Problem Statement

The purpose of clinical licensure examinations are for clinicians to demonstrate their knowledge to a governing agency prior to serving the public.[1,2] Debates surrounding the use of human subjects in dental and dental hygiene clinical licensure examinations, have been discussed throughout dental organizations and education for decades.[2–5] While some argue the situation necessitates the use of human subjects, others counter that live-patient examinations (LPE) assess a narrow range of clinical skills, and raise considerable ethical concerns for the patient, candidate, and profession.[5] Consequently, alternative methods to assess the clinical competence of dental professionals have been explored across the United States (U.S.) however, LPE remain to be the most frequently used method to date.[6]

Requirements for dental professional licensure in the U.S. include a degree from an accredited program and passing scores on written national board examinations, as well as regional/state clinical examinations.[7] Five-regional testing agencies administer clinical licensure examinations, while individual states have authority over the licenses.[7,8] This current structure limits licensure portability, ultimately limiting where individual dental professionals are allowed to practice within the U.S.

To resolve the issues surrounding LPE and licensure portability, the American Dental Association (ADA), American Dental Education Association (ADEA) formed the Task Force on

Assessment of Readiness for Practice, in 2016. In 2017, the Task Force issued a report recommending further development and pilot testing of alternative clinical licensure examinations. The American Student Dental Association (ASDA) then joined the Task force, forming the Coalition Reform for Licensure. This coalition called for the abolishment of LPEs and the acceptance of Objective Structured Clinical Examinations (OSCEs) as a valid replacement. Additionally, the report recommended that state dental boards collaborate to alter the current licensure structure; proposing the establishment of universally accepted credentials that ascertain competency to practice, listing OSCEs as a federally recognized solution to the portability issues.[9]

Since the mid-1970's OSCEs have been universally recognized as the gold standard for the assessment of clinical competence of allied health and other professional students.[10,11] The purpose of an OSCE is to minimize patient and evaluator variations while standardizing the skills and knowledge assessed.[10,12,13] OSCEs are designed to include multiple timed stations that are often supervised by a calibrated proctor. Stations require the application of critical thinking and/or a clinical skill, while never altering the health-status of a human subject. [10,11] Furthermore, OSCEs have been incorporated in dental school curricula since the 1990's to assess various skill sets including communications, patient education, clinical skills, and critical thinking.[11,14,15]

At this time, OSCEs are used as measures for licensure examinations by the United States Medical Licensing Examinations, the Medical Council of Canada Qualifying Examination, and the National Dental Board Examination (NDBE) Canada OSCE.[16–19] Due to the success of the NDBE Canada OSCE, the ADA Board of Trustees voted to adopt the Dental Licensure

Objective Structured Clinical Licensure Examination (DLOSCE). A pilot of the DLOSCE is scheduled to take place in 2019 and is planned to replace LPE by August 2020.[20,21]

Currently, the DLOSCE will only affect dental candidates for licensure in the United States. Little is known regarding how similar licensure changes for would impact the current dental hygiene education system as well as dental hygiene licensure. Furthermore, while OSCE utilization is widely recognized in dental schools, a significant gap in the literature exists regarding the use of OSCEs in dental hygiene programs. This raises the question, should dental hygiene licensure eliminate LPE, are dental hygiene programs across the United States equipped to prepare candidates for this professional licensure change.

1.2 Goal Statement

The goal of this cross-sectional study was to assess U.S. dental hygiene program directors' attitudes toward and experience with OSCEs, as well as their knowledge of the developing DLOSCE.

1.3 Specific Aims

Specific Aim 1: To evaluate current utilization of OSCEs within dental hygiene programs across the U.S.

Specific Aim 2: Identify barriers reported by dental hygiene program directors who do not currently utilize OSCEs within program curricula.

Specific Aim 3: To assess dental hygiene program directors' awareness of and attitudes toward the developing DLOSCE.

1.4 Significance

While OSCE utilization in dental curricula is widely recognized,[14,15] literature is scarce regarding the use and perceived barriers of OSCEs in dental hygiene curricula. This is

noteworthy, as currently it is unknown whether dental hygiene licensure will be mandated to replace the long-standing, single-encounter, live-patient clinical licensure examination with an OSCE, like that of dental licensure. Additionally, while limited existing data suggests that dental hygiene program directors favor the elimination of LPEs for licensure,[22] to the researcher's knowledge, no research exists regarding dental hygiene program directors' knowledge of and attitude toward DLOSCE. Therefore, this study serves to assess dental hygiene program director's current utilization and perceived barriers to implementation of OSCEs in their curricula, and to further assess their awareness of and attitudes toward DLOSCE.

1.5 Thesis Overview

An overview of this thesis is provided to assist the audience. Chapter II is the Review of the Literature which discusses the purpose of licensure examinations, concerns surrounding live-patient clinical licensure examinations, and the development of the DLOSCE. The chapter further examines the purpose and standard design of OSCEs. Chapter III discusses the materials and methods used to develop this project. Chapter IV is the results section, and Chapter V and Chapter VI are the discussion and conclusion of the study.

Chapter 2

Review of the Literature

2.1 Introduction

The purpose of licensure exams is to protect the public from unqualified healthcare providers.[1] However, every year thousands of citizens are used as test subjects for dental and dental hygiene clinical licensure examinations. Ethical concerns and questions regarding the validity and reliability of these examinations have been debated by dental organizations for more than half of a century.[2,3,13,22,23] In recent years, alternative clinical licensure examinations have been developed by dental organizations and schools to replace the widely-accepted single-encounter live-patient exam (LPE) which include: (a) one-year general practice residency (PGY-1), (b) clinical portfolio, (c) non-patient based objective structured clinical examination (OSCE). However, the LPE remains to be the most frequently used and accepted method to assess the clinical competence of dental professionals.[6]

2.2 Dental Professional Licensure in the U.S.

The pathway for dental licensure was established in 1929 by the National Board of Dental Examiners (NBDE) .[24] The NBDE oversaw the development and administration of both the written and clinical portions of the licensure examinations. In 1937, the clinical portion of the licensure exam was relinquished to individual state boards of dentistry, subsequently making each state the governing body over dental licenses. Today, the Integrated Joint Commission on National Dental Examinations (IJCNDE) develops and administers the written national board

examinations which are recognized by all states and territories. However, clinical licensure exam acceptance is often limited to specific geographical regions and individual states, limiting licensure portability.

To develop and administer clinical exams, state boards of dentistry have grouped together to form regional boards.[8] These boards rely on regional testing agencies to administer clinical licensure examinations. Though licensure requirements may vary from state to state due to differences in state laws, there are three standard *national* requirements for licensure (a) a degree from an accredited program, (b) a passing score on the written national board examination, (c) a passing score on a regional/state clinical examination.

2.3 Changes in Dental Professional Licensure Examinations

Modern dentistry calls for the modernization of dental professional licensure examinations. The need for licensure reform has been recognized at the national and state levels by dental organizations and leaders in dental education.[1,22,25,26]

Written national licensure examinations. Written board exams were not designed to be comprehensive evaluations, but rather were a means to narrow down the providers who would be capable of patient care.[27] For nearly a decade, the IJCNDE have been in the process of developing the Integrated National Board Dental Examinations (INBDE) to replace the long-standing written licensure examinations. The purpose of these new written board exams are to assess the complex decision making processes of evidence-based dentistry while focusing less on rote knowledge, which has been the standard to date.[28,29] Part I of the INBDE is scheduled to begin August 1, 2020 and INBDE Part II is scheduled to begin August 1, 2022.

Clinical licensure examinations.

Live-patient clinical licensure examinations. Dentistry remains the *only* healthcare profession that requires live-patient examinations for licensure.[30]. Cosby states that these examinations are mechanisms to identify both competence and incompetence in regard to crucial clinical subjects.[1] A 2015 survey of dental hygiene program directors by Fleckner and Rowe, reported that 29% of respondents felt the use of human subjects was essential to assess clinical competence for initial licensure.[31]

Ethical concerns of LPE. The concerns surrounding the use of live patients for licensure examination are well founded, as they introduce by their nature, potential harm of the patient during the delivery of care.[32] As a result, significant ethical challenges have emerged, centering on how the integrity of patient-centered care is compromised through these high-stakes, single-encounter exams. However, the greater ethical challenges center around the recruitment and treatment of these patients prior to, during and post exam. Students paying financial incentives to recruit patients for these exams has long been a challenge. This financial compensation raises the question of whether or not the patients are volunteering or being coerced.[32]

Other common ethical concerns for live patient testing includes the potential and sometimes irreversible harm to patients' health and well-being.[5] In the context of the exam, students are likely to attend more to exam requirements for licensure than the patient's more critical care needs. This care result in mistreatment or delayed care.[2,4] Mistreatment of these patients also occurs once the examination is completed. For example, lack of follow-up care, or failure to plan who is responsible for substandard care, or the correction of substandard care.[2,4,5,32] These acts counter the ethical principles dental professionals are sworn to uphold, which are the same ethical principles taught throughout dental and dental hygiene curricula.

Validity and reliability of LPE. Live-patient clinical licensure examinations are generally administered in educational institutions, overseen by regional testing agencies. Current testing is graded on a pass/fail basis and cannot be fully standardized due to the use of individual human subjects and the need for subjective examiner evaluations.[1,5] The patients being treated introduce variability, lessening the consistency and validity of LPE.[1–3,5,33]

A purpose of regional testing agencies was to introduce a third-party examiner to reduce potential bias in favor of the candidate by eliminating instructor evaluations. However, the nature of having multiple testing agencies inherently introduces inconsistencies between grading and evaluation amongst testing agencies, complicating standardization. This has resulted in individual states not accepting outside testing agencies' examination results as valid, further limiting licensure and licensure portability.[7] Other challenges to the validity of LPE include retest statistics demonstrating that virtually every person who retakes the live patient exam passes on the second or third attempt.[27] This demonstrates that LPE do not prevent candidates from obtaining licensure, and implies that there are likely variables other than candidates' skill contributing to initial failure of the exam.[5,27]

Licensure portability. State boards of dentistry and insufficient licensure reciprocity have constrained licensure portability in the U.S. Though regional clinical examinations are often accepted by various states within a geographic region, a federally recognized clinical licensure exam does not exist.

Alternative Credentialing at the State Level

To mitigate concerns surrounding LPE and licensure portability, some state boards of dentistry and testing agencies have developed and currently accept optional alternative means to credentialing dental professionals.[4,23,30] In addition to accepting their own regional testing agency

results, several states, including New York, Delaware, Colorado, Minnesota, and California also credential candidates who have completed a PGY-1. California and Colorado further credential candidates who have completed a clinical portfolio, and Minnesota accepts the Canadian NBDE OSCE.[4,17]

A 2016 survey of ADEA members of the Council of Allied Dental Program Directors (CADPD) reported that 86% of dental hygiene educator respondents supported the use of alternative examinations as pathways for licensure.[22] The development and acceptance of alternative clinical examinations have helped address issues surrounding LPE and licensure portability, yet a federally accepted alternative clinical licensure exam does not exist. Leaving the LPE the most widely accepted and practiced pathway for clinical licensure across states and territories, with regional restrictions largely remaining.

National Licensure Reform

To address the concerns surrounding LPE and licensure portability, the ADA and ADEA formed the Task Force on Assessment of Readiness for Practice (TARP). In 2017, TARP issued a report recommending further development and pilot testing of alternative clinical licensure examinations. The American Student Dental Association (ASDA) then joined the Task force, forming the Coalition Reform for Licensure, which went on to call for the abolishment of LPE further calling for the acceptance of a federally recognized Dental Licensure Objective Structured Clinical Examination (DLOSCE) as a valid replacement.

Dental Licensure OSCE. Currently, OSCEs are used as licensure pathways for the U.S. Medical Licensing Examinations, the Medical Council of Canada Qualifying Examination, and the NDBE Canada OSCE used for dental licensure in Canada.[16,18,19,34] Due to the proven reliability of the OSCE licensure examination in Canada, the ADA Board of Trustees voted to

adopt the Dental Licensure Objective Structured Clinical Examination (DLOSCE) further calling for a federally recognized clinical licensure examination.

During the 2018 American Dental Hygienists' Association (ADHA) House of Delegates annual meeting, the ADHA voted to support the elimination of LPE and to join the Coalition for Dental Licensure reform.[35] However, currently it remains to be seen if and when a similar licensure change may affect dental hygiene licensure. A pilot of the DLOSCE is scheduled to take place late 2019, and it is planned to replace LPE by August 2020.[20]

2.4 The OSCE

Since its inception in the 1970's, the OSCE has been universally recognized as a gold standard for the evaluation of clinical performance in a simulated environment.[36] [37] OSCEs are used as assessment tools in education as well as licensure examinations. The purpose of an OSCE is to assess performance, based on the principles of objectivity and standardization.[37] To obtain objectivity, the exam uses calibrated examiners and standardized grading parameters such as rubrics and checklists. OSCEs are designed to test specific clinical tasks that align with the competencies a curriculum needs to assess.

An OSCE is a station-based examination that requires an individual to perform clinical tasks while demonstrating higher-order thought processes.[10] Stations are timed and require a student to successfully complete one or more problem-solving tasks before moving on to the next station. Each station requires the application of different skills while challenging different thought processes.[16] OSCEs require various levels of supervision and examiner involvement.[16]

OSCE Development

Developing an OSCE requires a deep appreciation of the underlying educational principals needed to be evaluated. It further requires the appropriate use of resources to measure

the desired outcome adequately. This is because OSCEs are not reflective of whether a student knows something, but rather that they know how to perform something.[37,38] For this reason, performance is often assessed with standardized patients, computer simulations, or hands-on demonstrations.

OSCEs are resource intensive compared to other assessment tools, making feasibility a practical consideration. Time constraints and lack of resources are common barriers reported in literature.[39–41] Though labor intensive, studies show that educators do feel OSCEs are valid and reliable tools to assess the clinical performance of their students.[12,13,22,39,42]

OSCE in Dental Education

Dental education requires the compilation of didactic and clinical education to produce the level of knowledge needed to practice. Truly assessing students' knowledge is often challenging for educators. For this reason, OSCEs have been a common practice among dental schools in the U.S. for decades.[14,15] In dental curricula, OSCEs assess various skill sets including communications, patient education, clinical skills, readiness to transition from preclinical to clinical care, and critical thinking.[14,16,43–45] A retrospective OSCE study by Graham, et al., assessed the clinical preparedness of students entering their first year of dental education. The study found moderately-high correlations between performances on the OSCE and performances assessed later that year.[42] This suggests that OSCEs are a reliable method to predict future student performances, allowing for programs to modify curricula as areas of weakness or confusion are identified through their use.[14,16]

Though the use of OSCEs are widely recognized in dental education, gaps in the literature exists regarding current utilization trends of OSCE's in dental hygiene education in the U.S. However, a 2009 study by Navickis, et al., surveyed dental hygiene program directors to

explore the use of various standardized clinical examinations in dental hygiene curricula. The study reported that 59% of dental hygiene programs utilize OSCEs. Thirty-seven percent reported time as a barrier for OSCE utilization, yet 46% reported OSCEs as an effective tool to verify the clinical performance in dental hygiene students.[39]

2.4 Summary

While OSCE utilization has been widely recognized in dental schools, there is a significant gap in literature specifically regarding the use of OSCE in dental hygiene programs. Additionally, little is known about any future impact that dental licensure changes may have on dental hygiene licensure examinations. Therefore, the purpose of this study was to assess Dental Hygiene program directors' (a) current utilization of OSCEs in dental hygiene program curricula (b) perceived barriers of OSCE utilization (c) attitudes and awareness of the developing DLOSCE for licensure.

Chapter 3

Materials and Methods

3.1 Study Population and Design

This research study surveyed a convenience sample of 332 dental hygiene program directors across the U.S. A nine-question, electronic survey was developed using Qualtrics, and analyzed by the University's Survey Research Center for content validity and reliability. Survey questions explored demographic information including years as program director, and highest degree offered at the respective institution, questions related to OSCE utilization and awareness of the developing DLOSCE. Five-point Likert-scale questions assessed the perceptions of program directors regarding support of replacing live patient board examinations with an OSCE for licensure, and their perception of the validity and reliability of OSCE to assess the clinical competence of dental hygiene students. The survey was pilot tested by five dental hygiene program directors across three-dental hygiene programs. Modifications to the survey were made based on feedback.

3.2 Recruitment and Procedure

The study investigator obtained a list of U.S. dental hygiene program directors' email addresses from the American Dental Hygienists' Association (ADHA) Entry-Level Dental Hygiene Program Directory. A recruitment email introducing the purpose of the study and informed consent (appendix B) was sent containing a link to the study. The survey was open to participants for eight weeks, with three reminder notifications emailed every two weeks.

3.3 Data Analysis

Data were collected and analyzed in Qualtrics Survey Software and SPSS (Version 25, IBM Corp. Released 2017) for further analysis. Descriptive statistics such as frequency distributions, percentages, and standard deviations were calculated to provide a summary of the findings. Inferential statistics such as ANOVA and Independent T-Tests were sought to provide inferences about the sample population. Significance was set at ($p<0.05$.)

3.4 Protection of Human Subjects

The study was submitted to the University of Michigan Institutional Review Board (IRB) for approval and was determined exempt from IRB oversight. (HUM00147564). There was no risk to participants and no consequence for not participating.

3.5 Consultants/Collaborators

Iwonka Eagle, RDH, MS, Clinical Assistant Professor, Samantha Mishler, RDH, MS, Adjunct Clinical Lecturer, and Nolan Kavanaugh, MPH, Adjunct Lecturer, for the Department of Periodontics and Oral Medicine at the University of Michigan School of Dentistry, agreed to be a consultant in this study.

Chapter 4

Results

4.1 Participation and Demographics

Three-hundred thirty-two subjects were recruited, 129 chose to participate, and 121 competed the survey, for a response rate of 36%. Demographic information was reported in (Table 1). The majority of respondents (60%) served as a dental hygiene program director for ten years or less and the majority (53%) reported the highest dental hygiene degree offered at their learning institution as an Associate Degree.

4.2 Analysis of OSCE Utilization in U.S. Dental Hygiene Programs

An aim of this study was to evaluate whether dental hygiene program directors utilize OSCEs in their program curricula to assess the clinical performance of their students. The results showed that nearly half of program directors 49% (n=59) reported incorporating OSCEs in program curricula (Table 2). When comparing degree level to OSCE utilization, master's degree programs reported the highest percentage of utilization 65% (n=17) compared to bachelor's 48% (n=14) and associate programs 43% (n=28).

Figure 2 illustrates how and/or when OSCEs are used to assess clinical performance in dental hygiene curricula. Of the respondents who indicated utilizing OSCEs, 20% reported use in pre-clinic and 18% reported in clinic to assess competencies, test cases, and proficiencies. Only 6% program directors reported using the OSCE as a requirement for graduation.

4.3 Analysis of Reported Barriers of OSCE Utilization by Program Directors

Of the total respondents, 51% (n=61) reported that they do not currently utilize OSCEs in their dental hygiene curricula. These respondents were then asked to identify the barriers that best supported why their programs do not utilize OSCEs and to select all that applied. Time (22%), evidence-based development processes (21%), and resources (18%) were most frequently reported, while 9% reported that they were unfamiliar with OSCEs (Figure 3).

4.4 Analysis of Program Directors' Awareness of and Attitude toward the DLOSCE

The final aim of this study was to assess dental hygiene program directors' awareness of the DLOSCE and their attitudes toward such a change. Nearly a third of program directors were unaware of the developing DLOSCE (figure 4), however 80% were in favor of the change (Figure 5). Furthermore, 72% of respondents reported OSCE as reliable and valid methods for evaluating clinical performance of dental hygiene students (Figure 5).

OSCE Utilization and Attitudes toward OSCEs Three independent samples t-tests were conducted to compare mean ratings of attitudes regarding favorability, validity, and reliability between program directors who utilized OSCEs and those who did not (Table 3). In regards to favorability, there was not a significant difference between the average ratings of dental hygiene program directors who utilize OSCEs (M= 4.357, SD= 0.724) and those who did not use OSCEs ((M= 4.066, SD= 1.289); t(95.974)= 1.524, p= 0.131). However, in regard to beliefs that OSCEs are valid assessment measures. Program directors who utilized OSCEs reported significantly higher ratings (M= 4.298, SD= 0.844) than program directors who did not use OSCEs ((M= 3.754, SD= 1.233); t(106.552)= 2.815, p= 0.006). Finally, in regards beliefs that OSCEs are a reliable assessment measure, program directors who utilized OSCEs had

significantly higher ratings (M= 4.245, SD= 0.851) than directors who did not use OSCEs ((M=3.737, SD= 1.263); t(105.704)=2.576, p= 0.011). Significance was set at (p= 0.05).

OSCE Favorability, Years as Program Director, and Degrees Offered Two ANOVA tests were conducted to compare if the number of years as program director or the highest dental hygiene degree offered at an institution effected favorability of replacing LPE with an OSCE. No significant difference between the average favorability rating among program directors based on ranges of years of service were observed (f (5,12) =0.336, p=0.890). There was also no significant difference between the average favorability rating based on highest degrees offered at an institution (f (2,115) = 0.489, p=0.614) were observed.

Chapter 5

Discussion

5.1 Summary

OSCEs have been a trusted tool to assess the clinical performance of dental students for decades.[14] In light of recent clinical licensure changes for dentistry and due to significant gaps in the literature regarding OSCE utilization in dental hygiene programs, the overarching goal of this thesis research project was to twofold, (a) to obtain primary data from dental hygiene program directors regarding the current utilization and perceived barriers of OSCEs in dental hygiene programs across the U.S., (b) to obtain feedback regarding program director's awareness of and attitudes toward the elimination of the long-standing single-encounter patient-based dental licensure exam and the subsequent DLOSCE.

In this study, nearly half (49%) of program directors reported utilizing OSCEs in their program which is considerably less than the Navicki's 2009 national study which reported 59% of program directors used of OSCEs in their dental hygiene curricula.[39] Though this study cannot confirm a decrease in OSCE utilization nationally, there does not seem to be a positive trend in the growth of OSCE utilization over the past decade.

This study further reported time constraints and lack of resources as significant barriers to implementing OSCEs into dental hygiene curricula. In a similar national study that explored pharmacy schools' utilization and attitudes toward OSCEs, time and faculty work-load were listed as the most significant barriers reported.[40] The author further elaborated that pharmacy educators recognized the value of time as it relates to the proper development of OSCEs,

however, workloads do not permit the time needed to develop such an assessment. This echo's the time constraint responses reported in this study.

There are decades of evidence in the literature supporting the validity of OSCE assessments as best practices. In fact, between 2011 and 2016, over 400 articles were published.[36] Despite this evidence, more than half of program directors in this study reported not utilizing OSCEs within their curricula, with approximately 9% unsure of what an OSCE is. It would be worthwhile to examine how these program directors obtain information and stay current in regarding trends in dental hygiene education such as the use of OSCE, and alternative clinical competency assessment strategies. Of those not currently utilizing OSCEs, there was concern regarding a lack of best practices in OSCE development. The design of an OSCE is crucial to its success, and the desire for an understanding of best practices is a valid concern.

The results of this survey showed that dental hygiene program directors who currently utilized OSCE assessments in their curricula had a statistically significant belief of OSCE as a valid and reliable means to assess clinical performance in dental hygiene students. This begs further investigation as to why this contradiction exists in the knowledge and understanding of OSCE implementation across DH program directors.

Furthermore, this is of concern considering that OSCEs have been used in dental education for many years and is now becoming the center of a new pathway to licensure in dentistry. Interestingly, even though half respondents do not use OSCEs in their curriculum, 80% are in favor of replacing live patient testing with OSCEs for licensure. These results are reflective of a 2016 survey of ADEA members CADPD that noted that 78% of respondents did not feel LPE adequately indicated clinical competency, with the vast majority (86%) supporting the elimination of the LPE.[22]

The decision to develop the DLOSCE is based on the consistent evidence that OSCEs are the gold standard among clinical assessments for their ability to expose clinical and didactic strengths and weaknesses, in addition to enriching student learning.[46,1,5] This firmly counters the argument that an LPE is the only valid way to determine competency for clinical practice in dentistry. By the same rationale, it begs the question of the validity of how we currently assess student performance in clinical education settings. In clinic, student assessments are dependent on the often-unknown patient presenting and the faculty member performing the assessment which introduces a host of variability and subjectivity across the assessment. Alternatively, OSCE assessments remove the often unpredictable and unreliable variables of standard clinical patient-based graded assessments.[36]

While the OSCE has been firmly established, as a valid, reliable and practical way to assess the clinical performance, it is not the only option.[36] After the Coalition for Licensure Reform disseminated its report, ADEA began the development of a compendium of clinical competency assessments that will determine the competency of graduates from dental education programs.[47] Additionally, ASDA published its *White Paper* calling for the elimination of LPE while providing alternative methods to assess the clinical competence of dental students.[23]

With the implementation of the DLOSCE in 2020, the dental hygiene licensure exam will be the only healthcare licensure examination that requires the use of human beings as test-subjects to assess clinical competence. Fleckner and Rowe's 2015 survey of dental hygiene program directors reported 73% of respondents agreed that variability in live patient examination remained to be a barrier to standardizing state and regional examinations.[31] Furthermore, a majority of directors believed that graduating from a CODA-accredited dental hygiene program and the successful completion of the written national board examination were adequate

requirements to determine clinical competency and readiness to safely serve the public.[31] This earlier finding supports the efforts of ADEA to create a compendium of clinical competency assessments, and presents opportunity for dental hygiene educators to take a lead in shaping how these changes will impact dental hygiene education and licensure.

Licensure change is likely on the horizon for dental hygiene licensure, therefore it is crucial to consider standardizing the use of OSCE assessments in all dental hygiene programs. The development of a dental hygiene OSCE consortium or standardized dental hygiene OSCE guidelines or blueprints would be effective tools to mitigate the barrier of time constraints, development processes and resources that were identified within this study. Implementing OSCEs throughout a students' dental hygiene education can be an effective, valid, and reliable way to not only accurately assess clinical performance but can also serve to dental hygiene education programs for the potential changes to licensure. As the Coalition for Reform in Dental Licensure prepares to lobby state boards of dentistry for dental licensure, dental hygiene educators must actively prepare its programs for similar licensure changes.

5.2 Limitations

This study had a number of limitations. One limitation of the study was survey size which was intentionally done to increase compliance; however, it restricted the breadth of the data collected. Self-reporting was another limitation as it increases the risk for bias responses and may not be representative of all dental hygiene programs. Limitations also existed surrounding the data analysis of dental hygiene directors' perceived barriers of OSCE utilization in dental hygiene curricula. When asked to identify which barriers existed, the option *resources* did not was not explicit, making interpretation of the responses subjective.

5.3 Suggestions for Future Research

Suggestions for future research on this topic would be to explore the potential impact an OSCE-based licensure exam would have on the seemingly unprepared dental hygiene education system, as well as resources available to prepare educators for such a change. Future research should also explore how OSCE awareness was achieved by program directors who knew what an OSCE was. This is worth exploring since currently half of programs nation-wide to not utilize OSCEs leading one to suggest that many program directors must have gained an appreciation for OSCE outside of their own dental hygiene education; perhaps while seeking higher education or at a continuing education course. Lastly, since nearly one-third of dental hygiene program directors were not aware of the elimination of LPE for dental licensure or the subsequent DLOSEC, future studies should explore potential attitudes and barriers that exist between the ADA and leaders of dental hygiene education.

Chapter 6

Conclusion

The use of OSCE is becoming a pathway for dental licensure, subsequently making dental hygiene the *last* healthcare profession to require the use of human test-subjects in clinical licensure examinations in the U.S. This study echoed a 2016 ADEA study which found most dental hygiene program directors favor the elimination of the single-encounter, live-patient examination. However, this study also reiterated an early program directors' study which suggests that nearly half of all dental hygiene programs nationwide do not currently utilize OSCEs in their curricula, suggesting dental hygiene education is ill-equipped to prepare candidates for such a licensure change. For that reason, dental hygiene has a responsibility to begin actively exploring strategies to incorporate OSCEs throughout dental hygiene education. Future studies are warranted to assess best practices of OSCEs in dental hygiene education. Additionally, it is important to assess how the implementation of an OSCE for dental hygiene licensure might impact the current education system and licensure pathway of dental hygienists in the U.S.

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Tables

Table 1

Dental Hygiene Program Directors' Demographics

Demographics (n=121)	
Years as Program Director	**(%)**
1-5	**32%**
6-10	**27%**
11-20	**31%**
21-30	**6%**
31-40	**2%**
40+	**<1%**
Highest Degree at Institution	**(%)**
Associate	**53%**
Bachelor's	**25%**
Master's	**22%**

Table 2

Utilization of OSCE in Dental Hygiene Programs

OSCE Utilization	(n=120)
	(%)
Yes	49%
No	51%

Table 3

Comparison of mean ratings of attitudes between program directors who did and did not utilize OSCEs

Welch's Two-Sample T-Tests: Two-sided p-value						
	Utilization	**N**	**Mean**	**SD**	**t(df)**	**p-value**
Favorability	Yes	56	4.357	0.724	t(95.974)=1.524	p=0.131
	No	61	4.066	1.289		
Validity	Yes	57	4.298	0.844	t(106.552)=2.815	p=0.006**
	No	61	3.754	1.233		
Reliability	Yes	57	4.245	0.851	t(105.704)=2.576	p=0.011*
	No	61	3.737	1.263		

*sig. *p<0.05, **p<0.01*

Figures

Figure 1

Trends of OSCE Utilization

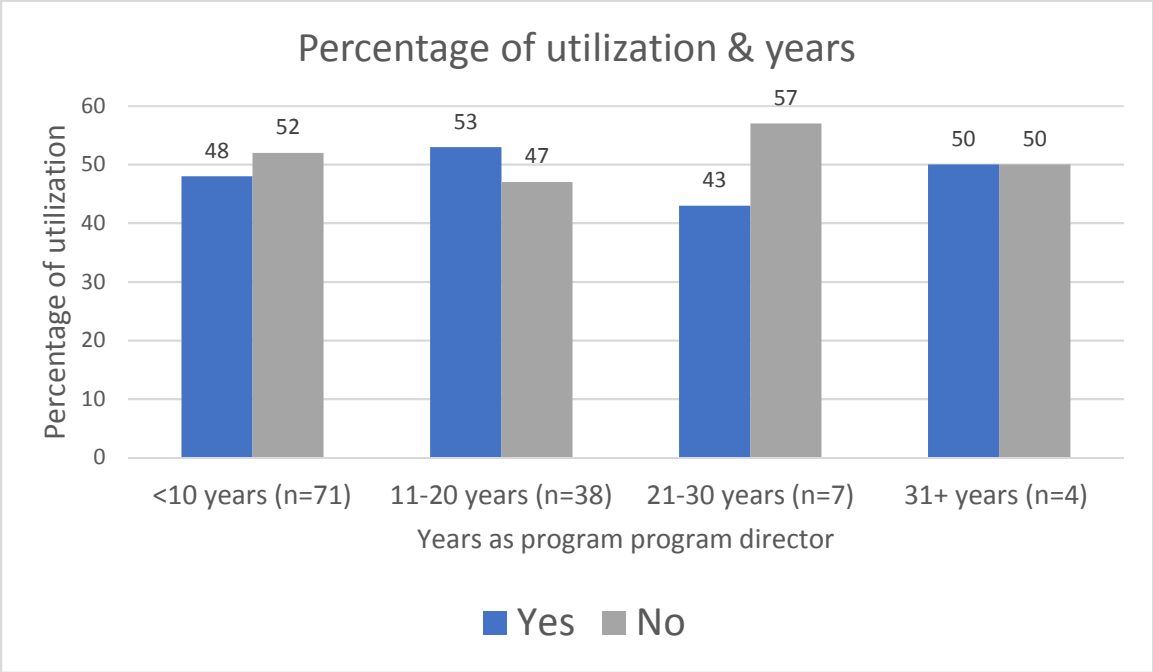


Figure 2

OSCE Utilization

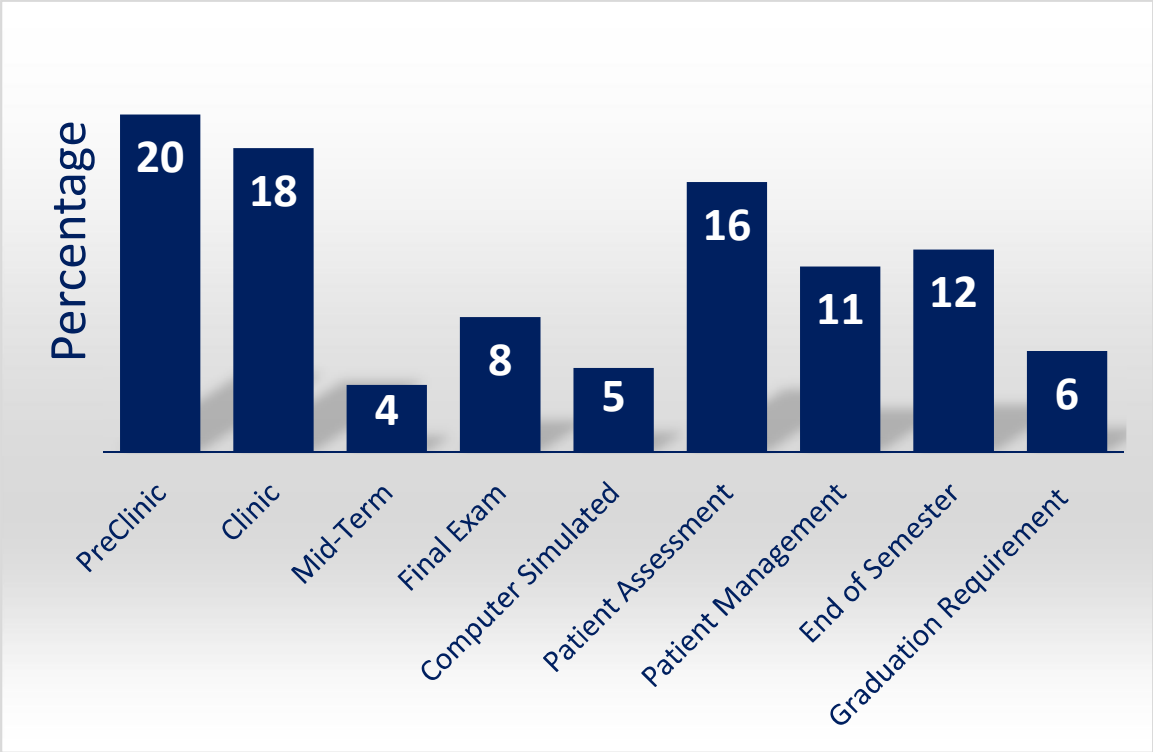


Figure 3

Perceived Barriers

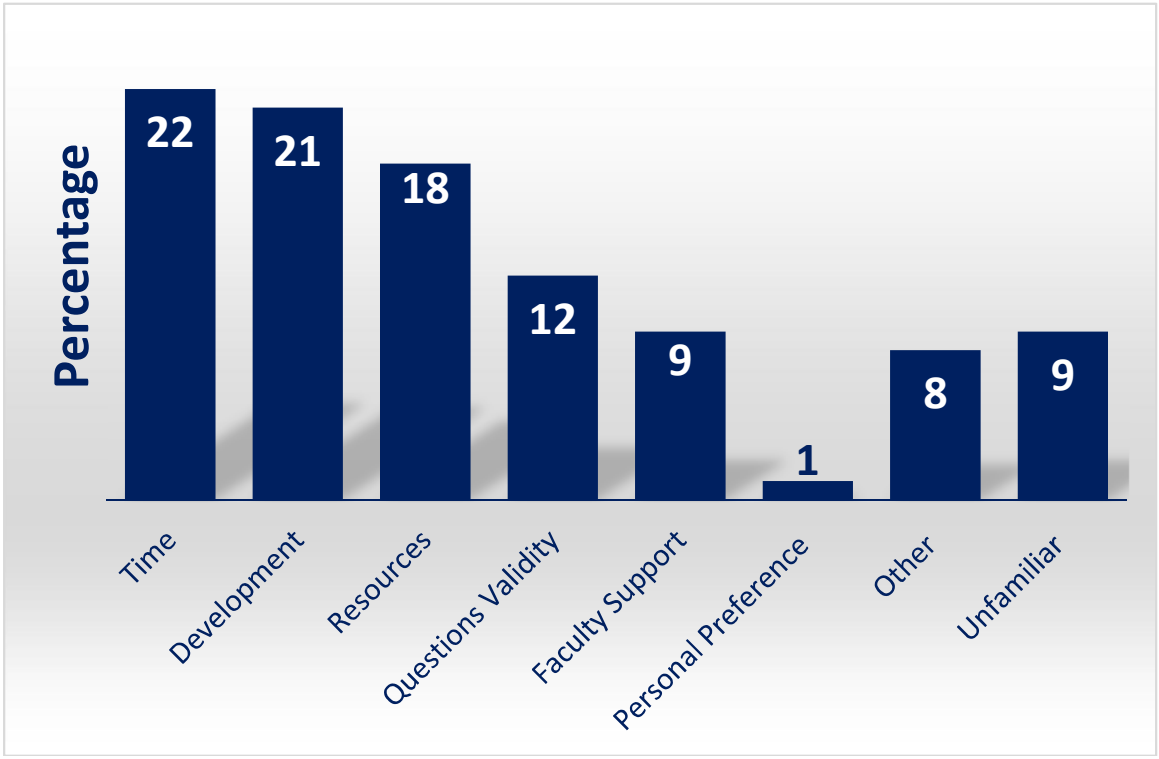


Figure 4

Percentage of DH Program Directors Aware of DLOSCE Development (n=118)

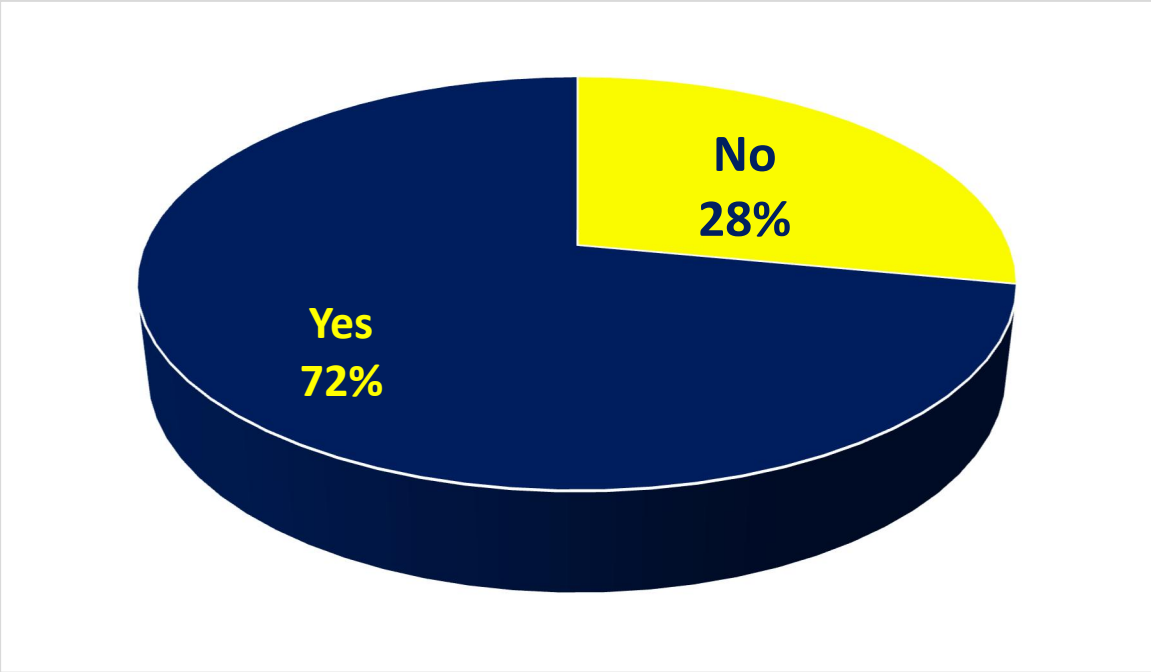
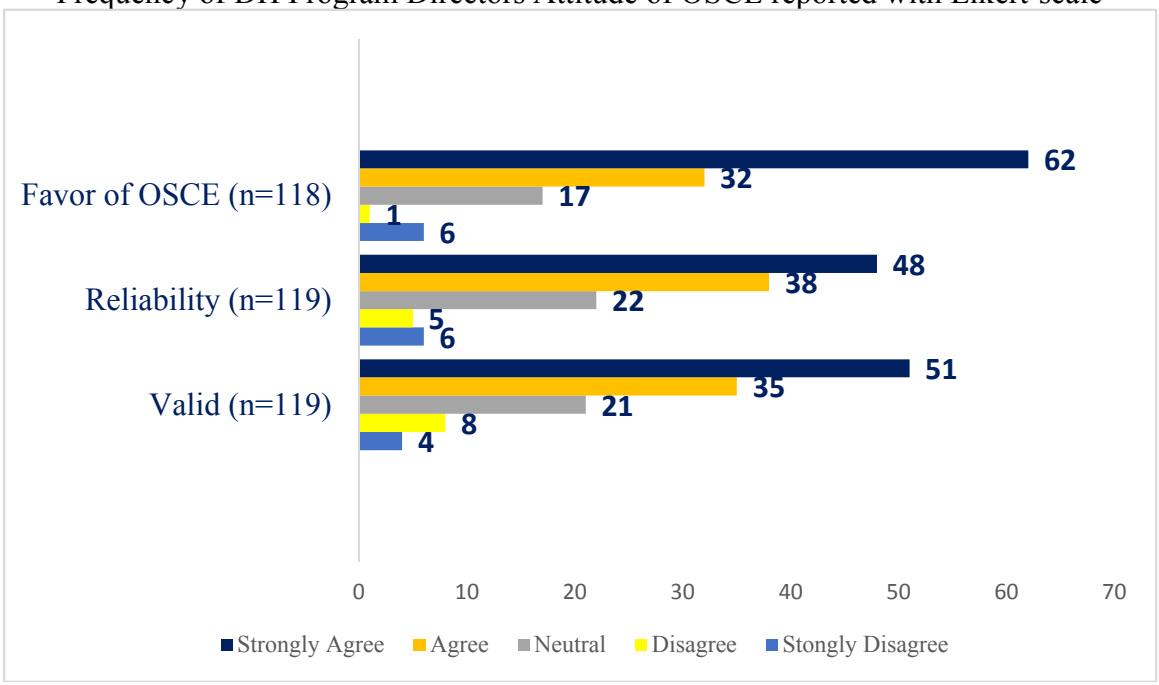


Figure 5

Frequency of DH Program Directors Attitude of OSCE reported with Likert-scale



Appendices

Appendix A
Survey

How many years have you served as a Dental Hygiene Program Director?

- 1-5 years
- 6-10 years
- 11 - 20 years
- 21-30 years
- 31-40 years
- 40 +

What is the highest degree offered in dental hygiene at your institution?

- Associate degree
- Bachelor's degree
- Master's degree

Do you currently incorporate OSCEs within your curriculum?

- Yes
- No

How and/or when are OSCEs used to assess clinical competence in your program? Select all that apply.

- Pre-Clinic
- Clinic (competencies, test cases, proficiencies)
- Mid-Term Exam
- Final Exam
- Computer Simulated
- Patient Assessment (medical history, treatment plan)
- Patient Management (patient concerns, best practice of care)
- End of semester clinical competency
- As a requirement for graduation

Which of these reasons best supports why your program does not currently incorporate OSCEs within the curriculum? Select all that apply.

- Unsure what an OSCE is

- [ ] Unsure how to best develop an OSCE
- [ ] Unsure of the validity of an OSCE
- [ ] Lack of faculty support
- [ ] Personal preference
- [ ] Time
- [ ] Resources
- [ ] Other

Are you aware of the partnership between the ADA and ADEA to develop an OSCE to replace live patient board examinations for licensure?

- ○ Yes
- ○ No

Please indicate how strongly do you agree or disagree with each of the following statements?

	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
I am in favor of replacing live patient testing with OSCE's for licensure.	○	○	○	○	○
I feel OSCE's are a valid method for assessing clinical competence in dental hygiene students.	○	○	○	○	○
I feel OSCE's are a reliable mean of measuring clinical competence in dental hygiene students.	○	○	○	○	○

What additional comments do you have regarding the use of OSCE's in dental hygiene curricula or for licensure?

We thank you for your time spent taking this survey.

Your response has been recorded.

Appendix B
Informed Consent

In a joint effort to replace patient-based licensure exams, Objective Structured Clinical Examinations (OSCEs) are being explored as an option for dental licensure by the American Dental Association and the American Dental Education Association.

The objective of this study is to gain an understanding of dental hygiene program directors' experience and perceptions of utilization of OSCEs within their curricula. You will be presented with information relevant to OSCEs and asked to answer questions about it. Please be assured that your responses will be kept completely confidential.

This survey has been deemed exempt from oversight by the University of Michigan IRB (HUM00148962). The survey should take you approximately five minutes to complete. Your participation in this research is voluntary. You have the right to withdraw at any point during the study, for any reason, and without any prejudice. Please complete the survey by **Tuesday, July 31, 2018.** If you would like to contact the Principal Investigator in the study to discuss this research, please e-mail Dr. Danielle Furgeson at furgeson@umich.edu.

By clicking the button below, you acknowledge that your participation in the study is voluntary, you must be a legal adult in the state where you live, and that you are aware that you may choose to terminate your participation in the study at any time and for any reason.

Please note that this survey will be best displayed on a laptop or desktop computer. Some features may be less compatible for use on a mobile device.