

Factors Associated with Clinical Skill Remediation in Dental Hygiene Education Programs

Donna F. Wood, RDH, MS; Tanya Villalpando Mitchell, RDH, MS; Lorie A. Holt, RDH, MS; Bonnie G. Branson, RDH, PhD

Introduction

Assessment of clinical skills in health care professions education is vital to the development of competent clinicians. Students who fail to demonstrate adequate progress often require additional student instruction in a clinical environment. Evaluation of students in a clinical environment can be difficult for a variety of reasons including faculty calibration, patient conditions and institutional guidelines. Early identification of skill deficits is critical in order for remediation to begin early in the educational process before deficiencies become complex.¹

Health care professional programs adhere to rigorous policies relating to progression through the curricula because many skills build upon one another.²⁻⁴ Dental hygiene programs must follow standards for student skill progression as set by the Commission on Dental Accreditation (CODA). These standards are in place to ensure the quality and continuous improvement of dental-related education while reflecting the evolving practice of dentistry.⁵ The standards offer a rule or basis of comparison established in measuring or judging capacity, quantity, quality, content and value of a program.⁵ CODA's standards consist of many competencies which are written statements describing the level of knowledge, skills and values expected by program graduates.^{5,6} Competency-based education employs a unique component in that it measures a learner's ability to perform professional tasks similar to real-life work situations. It measures student performance against a standard as defined by written competencies.²

Completion of these professional

Abstract

Purpose: The purpose of this study was to examine the challenges related to formal clinical remediation in dental hygiene programs, which include timing of student identification, policy development, and the issues of methodology and scheduling.

Methods: A 23 item investigator-designed survey was electronically distributed to all 303 U.S. entry-level dental hygiene program directors. This questionnaire included 23 forced-choice questions with the options to add comments to 8 of the questions. A total of 111 surveys were returned yielding a response rate of 36%. Descriptive statistics and Chi-square analyses were utilized to analyze relationships between responses and the degree earned from the dental hygiene program.

Results: All schools reported having a remediation policy; however, 13.6% of the respondents revealed this information was not readily available to students. The majority of respondents (67.8%) reported identifying students with clinical deficiencies in the pre-clinical semester, and 15.5% identified students in the second year, second clinical semester. Instrumentation technique was identified as the area in greatest need of remediation (81%), followed by critical thinking and problem solving skills (12%). Coordination of faculty and student schedules to conduct remediation was identified as one of the greatest challenges by respondents (25.2%). Results of this study suggest that challenges exist with the process of remediation. Some of these challenges include involving the student in remedial plan development, the academic consequences associated with remediation and scheduling time and space for remedial activities.

Conclusion: These findings indicate that respondents are well aware of the need for remediation policies in dental hygiene programs. The point in time varies when students in need of remediation are identified. Therefore, further research needs to be conducted to determine the reasons for this difference. Some reasons may include inability to grasp the foundational skills and/or the complexity of advanced instrumentation in the second year. Also, it is suggested that investigation regarding methods used to address the challenge of faculty and student scheduling for remediation sessions would be useful.

Keywords: dental hygiene, remediation policies, faculty overload, clinical skills evaluation, faculty shortages

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tasks is dependent upon clinical skill acquisition. In dental hygiene this involves dexterity, tactile and visual components. Clinical skill acquisition is one of the most complex aspects of dental hygiene education.³ Learning the basic clinical skills begins early in a program and continues at an accelerating pace throughout the curriculum. Skill development is competency-based and occurs in conjunction with didactic learning critical for the dental profession.

When a student is unable to demonstrate adequate skill development to move to the next level, either academically or clinically, remediation often becomes necessary. Standard 2-2 of the American Dental Association (ADA) CODA standards for Dental Hygiene Education Programs states that "Academic standards and institutional due process policies must be followed for remediation or dismissal."⁵ Although this appears very simplistic in nature, the actual process can entail multiple components and can be quite complicated. There are multiple factors surrounding the clinical remediation process including student identification, remediation plan development, and communication, implementation of the remediation plan and teaching methodologies to employ.

Recognizing and Communicating the Need for Clinical Skills Remediation

Szumacher et al reported that students in a medical radiation science program who are having difficulty either with the didactic or clinical component of their training are usually identified after the curriculum is well under way.⁷ This can cause the remediation process to not only be more time intensive, but can also put the student at risk for not completing the program in a timely manner. Early identification of student's academic or clinical deficits may help increase the probability of student success in their dental hygiene program, and is important since each new skill builds on a previously learned skill. In a study by Holt, students listed academic and clinical difficulties as a primary reason for leaving a dental hygiene program, creating a need to explore the remediation process in dental hygiene programs.⁸

A study of clinical remediation in dental hygiene education by Branson et al asked dental hygiene program directors in the U.S. to define procedures utilized for clinical skill identification, evaluation of the instructor/student communication process, and implementation and outcome of student remediation plans.⁹ Only 54% of the 181 respondents reported having any type of written policy on clinical remediation. Branson et al's study focused only on policy and methodology and not on the specifics of remediation plan development. However, the authors recommended that written plans be developed. Other authors have also rec-

ommended the development of written remediation plans and that these be developed by the academic advisor, focusing on strategies and criteria specific to the student's learning needs.³ Defined goals and objectives, a realistic time frame, and how remediation will be addressed, evaluated and documented are important parts of the remediation process and should be included in a student remediation contract.^{3,9} Establishment of a positive and supportive learning environment, clearly understood clinical learning objectives by the faculty and the student, evaluation based on multiple sources of evidence, timely and relevant feedback in direct correlation with the learning objectives, and a fair clinical evaluation process to all concerned are suggested components in the course of action.⁴ The remediation contract should also include the student's reflection on the area of his performance not meeting clinical competency, and the student's plans to enhance and improve his future performance.³

Instructional Methods for Clinical Remediation

An earlier study found instructional methods used in clinical remediation processes varied among individual dental hygiene programs.⁹ Dental hygiene program directors reported the most common remediation methods were the same as those employed in basic clinical skills instruction: skill acquisition using typodonts, one-on-one faculty instruction and additional supervised clinical practice time.⁹ Other methods of remediation include the faculty serving as a patient, peer tutoring, videotaping and occasionally dental office observation.⁹ All of these methods can prove to be very challenging, due to the lack of available clinic times as well as the limited availability of both the student and the instructor.

Dental Hygiene Faculty and Clinical Remediation

All of the instructional methods described above involve a certain amount of faculty participation. This participation can add to the faculty workload and is often a barrier in conducting successful remediation plans.^{3,10} Remediation must be supported and guided by the faculty who are able to assume responsibility for clinical skill remediation instruction.^{4,11,12} This is often difficult due to faculty/student ratios. Accreditation standards outline student instructional time in clinics and laboratory sessions, as well as faculty to student ratios for these sessions. For dental hygiene educational programs and faculty, implementing these standards results in heavy clinical teaching loads and contact hours in all dental hygiene degree programs.¹³

Faculty shortages often lead to barriers in supplying the proper student/faculty ratios. Collins et al rec-

ports that the inequity between salaries in education as compared to private practice has an effect on the number of dental hygienists applying for teaching positions.¹³ Dental hygiene faculty must possess a baccalaureate or higher degree in order to provide didactic instruction in a dental hygiene program.⁵ The number of baccalaureate programs is much smaller in number than the associate level programs, leading to a lower percentage of graduates who not only pursue, but are qualified to enter the educational professions.^{10,12}

The Need for Updated Research on Dental Hygiene Clinical Skills Remediation

The Branson et al study examined remediation in dental hygiene programs, by exploring the clinical skills evaluation procedure, instructor/student communication process, and implementation and outcome of student remediation.⁹ Freudenthal and Bowen focused on some of the policies and appeals processes for clinical remediation and found that early identification of the clinical skill deficit, a student-centered approach, learning contracts and faculty monitored remediation all contributed to high student retention rates and successful student outcomes.³ However, Holt studied retention practices in associate degree programs and reported that associate degree, entry-level dental hygiene programs are committed to student retention.^{6,8}

While literature on remediation issues in allied health programs is vast, the literature on dental hygiene remediation in educational programs is limited.^{3,9,14-18} Limitations and gaps in exploring the topic of remediation in clinical dental hygiene education exist. These limitations include a lack of clarity in policies revolving around remediation and how these policies are communicated to the students, a lack of clarity in all types of instructional methodologies used to remediate students and an incomplete investigation of the barriers surrounding dental hygiene student remediation. Therefore, the purpose of this study was to examine the issues related to formal clinical remediation in dental hygiene programs. This study incorporated topics from previous works, and new questions were added to a survey previously distributed by Branson et al in 1995 that addressed the above mentioned limitations in the literature of clinical remediation.^{3,9}

Methods and Materials

A survey developed by Branson et al on issues related to clinical skill remediation in dental hygiene education was modified for this study and distributed in an electronic format to 305 dental hygiene program directors in the U.S.⁹ The questionnaire consisted of 23 questions and included topics relating to the need, timing, process, design and implementation of clinical remediation. In addition, general demographic infor-

mation was sought. While 18 of the questions were forced-choice for ease of data analysis, participants were given the opportunity to provide additional information in the 5 remaining questions. The survey was delivered via email to the addresses of the 305 dental hygiene program directors which were provided by the American Dental Hygienists' Association (ADHA). Included were instructions for the program director to forward the survey to the faculty person most closely associated with clinical skill remediation.

Following the University of Missouri Social Sciences Institutional Review Board approval, the survey was pilot tested for review of content and face validity. This quasi-random pilot study selected programs from 5 different geographical regions in the U.S. prior to distribution. The different regions included the northwest, southwest, northeast, southeast and the central plain states. One associate degree program and one baccalaureate program was selected from each region to complete the pilot study. Seven programs participated in completing the pilot test. After reviewing the piloted results, the survey was revised for clarity and specificity.

The survey was delivered using Constant Contact, a public survey and marketing platform.¹⁹ All participants received the survey on the same day and in approximately the same time frame. Survey responses were delivered back to the researcher via an Excel file created by the survey and marketing platform. Responses were anonymous to the researcher.

Non-responders were identified by the marketing platform 2 weeks after the initial survey was distributed, and contacted by the researcher in order to secure a higher response rate. The survey and marketing platform is automatically designed to contact non-responders, limiting the primary investigator's knowledge of those dental hygiene programs that did not reply within the first 2 weeks of launching the survey. All data were provided to the primary investigator in aggregate form to ensure anonymity.

Data were analyzed using descriptive statistics. A Chi-square analysis was conducted on 3 questions to determine if a relationship existed between the type of remediation policy offered, the greatest remediation challenge and method of faculty compensation in data from dental hygiene programs at the associate level versus the baccalaureate level.

Results

An overall response rate of 36% (n=111) was obtained. The degrees awarded at these institutions included Certificates, Associate of Applied Science, Associate of Science or Bachelor of Science. Com-

Table I: Availability of Written Policies for Formal Remediation (n=111)

Student/college handbook	32.7%
Course syllabi	54.5%
Clinic manual	50.9%
Other course material	13.6%
Not available to students	13.6%

*Sum is greater than 100% due to multiple answers allowed

munity colleges represented 52.7% of the responses, 20% were university based (however, not in a dental school), 14.5% were from vocational and technical institutes, 8.1% were located in schools of dentistry, and 6.3% represented proprietary schools. A total of 63% listed a 5:1 student/faculty ratio in their pre-clinic setting. This ratio was consistent with accreditation guidelines and varied no more than 2% in all of the clinical settings during the entire program. The questionnaire sought the dental hygiene program's overall use and implementation of remediation plans - specifically whether they had formal plans in place should the need for remediation arise. The survey also investigated the most common time for a student to be identified as needing remediation, how plans are presented to the student, what instructional methods are used in remediation, how faculty are compensated for the "extra" time needed to implement remediation and overall challenges involving clinical remediation.

Presence of plans: Respondents revealed that 54.5% of programs had written policies for formal clinical remediation available to students in the course syllabi, with 13.6% reporting this information as unavailable to students (Table I). A total of 94% reported policies and procedures informing students how to participate in an academic appeals process made available in the student/college handbook, while only 1.8% did not include any of this content in their course materials (Table II). Since many of the responses regarding the location of the written remediation program policies were left unanswered (47%), perhaps the respondents were unsure as to where the policies were actually located. Lack of familiarity with policies presents an important difficulty in clinical remediation.

Identification of Need for Remediation: The pre-clinical semester in the curriculum was where the majority of respondents reported identifying the student in need of remediation (67.8%). Following closely behind at 62% was the first year clinical semester, while 59% indicated that the need for remediation was not identified until the second year.

Utilizing poor performance on clinical skills assessment was reported by 97%, while 96% utilized faculty observation to determine the need for formal clinical

Table II: Location of Policies for Academic Appeal (n=111)

Student/college handbook	94.5%
Course syllabi	21.6%
Clinic manual	25.2%
Not included in course materials	1.8%
Not included in school materials	0%

*Sum is greater than 100% due to multiple answers allowed

remediation. Faculty meetings and conversations as guided measures of determining a clinical deficiency were used by 73%, while 56.7% utilized a review of daily evaluations. Many respondents commented on using a combination of several of these methods in determining the need for clinical remediation.

Presentation of Remediation Plan: The need for clinical skill remediation is most often communicated to the student by both written and verbal notice, according to 85.5% of the respondents. Communication with the student using only verbal notice was not as popular (11.7%), and the least popular method was written notice (less than 1%). Almost 57% of respondents reported remediation exercises to begin within the same week of the initial identification. Almost 20% reported initiating the remediation process immediately upon identification. Formal remediation plans or contracts with students occurred in 62% of the represented institutions, while 27% reported sometimes and 11% reported none.

In 43% of the programs who do prepare a remediation plan or contract, the clinical coordinator both writes and presents the contract to the student. In the remainder of the programs who do prepare a written plan, 23% are prepared by the program director and the other 23% are prepared by a full time clinical instructor.

Instructional Methods: Clinical remediation for instrumentation skills seemed to be the most common need for students (80%). Other less common themes were critical thinking and problem-solving skills (11%), and respondents did not heavily indicate that these were the primary causes for lack of student progress. A variety of instructional methods were utilized when performing the clinical remediation, with the most common method being one-on-one faculty instruction. Typodont practice in a laboratory setting was utilized by 88%, and approximately 71% gave additional clinic time under one-on-one supervision to their students. A clinical faculty member was identified in 62.9% of the programs as the person responsible for performing the clinical remediation (Table III).

Compensation for Faculty: Of the involved faculty

Table III: Person Responsible for Performing Clinical Remediation (n=111)

Clinical faculty member	62.9%
Clinical coordinator	26.8%
Dental hygiene program director	7.4%
Person most closely working with the student at that particular time	28.7%

*Sum is greater than 100% due to multiple answers allowed

members, 69% were uncompensated for remediating the students, while 18.9% were compensated and 10% were given release time from other program responsibilities. Overall, 35% reported having to exceed their contract hours in order to fulfill these academic obligations (Table IV). Other respondents reported that remediation was considered part of their contract responsibilities, was to be planned during faculty office hours or sometimes allocated to part-time clinical instructors.

Challenges: Two factors were reported as posing the greatest challenge in regards to clinical skill remediation. A total of 25% reported the necessity of identifying the student's deficiency in a timely fashion as a challenging issue, and the same number reported faculty availability to facilitate the remediation as being an issue. Selecting the most beneficial instructional tool to facilitate remediation was reported as the greatest challenge by 17% (Table V).

Three questions were analyzed using Chi-square to determine if a relationship existed between the type of degree awarded and the response given. There was no statistical relationship between the type of degree awarded and the location of written policy, greatest remediation challenge and method of faculty compensation.

Discussion

Remediation is a necessary function within dental hygiene clinical education. Factors associated with this process can hinder or facilitate a student's progress and overall success in a program if remediation is needed. Per accreditation standards, dental hygiene programs must ensure mechanisms are available for students who require remediation. This study sought to examine the various methods schools use to address this need, realizing there were multiple challenges associated with remediation. Results indicate there are multiple factors which can affect the presence, preparation and presentation of remediation policies in entry-level dental hygiene programs, including timing of the identification of the deficiency and methods utilized to remediate the student, as well as the barriers associated with the educational process.

Table IV: How Faculty Members Accommodate Extra Remediation Responsibilities (n=111)

Exceed contract hours	35.1%
Released from other contract responsibilities	20.7%
Additional faculty hired	5.4%
Interaction with non-faculty professionals, i.e. private practice observation	0%
Other	36%
No responses	2.7%

Table V: Factor Which Poses Greatest Remediation Challenge (n=111)

Identification of remediation need in a timely fashion	25.2%
Notifying the student of the need for clinical remediation	0%
Preparing student plan or contract	5.4%
Selection of the most beneficial instructional methods	17.1%
Student availability	8.1%
Faculty availability	25.2%
Faculty compensation	7.2%
Lack of clinic access	9.9%
No responses	1.8%

Presence, Preparation and Presentation of the Remediation Policies

Since only 62.1% of the program respondents reported having a definite remediation plan or contract prepared and presented to the student, this may be a factor in the communication process involved in the notification. Of that number, 57.6% reported incorporating any of the student's input in the plan or contract. Acquisition of a dental skill is facilitated when students know the criteria that define the acceptable product and performance, and when students and faculty can actively and precisely evaluate product and performance.⁸ Incorporation of the student's thoughts would not only help to create an awareness of the need, but also the essential criteria for a successful solution. Of the 43% of programs who do prepare a remediation plan or contract, the clinical coordinator both writes and presents the contract to the student. In the remainder of the programs who do prepare a written plan, 23% are prepared by the program director and the other 23% are prepared by a full time clinical instructor. In these cases, the presentation to the student can occur by the clinical faculty member or the program director.

Notification, Timing and Identification of the Clinical Deficiency

As the Branson et al study found, 98% of faculty members communicated with each other at some time during the program regarding the need for clinical skill remediation, however, it was stated that student notification was not always top priority.⁹ This study revealed that, while slightly over half of the programs were identifying and notifying students of their clinical deficiencies in the first or second semester of their first year, the remainder were being identified during their second clinical year. This presents a problem, as many clinical instrumentation skills are built one upon another. Late student identification and notification can put a student at risk, adding to the development of incorrect habits coupled with the possibility of a graduation delay. Since advanced instrumentation skills are introduced during the second year of the program, it is possible that some students may acquire instrumentation deficits during the same year as the anticipated graduation. However, if proper habits were attained initially, these instrumentation weaknesses should not be difficult to correct. Extreme cases of student failure to successfully remediate have resulted in dismissal from the program. Methods utilized to determine the deficit were faculty observations in clinical performance, poor performance on clinical skills assessment, review of daily evaluations and faculty meetings and conversations. Since these measures are all part of the clinical process, other barriers become factors intertwined with the clarity of this process, thus resulting in further possible delay of the student's progression in the clinical process.

Instructional Methods Utilized in the Remediation Process

The instructional methods utilized today in the student remediation process are the same as in the Branson study.⁹ The most common form of instruction is working one-on-one with a dental hygiene faculty member, due to the complex nature of clinical skills acquisition.² This can occur either in a laboratory or clinical setting. The second most common instructional method used involves typodont practice in a laboratory setting. The third most popular type of instructional method used is extra clinic time under one-on-one faculty supervision. Various other methods were utilized in a small number of cases. These all have a common thread in that they require the undivided attention of an instructor and/or additional student clinic time and availability. This instructor participation can add to the faculty workload which is often a barrier in conducting successful remediation plans.²

Barriers with the Remediation Process

The greatest challenges associated with the remediation process according to the survey respondents were identifying the student's need in a timely fashion and having the faculty availability to meet the remediation needs of that student. Other barriers identified from the survey were selecting the most beneficial instructional method to be utilized and the issue with faculty compensation regarding the extra time associated with the remediation process. Composing and presenting student-engaged remediation plans is a difficult process, but these plans reinforce necessary performance criteria designed for student completion and success. A study performed by Hinshaw et al reported a significant amount of faculty stress already accompanying the academic and clinical responsibilities of dental hygiene educators.²⁰ As one of the respondents stated, "Student remediation exercises fall under the umbrella of 'office hours', which is already overbooked!" Faculty collaboration to institute a specific policy and procedure regime could decrease the amount of time spent in the overall faculty involvement of the remediation process. Faculty compensation was nonexistent in 69.3% of the programs who responded. Many schools have experienced a decrease in funding, resulting in a shortage of faculty salary funds.²¹

Conclusion

This study was based on concepts presented in a 1998 report on clinical skill remediation. It appears that little has changed in this area of remediation in the past 15 years. A greater depth of investigation into the field of specific remediation methods utilized, barriers to implementation and methods demonstrating the most successful outcomes would be useful.

The faculty involvement in the remediation policy development and presentation would be interesting. Training programs, including topics such as early identification of students needing clinical remediation, methods for delivery of remediation and preparation of remediation documents and legal issues, need to be developed. In summary, the topic of clinical skill remediation is one that offers multiple avenues for further research, as is demonstrated above.

Donna F. Wood, RDH, MS, is a clinical assistant professor and junior clinic coordinator in the Department of Dental Hygiene at the University of Oklahoma College of Dentistry. Tanya Villalpando Mitchell, RDH, MS, is an associate professor and Director of Graduate Studies, Division of Dental Hygiene. Lorie A. Holt, RDH, MS, is an associate professor and Director of Degree Completion Studies, Division of Dental Hygiene at the UMKC School of Dentistry. Bonnie G. Branson, RDH, PhD, is a professor at the Department of Dental Public Health and Behavioral Science at the UMKC School of Dentistry.

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