Skills Development Assessment of Dentistry Students in the Online Clinical Dentistry

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Abstract *– This study aims to identify the skills development assessment of Dentistry students in the online Clinical Dentistry by the Clinical Instructor. More specifically, it aims to (1) present the profile of the Clinical Instructors in terms of age, gender, educational attainment and number of years teaching Clinical Dentistry, (2) skills assessment based on (a) preparedness, armamentarium, and Infection Control, (b) problem solving, clinical reasoning and integration of relevant scientific evidence and (c) clinical skills (3) and test of significant difference in the assessment based on the profile of the Clinical Instructors (CI) and skills development assessment of dental clinicians. Descriptive type of research was utilized in the study. The study recommends the enhancement of the curriculum to make it more adaptive to the scenario created by the Covid 19 pandemic.*

Keywords *– assessment, Clinical Dentistry, online clinic, skills*

INTRODUCTION

The Covid 19 pandemic has brought a lot of challenges in the health system and the economy around the globe. Inevitably, medical, and dental schools implemented a variety of strategies to deal with the unusual condition in order to maintain a healthy atmosphere for faculty, staff and students to adapt to the new normal. As a result, the national government and the Commission on Higher Education (CHED) introduced regulations concerning social distancing, movement restrictions, community quarantine and lockdowns depending on the number of Covid cases in different areas. This led to the complete suspension of universities and faculties on-site educational activities, including dental schools [1].

Dental students, clinical instructors and dental educators were forced to stay at home, while their practical clinical sessions were substituted with other forms of dental education [2]. Dental educators had to come up with new, innovative ways of ensuring the partial continuation of knowledge dissemination based mainly on using online platforms and other informative technology methods, including primarily live streaming and video conferencing lectures, with virtual problem-based tutorials among others adopted to deliver curricula programs and motivate students to continue learning.

The online clinical platform is a new strategy that the university implemented to adapt to the new normal. In this platform the Clinical Instructors (CI) monitor the dental clinicians' work in their typodonts via Zoom. Like in the traditional clinical training, the dental clinicians will seek the approval of the Clinical Instructor on the case they propose to do on that clinical duty. The CI will observe while the dental clinician does the step-by-step procedure. After each procedure, dental clinicians will seek the approval of the CI if they can proceed to the next step. Clinicians are required to take picture of the step-by-step procedure for proper documentation and final checking of the procedure. Truly, there is no substitute for actual clinical cases involving patients in the clinic.

Dentistry is a profession that requires a broad understanding in basic health sciences, oral sciences and its clinical application in treating dental patients [3]. Majority of students expressed their desire to return to school [2] despite the stringent protocol that the national government wants to implement for them to experience the practical session. The face to face, dental clinicians and CI teaching pathways is still considered the best educational practice specifically for dental schools since dental education is not only focused to the acquisition of knowledge but most importantly the development of skills. Clinical professions are often concerned not just with knowledge acquisition, but achievement of skills and their application [4]. According to Chouchene et.al. [5], insufficient clinical experience may lead to decreased clinical competency in the undergraduates. This lack of a 'real scenario' might have an immense impact on the

skills development of the clinicians specially in the practical application that may affect their chances of passing the board examination and their future as dental professionals. This research assessed the skills development of the dental clinicians using the online clinical platform. This is important to identify their level of skills development primarily in the online clinic as part of their preparation for the practical phase of the board examination.

OBJECTIVES OF THE STUDY

This study aimed to identify the skills development assessment of Dentistry students in the online clinical dentistry by the Clinical Instructor. More specifically, it aims to (1) present the profile of the Clinical Instructors in terms of age, gender, educational attainment and number of years teaching Clinical Dentistry, (2) skills assessment based on (a) preparedness, armamentarium, and Infection Control, (b) problem solving, clinical reasoning and integration of relevant scientific evidence and (c) clinical skills (3) and test of significant difference in the assessment based on the profile of the Clinical Instructors (CI) and skills development assessment of dental clinicians.. Finally, the researcher shall propose an action plan based on the result of the study.

MATERIALS AND METHODS

Research Design

This study utilized a descriptive survey method to assess the skills development of the Dentistry students in clinical dentistry using a survey instrument. A descriptive quantitative analysis investigates variables in a single sample and tests, explains, and interprets them in a systematic manner [6].

Participants of the Study

The respondents of the study were nineteen (19) Clinical Instructors (CI) handling Clinical Dentistry for the 1st and 2nd Semester SY 2020-2021.

Instrument

The instrument is composed of two (2) parts: profile of the Clinical Instructor which includes the age, gender, educational attainment and number of years teaching Clinical Dentistry and skills development assessment of online clinical dentistry. The basis for the skills assessment to be used in the study is the Daily Clinical Assessment Rubric presented in the study of Dilbone, et al. [7]. Four-point likert scale will be used to measure the level of performance of the dental clinicians: 4=far above standards; 3= above standards 2= meet standards; 1=below standards.

RESULTS AND DISCUSSIONS

Table 1
Distribution of Respondents' Profile (N=19)

Profile Variables	Frequency	Percentage
Age		
25 - 29 years old	5	26.3
30 - 34 years old	2	10.5
35 - 39 years old	2	10.5
40 - 44 years old	4	21.1
45 - 49 years	2	10.5
50 years old and above	4	21.1
Sex		
Male	5	26.3
Female	14	73.7
Educational Attainment		
College Graduate	8	42.1
Masters' Degree	11	57.9
Number of Years in Teaching		
1 - 10 years	12	63.2
11 - 20 years	2	10.5
21 years and above	5	26.3

Table 1 shows the distribution of the respondents of the study. Most of the respondents belong to the 25-29 age group with 26.3% followed by 40-44 age group with 21.1%. Also, most of the respondents are female (73.7%) with Masters' Degree (57.9) and has 1-10 years of teaching (63.2).

This goes to show that the clinical instructors of the Dentistry department belong to the young adult and seasoned instructors age group with masters' degree. This mixture of generation balances the different dynamics in teaching applicable to the young generation especially in times of the Covid 19 pandemic.

The ability to understand the younger generation and guidance of the seasoned instructors are essential combination to combat the inevitable changes brought about by the pandemic.

This finding construed Parsazadeh et.al [8] that the success factors in using online learning is defined in terms of ease of access for students and teachers, student's satisfaction and the provision of a variety of online tools. Clinical Instructors from the young age group are more adaptive to technology and innovation with the guidance of seasoned clinical instructors.

Table 2
Skills Assessment Based on Preparedness, armamentarium and infection control

Indicators	WM	VI	R
1.Skilled and purposely communication skills	2.84	Above standards	3.5
2. Prepared all the needed materials and instruments for the case.	2.84	Above standards	3.5
3. Wear uniform, blazer, face shield and mask.	2.95	Above standards	1.5
4. Seeks feedback.	2.95	Above standards	1.5
Composite Mean	**2.89**	**Above standards**	

Legend: 3.50-4.00=far above standards;2.50-3.49=above standards;1.50-2.49=meet standards;1.00-1.49=below standards.

Table 2 shows the skills assessment of the respondents based on preparedness, armamentarium and infection control of the clinicians undergoing Clinical Dentistry. All indicators presented on the table were verbally interpreted as above standard. Rank first is the wearing of uniform, blazer, face shield, and mask as well as seeking feedback with the highest weighted mean of 2.95. Followed by prepared all the needed materials and instrument for the case and skilled and purposely communication with the weighted mean of 2.84.

This goes to show that the implementation of the guidelines for online clinic in Clinical Dentistry is highly regarded. These skills being demonstrated are the basic training all dentistry students must comply in preparation for the new normal in the clinical setting. These training exercises are the basic foundation of infection control that will be very useful when face to face is implemented. This finding collaborate with the findings of Atas & Yildirin [9] that clinicians gave good responses regarding the standard measures they take to protect against transmission of COVID-19, however, their understanding and attitudes about the additional measures they may take should be enhanced.

Table 3 shows the skills assessment of the respondents on the problem-solving clinical reasoning and integration of relevant scientific evidence of the clinicians undergoing Clinical Dentistry. All indicators presented on the table were verbally interpretation as above standards. Seeks more information and ask insightful question regarding the case and demonstrate understanding and application of relevant concept in Dentistry ranked 1.5 with the weighted mean of both 2.84. While foundation knowledge is complete and accurate and clear communication of information were both ranked 3.5 with the weighted mean of 2.68.

Table 3
Skills Assessment Based on Problem solving, clinical reasoning and integration relevant scientific evidence

Indicators	WM	VI	R
1.Seeks more information and ask insightful question regarding the case.	2.84	Above standards	1.5
2.Demonstrate understanding and application of relevant concept in Dentistry.	2.84	Above standards	1.5
3. Foundation knowledge is complete and accurate	2.68	Above standards	3.5
4. Clear communication of information.	2.68	Above standards	3.5
Composite Mean	**2.76**	**Above standards**	

Legend: 3.50-4.00=far above standards;2.50-3.49=above standards;1.50-2.49=meet standards;1.00-1.49=below standards.

Seeking more information and asking insightful questions are means of good communication and feedback in the online clinic. This exchange of ideas presents collaboration and understanding of the task being done in the online clinic. This finding is congruent to the study of Manogue et.al. [10] that was cited by Taylor at.al [4] that assessment can take place in a controlled academic setting, or at a distant site involving submission of coursework or online activities. Regardless of the format, it should be effective. Defined skills should be assessed which are directly related to intended learning outcomes.

Table 4 shows the skills assessment of the respondents based on the clinical performance of the clinicians. All the indicators presented on the table were verbally interpreted as above standards. Top on the rank of the indicators were follows faculty directions and guidelines set for clinical dentistry with the weighted mean of 3.0 followed by accomplished clinical procedures somewhat independently and competently and demonstrate appropriate level of technical skills with the weighted mean of 2.89 and 2.89 respectively.

This goes to show that online clinic can help in the development of skills in Clinical Dentistry of the clinicians. Although online clinic has its own limitation due to the absence of live patients being treated by the clinicians, they are still capable of developing their skills in terms of independence and competency.

Table 4
Skills Assessment Based on Clinical

Indicators	WM	VI	Rank
1.Demonstrate appropriate level of technical skills.	2.84	Above standards	4
2.Accomplished clinical procedures somewhat independently and competently.	2.89	Above standards	3
3.Follows faculty directions.	3.00	Above standards	1.5
4.Follow the guidelines set for clinical dentistry.	3.00	Above standards	1.5
Composite Mean	**2.93**	**Above standards**	

Legend: 3.50-4.00=far above standards;2.50-3.49=above standards;1.50-2.49=meet standards;1.00-1.49=below standards.

Their ability to follow directions and guidelines, although through online method, has displayed their interest and understanding of the clinical exercises being done. This finding is similar to the study of Safura and Qamaruz [3], that clinical assessment based on minimum level of clinical activity is required of the students to ensure that they are competent upon their graduation. An effective assessment procedure should provide a reliable, valid and practicable assessment of knowledge, understanding and its application, clinical competencies, problem solving performance and professional attributes. The assessment should provide some means of feedback to the students on their performance so that they can improve themselves and able to learn from their experience.

ANOVA result on Table 5 shows that there is no significant difference on skills assessment by clinical instructors in terms of preparedness, armamentarium and infection control, problem solving, clinical reasoning and integration of relevant scientific evidence, and clinical skills when the respondents were grouped according to profile. Regardless of age, sex, educational attainment and number of years in teaching, the clinical instructors have same assessment on skills development of dental clinicians using online clinical platform. This goes to show that the clinical instructors of the College of Dentistry have the same criteria and assessment methods used in the online clinic. Those years of practice teaching Clinical Dentistry before the pandemic has helped them develop certain standards that is very useful in their assessment of skills of the clinicians in the online clinic.

This finding aligns with the study of Chouchene et. al [5], that mobile learning may provide continuous access to the learning process, as well as the option of distant education without geographic or temporal constraints. It also improves the domain knowledge model by tailoring it to the needs of the students and the pace at which they like to study. Furthermore, it generates individualized tutoring suggestions to assist clinicians in the educational process.

Proposed action plan for the improvement in the skills development assessment of the Dentistry student.

Table 5
Difference of Responses on Skills Assessment when Grouped According to Profile

Profile Variables	F-value	p-value	Interpretation
Age			
Preparedness, armamentarium and infection control	0.812	0.562	Not Significant
Problem solving, clinical reasoning and integration of relevant scientific evidence	0.786	0.578	Not Significant
Clinical skills	0.304	0.902	Not Significant
Sex			
Preparedness, armamentarium and infection control	0.301	0.591	Not Significant
Problem solving, clinical reasoning and integration pf relevant scientific evidence	1.012	0.328	Not Significant
Clinical skills	0.187	0.671	Not Significant
Educational Attainment			
Preparedness, armamentarium and infection control	0.01	0.923	Not Significant
Problem solving, clinical reasoning and integration of relevant scientific evidence	0.008	0.931	Not Significant
Clinical skills	0.034	0.857	Not Significant
Number of Years in Teaching			
Preparedness, armamentarium and infection control	1.222	0.321	Not Significant
Problem solving, clinical reasoning and integration of relevant scientific evidence	1.446	0.265	Not Significant
Clinical skills	0.565	0.579	Not Significant

Legend: Significant at p-value<0.05

Table 6
Proposed action plan for the improvement of skills development assessment of Dentistry students

Objectives	Activities	Person Responsible	Participants	Evaluation
Curriculum Enhancement	Create a problem based and case reinforced learning of handling patients in the online clinic	Clinical Instructor of the College of Dentistry	Dentistry Students from DDM 3 & 4	Case Defense

CONCLUSION AND RECOMMENDATION

Most of the respondents in the study belongs to the 25-29 age group with 26.3% followed by 40-44 age group with 21.1%, female (73.7%) with Masters' Degree (57.9) and has 1-10 years of teaching (63.2). Skills assessment based on preparedness, armamentarium, and infection control measures; all indicators were found to be above standards. Skills assessment based on problem solving. Clinical reasoning and integration of relevant scientific evidence, all indicators were found to be above standards. Skills assessment based on clinical skills; all indicators were found to be above standards. There is no significant difference on skills assessment by clinical instructors in terms of preparedness, armamentarium and infection control, problem solving, clinical reasoning and integration of relevant scientific evidence, and clinical skills of the respondents.

Curriculum enhancement and development with the horizontal and vertical integration of medical and dental subjects can be implemented in the online clinic of the College of Dentistry to make it more adaptive to the scenario created by the Covid 19 pandemic. Also, to further enhance the knowledge and skills of the Dentistry students, increasing their clinical experience with presentation of different case scenarios can be beneficial while doing their clinical requirements.

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