

New Teaching Tool Aims to Improve Dental Hygiene Students' Clinical Assessment of Oral Lesions

This article was published in the following Scient Open Access Journal:

Journal of Dental and Oral Health

Received December 21, 2016; Accepted February 15, 2017; Published February 24, 2017

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Abstract

Purpose/Objectives: The project was initiated to increase dental hygiene students' ability to organize information in a way that facilitates critical thinking, problem solving and recall of information. Beginner clinicians faced with identifying a lesion have difficulty organizing their thoughts to systematically reach a conclusion. A tool was developed to support the process of forming mental scripts to arrive at an accurate dental hygiene assessment of clinical lesions.

Methods: Quantitative and qualitative research method was used to demonstrate the benefits of the Case Study Assessment Tool (CSAT). Students used the CSAT to formulate a dental hygiene assessment of clinical lesions. The CSAT was created with steps guiding the students to systematically gather research and reflect on relevant information. One group of students were given two patient cases and asked to evaluate the data presented, and then answer questions related to the location and description of the lesion. At the end of the semester, students completed a seven question survey and participated in a structured interview. Another group of students participated in the quantitative research only.

Results: The project recruited one hundred twenty-eight dental hygiene students enrolled in an oral pathology course with forty seven participants completing the quantitative research and eight completing the qualitative research. The results indicated the CSAT provided a systemic approach for students to identify clinical lesions.

Conclusion: Results showed students agreed the CSAT guided them in their ability to describe and identify a lesion while researching the topic and assisting to expand their knowledge about the lesion.

Keywords: Scripts, Assessment tool, Critical thinking, Problem solving, Reflection

Introduction

Dental hygiene students in the oral pathology course providing patient care have a difficult time accurately describing oral lesions, understanding their etiology and applying this information to form a dental hygiene assessment of oral lesions. Dentists depend on the accuracy of these findings to correctly diagnose these lesions. A search of literature revealed medical students processed information by forming mental scripts of specific details that eventually led to an accurate diagnosis [1]. Beginner dental hygiene clinicians when faced with a diagnosis take more time going through their mental scripts. Experienced clinicians use the same process but arrive at an accurate diagnosis in much less time. The aim of the study was to evaluate the case study assessment tool (CSAT) as an aid for developing mental scripts for the beginner dental hygiene clinician and enhancing critical thinking to problem solve a case study in oral pathology [2]. The CSAT provides dental hygiene students a step by step process to guide their choices along a path to derive an accurate dental hygiene diagnosis of a clinical lesion. The step by step guide begins with the patient's relevant history, symptoms, and continues along a track providing selections for clinical features, location and description of the lesion and radiographic survey. Each selection supports students gathering data to enable them to make decisions on identifying the clinical lesion. The survey results support the benefits of dental hygiene students using the CSAT to improve critical thinking, reflection, and communication while accurately assessing a clinical lesion [3].

Materials and Methods

A mixed research method of quantitative and qualitative assessment was used to

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ORAL PATHOLOGY

CASE STUDY ASSESSMENT TOOL (CSAT)

CASE DATA:

STEP 1: Document data supporting your findings:

History:
Information from Case Study:

Symptoms:
Information from Case Study:

Clinical Features:
Draw the anatomic location of the lesion/s

Location of Lesion: Identify the location of lesion/s

Circle:

Head	Neck	
Lip	Buccal Mucosa	
Gingiva	Tongue	
Floor of the mouth	Palate	

Lesion Description:

Texture: Circle:

smooth	irregular	
papillary	rough	
fi ssured	corrugated	

Color: Circle:

white	red	
blue-black	purple	
gray	yellow	
black	brown	
pink	salmon	

Consistency: Circle:

soft	firm	
fluctuant	indurated	
hard	mobile	

Outline: Circle:

regular	irregular	
well-defined	well-circumscribed	

Border: Circle:

flat	raised	
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Attachment: Circle:

pedunculated	sessile	
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Size: _____ mm / _____ cm

Lesion Categories: Circle:

bulla	papule	lobule
pustules	vesicle	macule
wheel	plaque	nodule

Radiographs: Circle:

Yes	No	
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Type of radiographic survey: Circle:

BW X	CMRS	Panaramic	Other
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Radiographic Findings:
Terms: coalescence, diffuse, multilocular, radiolucent, radiopaque, root resorption, unilocular, corticated, and well-circumscribed

Identify findings from case study:

STEP 2:

a. Based on gathering all the information provided from the case study, develop a written description of the lesion.

b. Based on formulating a description, identify the lesion.

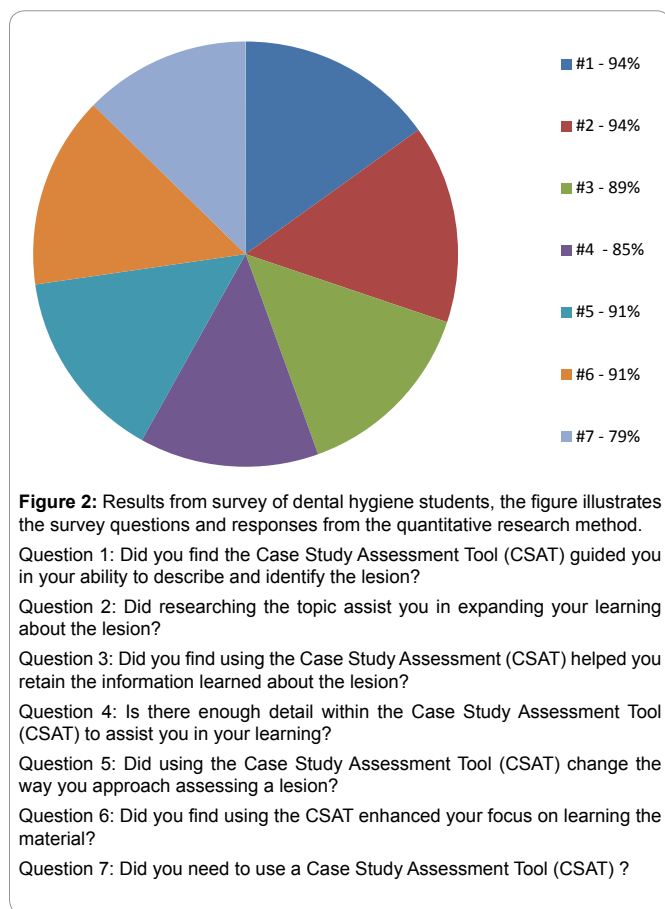
Figure 1: Case Study Assessment Tool (CSAT)

demonstrate the benefits of the Case Study Assessment Tool (CSAT) used by dental hygiene students to formulate a dental hygiene diagnosis. The MCPHS University Institutional Review Board (IRB) approved the participation of students in the research study. The approval number is IRB022714L. The CSAT (Figure 1) was created with steps organized to guide the students to systematically gather and reflect on relevant information. Over the course of spring 2014 and 2015 semester, students were assigned two cases studies, in which they were asked to evaluate the medical/dental history and the radiographs, and then answer questions related to the location, and description of the lesion using the CSAT. At the end of the semester, these students completed a seven question survey and participated in a structured interview. Another group of dental hygiene students in the oral pathology spring 2016 course participated in the quantitative research only.

Current and past dental hygiene students enrolled in the Oral Pathology course for spring of 2014, spring of 2015, and spring of 2016 were invited to participate. For the dental hygiene students from the spring of 2014 and spring of 2015, there were two phases to the research study. In the first phase, students were assigned an oral pathology case study and asked to describe and identify an oral lesion without using the case study assessment tool (CSAT). In the second phase, dental hygiene students were asked to solve the same oral pathology case study implementing the use of the case study assessment tool (CSAT). After both phases were completed, the dental hygiene students participated in a quantitative survey which consisted of seven multiple choice questions and a qualitative interview consisted of open-ended questions. During the interview, the information was recorded using a recording device and analyzed to identify themes and codes. The two authors independently reviewed the interviews to isolate themes. Codes were assigned on recurring frequency of answers. For the dental hygiene students from spring of 2016, students participated in the same quantitative survey as the students of spring 2014 and spring of 2015 which consisted of seven multiple choice questions.

Results

One hundred twenty eight current and past oral pathology students were invited to participate. The study included forty seven participants, 40 female and seven male completed the quantitative study and seven female and one male completed the qualitative study. The participant pool consisted of post baccalaureate and accelerated BSDH students. The students' ages were between eighteen and forty years of age. The survey data results indicated forty four students agreed the CSAT guided them in their ability to describe and identify a lesion and researching the topic assisted to expand their knowledge about the lesion (See Figure 2). Forty three of the students answered yes when asked if the CSAT helped them retain information. Forty students felt there were sufficient questions on the tool to guide the process, six students did not, and one did not respond to the question. Thirty seven students indicated that they would continue to use the CSAT in their clinical practice. Students indicated the advantage of using the CSAT was that it provided structure and organization to direct their decision making process. Some of the reasons students did not feel the CSAT was helpful for guidance was the need for more descriptions and more experiences using the CSAT. Results of the qualitative research students indicated common themes with diagnosis and interpretation, encouraged



critical thinking, reflection, increased clinician confidence, knowledge and communication. Students agreed use of the CSAT provided direction to an accurate assessment of a clinical lesion.

Discussion

This study evaluated a learner-centered tool (CSAT) to support students' ability to systematically identify and accurately document visual findings and research information that begins the process of establishing scripts they can draw upon when faced with identifying and documenting oral lesions during an assignment in the oral pathology course. The study provided data from students affirming the CSAT encouraged critical thinking, reflection, communication, clinician's confidence, and knowledge about a specific topic being researched.

The dental hygiene students have a difficult time knowing where to begin when they are presented with an oral lesion either during an assignment received in the oral pathology course or a finding/s discovered during a patient care experience session. The process of making a dental hygiene diagnosis for a beginner clinician can be a long and wearying process result without a definitive dental hygiene assessment. Challenges exist between how the students begin to research information effectively in a timely manner to come to an accurate clinical assessment. Students struggle with understanding the reasoning process and recognizing the results [1]. Dental hygiene students need direction to formulate pathways to assist them to a conclusive outcome. Scripts provide a pathway focused on systematic recall

of knowledge when clinicians are introduced to oral pathology finding/s [4]. Students need to develop frameworks to be able to form mental scripts to promote critical thinking and knowledge translation [3]. Each framework developed by the student is stored in their memory in the form of a script to be used for future identification of an oral lesion.

Scripts are defined as "knowledge structures associated with time sequences, with developments, events or actions as they transpire" [5]. In a descriptive cross-sectional study, 79.3 % of oral hygiene students found an assessment tool useful during a clinical session [4]. Forty four student participants responded yes to the question identifying the CSAT guided their ability to describe and identify a lesion. This mixed method study showed students agreed the CSAT provided an approach using a step by step guide to keep them organized and focused on arriving at an accurate clinical assessment. The CSAT provided direction for students to develop a system to establish mental scripts to analyze information. For example, in response to the question the student can take the signs and symptoms of a particular lesion and compare the relationship of the oral lesion/s with these findings. A student participant expressed "I didn't really have an order, so to be honest I was all over the place before the CSAT. After using the CSAT, it gives you an order to go by". During the process of assessing for information, creating rationales can trigger more scripts [5]. These scripts are general and can be applied to many oral lesions. A student participant demonstrated the importance of the CSAT for assessment and interpretation purposes by expressing "making sure that any descriptive factors that could be used to describe it are used. So it's an outline for you, a template to refer back to and make sure you think of all the different things that could be incorporated into diagnosing or interpreting the lesion".

A qualitative study done by Wainwright, Shepard Harman and Stephens identified the importance of critical thinking and problem solving to make decisions for providing patient care [6]. The findings from a study by Beistle and Palmer identified faculty having an unyielding desire to integrate critical thinking into their course work. This qualitative study indicated the usage of the CSAT encouraged critical thinking for five out of the eight dental hygiene student participants. A learner centered method will provide students an opportunity to assist in their own learning needs [7]. The quantitative study revealed forty three students participants agreed using the CSAT changed the way they approached assessing a lesion. One student participant of the study expressed "the CSAT breaks down certain categories to describe, so you can identify the color, location, and consistency. So, it is breaking down into specific categories making you approach it to look at different angles to describe it". The CSAT provides a step by step approach to develop critical thinking with oral pathology finding/s. Each exposure to the CSAT will provide an opportunity for the dental hygiene students to build scripts and to retrieve information faster with each time they are required to identify a lesion/s [8].

The dental hygiene student participants expressed that the usage of the CSAT increased communication between the student and the patient and the dental hygiene student and the dentist. A research study done by Schonwetter, Wener, and Mazurat discussed the significance of students being patient centered for clinical communication [9]. This qualitative survey showed a dental hygiene student participant expressing "you know

based off of all the categories that you are looking at whether or not this is something that you want the dentist to look at. It reinforces to me that I knew that I needed to make sure that the dentist really knew I wanted him to focus in on the lesion". According to Wener, Schonwetter and Mazurat, "a fundamental premise on communication skills is that patients have better health outcomes when the provider is a good communicator, thus, the major thrust of the patient-centered principle is to encourage the development of caring oral health care providers able to communicate their concern effectively" [10,11]. The CSAT increases effective communication with the student and patient. For example a response from a student's interview revealed communication and confidence, "If I had a patient with an oral lesion and I followed the CSAT and I could say, well, here are my findings". Data signified the CSAT increases knowledge. One student interviewed expressed "this tool has helped accelerate my learning and my execution". Another student pointed out "Yes, definitely because the CSAT helped me just to identify certain things that could be associated with other conditions. It helped narrow in my research, too, so that way I could do better, focused research. So I thought that it really helped my ability to do it". The use of the CSAT encouraged students to reflect. Students' ability to reflect improved over a period of time and contributed to the development of critical reflective skills [12]. Reflection on patient care experiences presenting with an oral lesion is vital for dental hygiene students to understand their experiences [13]. The method of "meaning-making" by the dental hygiene student reflecting on assessing a clinical lesion during a patient care session or an assigned oral pathology case study is a basic element of developing critical thinking [13]. Reflection was applied during usage of the CSAT to connect new learning to existing knowledge and skills [14]. This learning strategy, reflection, is beneficial to understand one's strengths and weaknesses to enhance their own learning [14]. Reflective assessment tools are helpful to students to process thoughts in arriving to a clinical dental hygiene assessment of a clinical lesion [14].

The information gained from this study shows the importance of establishing a framework for dental hygiene students in developing scripts for the assessment of potential clinical lesions identified during future patient care. Recent graduated hygienists can reflect on these experiences with formed scripts to guide them in assessing the clinical lesion.

The limitation of the study was the small pool of participants recruited from the oral pathology course. This was due to student's time constraints and prior commitments to their course requirements that limited their availability to commit to the project. The small number of participants did not provide a wide range of responses. The CSAT tool was unavailable chair side for students to use in the clinic. The resource of the CSAT was not available at all times in the clinic prohibited students from participating in using the CSAT immediately with the patient providing their input.

Conclusion

The approach for clinical decision making development is unorganized for the beginner clinicians and can lead to errors. It

is essential to provide beginner clinicians a framework consisting of personal and professional experience, clinical decision making, and reflection for the dental hygiene student to arrive at an accurate dental hygiene diagnosis.

Acknowledgement

The authors would like to acknowledge Mark Lerman, D.M.D., Associate Professor and Division Director of Oral Pathology at Tufts University School of Dental Medicine (TUSDM), for providing his input into the paper and allowing the oral pathology students in his course at MCPHS University to participate in the study.

We would like to thank Mariana Lapidus, Associate Professor and Research Coordinator at MCPHS University, for her devoted time with the literature search and for the MCPHS University, Forsyth Dental Hygiene Students for taking the time to participate in the study.

Disclosure

We certify that there is no conflict of interest with any financial organization regarding the material discussed in this manuscript.

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