37TH ANNUAL RESEARCH DAY

ABSTRACTS

Friday, April 1, 2022

School of Dental Medicine
DENTAL INTEGRATED FOR HEALTH

Faculty
Title: Emotional VR Avatars as a Learning Tool in Dental Education
Clint Carlson, Amisha Singh, Tracy de Peralta, Shiela Kennedy, Denise Kassebaum

Purpose: The use of avatar-based simulations enhances the ability of the participant to reflect on and practice their interactions with patients in a safe, yet realistic, environment. We can now leverage our experience in virtual reality beyond the “technical” skills and better evaluate our communication with patients. The aim of this study was to determine the perceived value and anticipated benefit of using a learning tool involving avatars for communication skills in sensitive patient conversations.

Methods: The study population included students in the 3rd year of the DDS program at the University of Colorado School of Dental Medicine (CUSDM) who volunteered to participate. For this purpose, implementation of a FERPA-compliant survey using Qualtrics was distributed via email to cohort members. This survey was used to measure the student-anticipated outcomes of a future learning exercise involving avatars. Themes such as confidence, emotional resiliency, and the impact of various patient simulation activities on communication were included in survey questions. Ordinal data was analyzed to identify themes and trends.

Results: A response rate of 40% for the distributed pre-survey to 80 dental students was observed. Results demonstrated that students have a high confidence rate regarding patient communication before clinical education (M=3.87, SD=0.75). They anticipate the minimal positive outcome of the avatar learning experience as compared to a live actor (M=2.65, SD=1.00), but students perceived the value in replaying a patient conversation through the use of an avatar learning tool (M=3.58, SD=1.07). Students expressed that the emotional response of a live patient would be a significant factor in healthcare decisions (M=4.52, SD=0.67) but felt neutral about the impact of a simulated patient’s emotional response impacting performance as a provider (M=3.26, SD=1.11).

Conclusions: We conclude from this study that students do perceive some value and anticipate the benefit of using an emotional VR avatar learning tool for communication skills in sensitive patient conversations, but have reservations about the avatar’s ability to simulate the nuances of human connection.
Title: NaF Dose Response on Bacterial Metabolism in Salivary Biofilms
Morgan Gonder, Craig Shellhart, Terri Tilliss, Gerald Minick, Clifton Carey

Objectives: Knowledge of the dose response of fluoride concentrations on salivary biofilm metabolism may be beneficial for the control of dental plaque. The purpose of this study was to measure bacterial metabolism in a salivary biofilm exposed to fluoride at varying concentrations.

Methods: A range of concentrations of sodium fluoride between 0 and 10,000 ppm F was added to aliquots of whole saliva which were then allowed to develop biofilm for 24 hours at 37°C. Because the microbial composition and metabolic activity of whole saliva can vary from one collection time to the next, each experimental run contained all experimental fluoride concentrations using aliquots of saliva from the same daily pool. Thus, each experiment was run with a unique pool of saliva for biofilm formation, n=16. The outcome was spectrophotometric absorbance of the MTT complex at 450nm which is in proportion to NAD(P)H concentration reflecting the biofilm viability as a function of increasing fluoride concentrations. All experiments were repeated using NaCl to adjust the ionic strength of the NaF solutions to be the same.

Results: No differences were detected between the ionic strength adjusted and non-adjusted MTT absorbances at each NaF concentration, p>0.05. ANOVA and ranked comparison found that the MTT absorbance for 1~10<100>1,000>10,000 ppm NaF. This indicates that above 100 ppm NaF the rate of metabolism in the samples decreased.

Conclusions: Fluoride therapies that contain more than 100 ppm F may be beneficial by slowing down dental plaque metabolism, thus reducing the production of acids.
Title: Evaluating the Trust in the Patient - Dentist Relationship
Tamanna Tiwari, Jakob Holtzmann, Lindsey Yates

Background: The objective of this paper was to understand the trust of study participants in dental providers and trust building practices used by dentists to establish and maintain trust with their patients.

Methods: This study used a concurrent cross-sectional mixed methods design to measure the participants’ trust in their dental providers. An 11-item Dental Trust Scale (DTS) questionnaire was administered to 150 White, Black, and Hispanic study participants. Additionally, the research team conducted semi-structured interviews with seven dentists in order to understand their perspectives related to patient trust. The internal consistency of the DTS was tested using Cronbach's alpha. Univariate and multivariable logistic regression models were run to test the association between the DTS mean score and individual participant factors. Qualitative information from interviews was analyzed using a thematic analysis approach.

Results: The overall mean score of dental trust for the entire sample was 3.4. The DTS had good internal consistency (α = 0.93). Overall, dental trust was significantly higher in participants who had a regular dentist (F: 8.74, p: 0.003). The qualitative data were grouped under these key thematic categories: the importance of trust, building trust, trust in treatment planning. Qualitative analysis also showed that the two main trust-building tools used by dentists were communication and understanding the patient's lifestyle or social determinants of health.

Conclusion: This study provides insight into the dentist-patient relationship. It increases our understanding of levels of dental trust amongst patients and examines methods used by the dentist to build trust. The outcomes of this study can be considered by dentists in their everyday practice as they seek to build trust with their patients.
Title: Remote Learning: Rising Up to Student-Perceived Best Practice
Jay Tippets, Jennipher Murphy, Elizabeth Ramos, Salina Evans, Tracy de Peralta

Introduction: What would have happened if it was not COVID-19 that drove us to remote learning, but instead was simply a curriculum delivery of choice by our students?

Aims: The purpose of this study was to measure the perceived value held by students for components of remote learning.

Methods: For this purpose, data was collected via survey and focus groups, involving students in two later years of a 4-year DDS curriculum (DS3 and DS4), and students in an Advanced Standing DDS program (ASP1 and ASP2) at the University of Colorado School of Dental Medicine. Where survey data was collected for all four named cohorts, two focus groups (DS3 and ISP2) were conducted via Zoom. Focus group data was collected via transcription using dictation software. Transcripts were coded by three investigators for theme identification in order to determine theme-consensence.

Results and Discussion: The results included survey data from DS3, DS4, ISP1, and ISP2 classes and focus group data from 2 of the 4 classes, ISP1 and DS4. Out of the total of 240 students surveyed, 30% responded. Survey data demonstrated that students value asynchronous pre-recorded lectures, small group sessions, lecture chat tool and felt they were better able to manage their time in the remote learning format. On the other hand, the students did not value (means below 3) synchronous lectures, textbooks, social media, or test security in the remote learning environment. Across all 4 cohorts, students responded that they were highly impacted by technology challenges and Zoom fatigue. Theme analysis of focus groups identified themes consistent with those values highlighted in survey data.

Conclusion: In determining the ideal remote learning format, students most valued asynchronous pre-recorded lectures, small group sessions and the lecture chat tool because they felt these formats and tools helped them to manage their time and learning.