



Faculty Research

Allied Dental Students Attitudes, Behaviors, and Perceptions on Disaster Victim Identification (DVI) Following a Multimedia Learning Experience

This white paper provides a summary of the work from:

Vest S, Bradshaw B, Voelker M, Bruhn A, Newcomb T, Sikdar S. Allied Dental Students Attitudes, Behaviors, and Perceptions on DVI Following a Multimedia Learning Experience. *J Dent Hyg.* 2024 Apr; 98(2): 30-38.

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Overview

Disaster victim identification (DVI) service requires knowledge, confidence, and an attitude (KCA) of readiness. Registered dental hygienists and dental assistants are often recruited as volunteers to support forensic odontologists in human identification efforts during mass fatality incidents (MFIs). It is necessary to identify cognitive knowledge and confidence to perform these skills and the affective domain attitudes for service by these potential volunteers starting at the student level to help identify best practices for response implementation as well as potential barriers. The multimedia learning experience utilized in this study was examined as best practice for increasing knowledge, confidence, and attitudes of allied dental students for disaster victim identification and could be best practice used in other educational fields.

Purpose of the Research

The purpose of this study was to assess dental hygiene and dental assisting students perceived knowledge, confidence and attitude regarding disaster victim identification skills and topics following a multimedia learning experience and radiographic match activity. The research questions were:

1. Will allied dental students indicate an increase in perceived knowledge of disaster victim identification topics upon completion of the multimedia learning experience?
2. Will there be a positive association between degree of certainty in skill and radiographic match accuracy?

- Will allied dental students have an increased perceived affective importance of their respective profession to volunteer in future DVI upon completion of the multimedia learning experience?

Methods

This pretest/posttest study design involved a convenience sample (n=48) of senior dental hygiene and senior dental assistant students. The participants had a multimedia learning experience in a virtual, asynchronous format that consisted of a 15-slide PowerPoint presentation with educational text, photographs, audio/video recordings, and a simulated antemortem (AM) and postmortem (PM) radiographic match activity.

Findings and Discussion

Perceived Confidence in DVI Knowledge

Majority of participants (96.5%) indicated an increase in perceived knowledge (p-value < 0.0001) related to disaster victim identification (DVI) topics after completing the multimedia learning experience (See Table 1). Increased knowledge can help allied dental professionals overcome barriers from seeking specialized training and serving as DVI volunteers. Findings from Newcomb et al¹ and More et al², suggest that a multimedia approach in DVI training is needed and provides an increase in knowledge when compared to a low media approach. In the current study, photographs and audio/video recordings were used to immerse the participants in a simulated forensic environment, rather than providing simple text. This allowed the participants to have a better understanding of the skills and knowledge needed to perform DVI. The incorporation of a multimedia learning experience can provide foundational knowledge, without posing significant impediments on core curricula or require any substantial financial investment. Additionally, the multimedia learning experience can be offered multiple times for review and no specific length of time is required for completion, which has been recommended specifically for forensic training². For future use of the multimedia learning experience, a more interactive approach could better enhance learning outcomes such as clickable features or assessment questions throughout that requires the learner to participate before moving forward, to ensure competency.

Table 1. *Levels of Perceived Knowledge Related to DVI Topics*

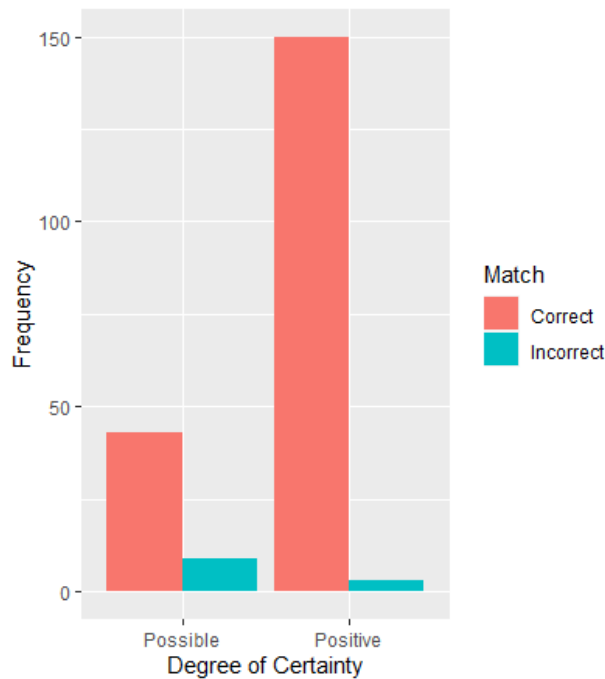
Type	Levels of Perceived Understanding:		
	What is a forensic odontologist and what is their role?		
	Slightly	Moderately	Extremely
Pre survey	21 (51.2%)	15 (36.6%)	5 (12.2%)
Post survey	1 (2.4%)	17 (41.5%)	23 (56.1%)
	Knowledge of DVI in MFIs		
	Slightly	Moderately	Extremely
Pre survey	28 (68.3%)	10 (24.4%)	3 (7.3%)
Post survey	2 (4.9%)	17 (41.5%)	22 (53.6%)
	Knowledge of Dental Morphology		
	Slightly	Moderately	Extremely
Pre survey	25 (61%)	9 (22%)	7 (17%)
Post survey	2 (4.9%)	13 (31.7%)	26 (63.4%)
	Knowledge of Dental Radiology in DVI		
	Slightly	Moderately	Extremely
Pre survey	15 (36.6%)	20 (48.4%)	6 (14.6%)
Post survey	1 (2.4%)	12 (29.3%)	28 (68.3%)

Association of Degree of Certainty with Match Accuracy

Within the multimedia learning experience, participants were provided a video simulation of matching randomized radiographs for identification purposes and how to determine certainty in making those matches. They were taught within the learning experience to identify certainty as either “positive” (high confidence) or “possible” (low confidence) based on the professional standard (American Board of Forensic Odontology) human identification scale. Following the multimedia learning experience, the participants were asked to complete a similar match activity seen in the learning experience and indicate their amount of confidence in their skills to complete the activity.

A Fisher’s exact test revealed a statistically significant association (p -value < 0.05) between participants reporting a “positive” degree of certainty and having a correct match (See Figure 1). These results show that the odds of having a correct match were greater when participants indicated a “positive” degree of certainty compared to a “possible” degree of certainty. This study also found a positive intra-rater reliability (0.203 (95% C.I. = (0.107, 0.300)) relationship among the participants when completing the repetition of the match activity. It is important to note that the dental assistant students reported receiving a previous education presentation on forensics and helped them feel more confident when completing the match activity, however, performed with lower accuracy rates, less overall confidence, and lower affective attitude towards future volunteerism. This could be related to individual proficiency, as well as differences in educational experiences including accreditation hours, length of program, and rigor of curriculum.

Figure 1. Correlation of Student Confidence and Radiographic Match Accuracy



Attitude Regarding Perceived Importance of Future DVI Volunteerism

After completing the multimedia learning experience, a linear trend test revealed a significant (p -value < 0.0001) improvement in attitude towards future forensic volunteerism in the participants respective profession. Dental hygiene students perceived the importance of volunteerism to be extremely important (77.8%) compared to the dental assisting students (50%) who increased only slightly following the multimedia learning experience.

Conclusions

Results from this study indicate that an intervention such as a multimedia learning experience can lead to successful cognitive and affective learning outcomes, as well as an increase in skill confidence. A multimedia learning experience could expand into a multitude of educational fields due to its simplicity, minimal cost, and adaptability into curriculum. Future research is needed to evaluate the consistency, reliability, and long-term outcomes of utilizing a multimedia learning experience in higher education its ability to be used across disciplines.

References

1. Newcomb T, Bruhn A, Giles B. Mass fatality incidents and the role of the dental hygienist: Are we prepared? *J Dent Hyg.* 2015 Jun; 89(3): 143–151.
2. More F, Phelan J, Boylan R, et al. Predoctoral dental school curriculum for catastrophe preparedness. *J Dent Edu.* 2004 Aug; 68(8): 851–8.