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Original article

The impact of complete denture making instructional videos on self-directed learning of clinical skills

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ARTICLE INFO

Article history:
Received 4 August 2014
Received in revised form
5 January 2015
Accepted 17 January 2015
Available online 14 February 2015

Keywords:
Video learning
Self-directed learning
Qualitative research
Dental education
Complete denture prosthodontics

ABSTRACT

Purpose: The aim of this research was to evaluate the effectiveness of a clinical instructional video with a structured worksheet for independent self-study in a complete denture program.

Methods: 47 multilingual dental students completed a task by watching an instructional video with subtitles regarding clinical complete denture procedures. After completion, students evaluated their learning experience, and 11 students participated in focus group interviews to gain further insight. A mixed-methods approach to data collection and analysis provided descriptive statistical results and a grounded theory approach to coding identified key concepts and categories from the qualitative data.

Results: Over 70% of students had favorable opinions of the learning experience and indicated that the speed and length of the video were appropriate. Highly positive and conflicting negative comments regarding the use of subtitles showed both preferences for subtitles over audio and vice versa. The use of a video resource was considered valuable as the replay and review functions allowed better visualization of the procedures, which was considered a good recap tool for the clinical demonstration. It was also a better revision aid than textbooks. So, if the students were able to view these videos at will, they believed that videos supplemented their self-study. Despite the positive response, videos were not considered to replace live clinical demonstrations.

Conclusions: While students preferred live demonstrations over the clinical videos they did express a realization of these as a supplemental learning material for self-study based on their ease of access, use for revision, and prior to clinical preparation.

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http://dx.doi.org/10.1016/j.jpor.2015.01.004

1. Introduction

Acquisition of competent psychomotor skills is essential in attaining competency in health-care professions. Clinical training has been obtained by receiving experts' written and verbal instructions, often in combination with live demonstrations, content lectures, tutorials, laboratory and clinical sessions. However, teaching of clinical skills is considered one of the most time-consuming parts in clinical education [1]. Therefore, there has been an increasing advocacy for the use of multimedia applications amongst medical educators due to their perceived benefits in assisting students to achieve better academic outcomes and clinical skill performance [2].

Video instruction of clinical skills has been uniquely found to be more time and cost effective in terms of decreasing both the tutors' workload [1] and the demand on faculty resources [3].

In dentistry videos also provide better viewing access and visualization of the small oral cavity that can eliminate students' missing opportunities for learning [4]. Video instruction can also be used as a calibration tool that ensures standardized information that may be problematic when delivered by different tutors [4].

The objective of this study of complete denture making in undergraduate dentistry is to explore the usefulness of in-house video resources of live clinical procedures in facilitating students' self-study.

2. Materials and methods

A mixed-methods research design was adopted to gather student perceptions of a new clinical learning resource. Quantitative survey data in the form of percentages is reported as descriptive statistics. Qualitative data in the form of open-ended written comments and interview data explored themes identified in the literature and provided elaborations on quantitative results.

2.1. Participants

Fifth-year Dental Surgery undergraduate students (25 females and 28 males) at an English medium-of-instruction (EMI) university who had completed the introductory clinical demonstration course on complete dentures watched a related clinical demonstration video related to clinical complete denture procedures. Six students were not able to join our study because they were attending other classes which coincided with our research timetable. Forty-seven students (22 females and 25 males) consented to participating in the research project as approved by the institutional review board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster (HKU/HA HKW IRB UW11-456).

Over one day, 22 females and 25 males were randomly assigned to watch the clinical video either alone ($n = 14$) or in 11 groups of three students ($n = 33$). Completion rate for the task was 100%. Students were invited an accompanying structured worksheet to focus their learning relating to the video contents. After watching the clinical video, all participants rated the usefulness of the instructional videos and worksheets (Table 1) using a four-point Likert scale (Table 2) [5,6].

Table 1 – Work sheet questions.

Video 1 Preliminary impression of upper jaw

(1) Outline the good or bad points of the preliminary impression in the video.
(2) If you consider there is some deficiency of the impression and if you were in the same situation, what should you consider prior to taking the preliminary impression?
(3) How would you modify the design of the custom tray for this impression?

Video 2 Modification of the lower custom tray

(1) What should you check and/or modify on the lower custom tray prior to taking the working impression?
(2) What are the factors affecting the stability and retention of the lower custom tray?

Video3 Establishing the upper occlusal plane

(1) What are the possible consequences if the occlusal plane of the final denture slope down posteriorly?
(2) Please write down in detail the key stages of establishing the upper occlusal plane.

Sixteen students' class schedules coincided with our research time table, and 11 of the 16 students consented to participate in our focus group discussion. The day following completion the video exercise, 9 students from the 4 groups and 2 students from the solo activity participated in the focus group discussion, these consisted of 5 female and 6 male students in total.

Two semi-structured focus group interviews were conducted.

2.2. Instructional resources

A clinical video was recorded during a demonstration by the course coordinator on a single patient. Written consent was obtained from the patient. The videos were edited to 3–4 min in length in order to focus on the key stage of the clinical features being demonstrated, for three different clinical skills.

The first two videos did not have audio but displayed a narrative explanation in the form of subtitles on the key features of the clinical demonstration. Due to production time constraints video 3 only included English audio narration with full subtitles. A supporting worksheet for watching the video posed structured questions emphasizing aspects of clinical skills was provided (Table 1).

2.3. Questionnaire

A written evaluation in the form of a questionnaire was administered immediately after students completed the video and worksheet tasks (Table 2). A questionnaire was designed to evaluate the teaching and learning experience provided and used a four-point Likert scale [5,6]. If a student neglected to fill out a space on the questionnaire, that response was classified as a not applicable. The questionnaire was made up of 18