Multimedia applications in nursing curriculum: The process of producing streaming videos for medication administration skills

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ABSTRACT

Purpose: Streaming videos (SVs) are commonly used multimedia applications in clinical health education. However, there are several negative aspects related to the production and delivery of SVs. Only a few published studies have included sufficient descriptions of the videos and the production process and design innovations. This paper describes the production of innovative SVs for medication administration skills for undergraduate nursing students at a public university in Jordan and focuses on the ethical and cultural issues in producing this type of learning resource.

Method: The curriculum development committee approved the modification of educational techniques for medication administration procedures to include SVs within an interactive web-based learning environment. The production process of the videos adhered to established principles for "protecting patients' rights when filming and recording" and included: preproduction, production and postproduction phases. Medication administration skills were videotaped in a skills laboratory where they are usually taught to students and also in a hospital setting with real patients. The lab videos included critical points and Do's and Don'ts and the hospital videos fostered real-world practices. The range of time of the videos was reasonable to eliminate technical difficulty in access.

Results: Eight SVs were produced that covered different types of the medication administration skills. The production of SVs required the collaborative efforts of experts in IT, multimedia, nursing and informatics educators, and nursing care providers. Results showed that the videos were well-perceived by students, and the instructors who taught the course.

Conclusions: The process of producing the videos in this project can be used as a valuable framework for schools considering utilizing multimedia applications in teaching.

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1. Introduction

Multimedia applications are being more heavily utilized for clinical courses in health education. Multimedia refers to "computer-based systems that use associative linkages to allow users to navigate and retrieve information stored in a combination of text, sounds, graphics, video, and other media" [1]. Given recent advancements in telecommunications and High-speed bandwidth Internet, streaming videos (digital videos streamed on the web) have become the most commonly used multimedia application to support clinical health education and to role-model practices. Learning benefits using streaming videos (SVs) are evident in areas such as achievement, technical skills, satisfaction, and self-confidence [2–9]. This strategy also offers flexible learning by allowing students to revisit sections of procedures they did not grasp the first time and it empowers students with a self-paced learning and control over the learning process.

Despite these benefits, there are several negative aspects that can be encountered related to the production and delivery processes of SVs. These include poor quality of videos, poor instructional design, cost, technical problems and low levels of student and faculty interaction, all of which result in unsatisfying learning experiences. For example, while the majority of dentistry students perceived SVs as an effective substitute for in-class demonstrations and rated the video quality as excellent [10], the majority of students in an asynchronous video streaming pharmacy class were unsatisfied about the learning experience and preferred a mixed-mode of teaching [11]. In a systematic review of 53 studies published from 2002 to 2011 on SVs, Kay found mixed results about the effect of SVs on students' attitudes, behaviors and performance. According to Kay, insufficient description of the SVs was the main methodological concern and "technical problems" in the delivery process was the main challenge for not using SVs [12].

Although there has been an increase in the use of SVs in health education, studies with sufficient description of the videos and the production process are few [13,14]. In addition, the majority of studies have used SVs to demonstrate ideal practices and few are available where innovation in the video production was used, such as comparing normal and abnormal musculoskeletal examination findings [11] and demonstrating errors in the cavity preparation and restoration examination [10].

This paper describes the production process of high-quality and well-produced SVs for medication administration fundamental skills aimed at undergraduate nursing students at a public university in Jordan. The final videos illustrated the ideal performance of medication administration in the skill laboratory as demonstrated by the instructors who were teaching the course, and also included a demonstration of the procedures by registered nurses for real patients in hospital settings. The latter helped students differentiate between the ideal "lab-based" practice and real-world practice, an exercise that will help facilitate practice transition for the nursing students. This report also focuses on the ethical and cultural issues in producing this type of learning resource for educational purposes.

1.1. Background and planning

In almost all schools of nursing, Fundamentals of Nursing Skills is the first clinical course offered for the undergraduate nursing students in the first year of the program. Students usually encounter their first clinical skills training in a laboratory-based environment to prepare them for the subsequent hospital-based rotations. Fundamental skills include maintaining a safe environment (hand washing, infection control, surgical dressing, vital signs); personal cleansing and dressing (changing linens on an occupied bed, disposal of linens, assisting individuals with bathing); medication administration, intravenous (IV) therapy and parenteral nutrition; urinary catheterization; administration of oxygen therapy; and enteral feedings such as placement and maintaining of a nasogastric tube. In addition to the psychomotor skills, the course also focuses on patient–provider communication, critical thinking and problem solving, and documentation of care.

At the School of Nursing where these SVs were produced, the fundamentals of nursing skills course is usually taught by 15 baccalaureate and master-prepared nursing clinical instructors using demonstration and practice techniques on non-interactive mannequins to groups of 8–12 students in each lab session, for a total number of 130–150 students. The disadvantages of this method of teaching include: a limited lab time for students to practice the procedures after the demonstration, which also affects applying skills such as critical thinking, problem solving and documentation of the procedures; the unavailability of other learning resources for skill demonstration; a lack of consistency in skill demonstration between the instructors; not considering the different learning styles of the students; missing equipment from the lab for the demonstration purposes; and difficulty transition to real-patient setting. Therefore, SVs were introduced as supplementary learning experiences to maximize student learning.

The researcher who was an expert in coordinating the fundamentals course and in informatics recognized the need for integrating information technology and multimedia innovations to transform the teaching/learning experience of the fundamentals of nursing course. The project was approved by the curriculum development committee and the faculty involved in teaching and coordinating the course. An executive committee was formed that was responsible for addressing the value and feasibility of integrating SVs into the course and the process of producing, disseminating and evaluating the application, as well as selecting procedures for the SVs pilot based on the available funding. Procedures suggested as the most challenging for students were medication administration, surgical dressings, and urinary catheterization. Since we intended to videotape the procedures in the lab and in a hospital with real patients, we excluded urinary catheterization for cultural issues, because in a conservative society such as Jordan it is extremely unlikely that we could obtain a patient consent on such a procedure for educational purposes. Based on the available funds and since medication safety is a priority [15], we selected the medication administration procedures. The medication administration skills included eight skills for administering oral, nasal, ocular, ophthalmic, IV, intramuscular, intradermal and subcutaneous medications.