

UTILISATION DE MATERIEL VIDEO COMME OUTIL PEDAGOGIQUE AU SEIN DE LA FORMATION DES INFIRMIERES ET INFIRMIERS PERIOPERATOIRES : ANALYSE DOCUMENTAIRE

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RESUME

Cette analyse documentaire examine l'utilisation de matériel vidéo en tant qu'outil pédagogique lors de la formation d'infirmières et infirmiers périopératoires. L'objectif de cette analyse est de déterminer quelles applications vidéo peuvent être intégrées à la formation périopératoire. Le modèle d'apprentissage par expérience de Kolb, suivant lequel les connaissances sont acquises en transformant ses expériences en nouvelles manières de penser et de se comporter, sert de cadre théorique pour l'analyse des documents pertinents. Les articles sélectionnés ont été identifiés par le biais des moteurs de recherche suivants : CINAHL, ERIC et PSYCH INFO. De plus, certains articles ont été reçus d'experts dans le domaine clinique. Les articles analysés se divisent en trois catégories : l'utilisation de matériel vidéo pour démontrer un contenu; l'utilisation de matériel vidéo pour l'autoévaluation; et l'intégration de matériel vidéo au sein de programmes de formation multimédia.

THE USE OF VIDEO AS A PEDAGOGIC TOOL FOR THE TRAINING OF PERIOPERATIVE NURSES: A LITERATURE REVIEW

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ABSTRACT

This review of the literature considers the use of video as a pedagogic tool (teaching instrument) for the training of new perioperative nurses. The literature review seeks to address the question of which usage of the video medium can be integrated into the education of new OR nurses. Kolb's model of experiential learning, whereby knowledge is acquired by transforming experience into new ways of thinking and behaviours, is the theoretical framework used to analyze the pertinent literature. The selected



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articles were obtained from the following search engines: CINAHL, ERIC and PSYCH INFO. In addition, articles were obtained from experts in the clinical field. The reviewed literature can be classified into three main categories: the use of video to demonstrate content; the use of video for self-analysis; and the integration of video in to multimedia teaching programs.

Introduction

Recent high rates of retirement among experienced nurses has contributed to a staffing shortage in both general and specialized nursing. The major impact of this shortage is being felt in the specialties with the highest levels of stress and where the most training is required. These areas include the intensive care, the labour and delivery room, and the operating room¹. The training of new nurses in to the OR takes, on average, one year and involves a significant investment of time and money.

These in-house, and informal, orientation programs are a factor that Craven and Boyle² have identified as a cause of staff turnover, burn out, and dissatisfaction. Because the new nurse's orientation takes place entirely in the operating theatre, her exposure to the surgery varies depending on the scheduled cases. The use of video in a formal orientation program is discussed in this article as an advantageous option for offering a broad and standardized content to the new nurses in the operating room.

This article is a systematic literature review on the use of video as a pedagogic tool for the training of nurses in the operating room. Kolb's model of experiential learning was chosen to direct the analysis of the literature. Kolb explains experiential learning as based on a personal and concrete experience of the learner. Learning occurs through a critical reflection on a particular experience and requires the active participation of the learner to transform his/her experience into knowledge^{3,4}. The structure of the experiential model makes it possible to study and strengthen the links between education, work and personal development. It is also a cognitive, emotive, and behavioural process resulting in a living experience rather than just the knowledge of facts^{3,4}.



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Kolb's Model

Kolb's model is simple and dynamic. It describes the experiential adult learning process in four cyclical phases: concrete experience, reflective observation, abstract conceptualization and active experimentation.

This model can be illustrated with the elements of a typical OR orientation. When the new nurse is sent to an operating theatre to observe the procedure and the role of the nurses and becomes actively involved in the scrub role by double scrubbing, or interacts with the circulating nurse on various aspects of patient care, this would be a concrete experience (CE) in the cycle of learning (fig 1). Upon leaving the theatre, the new nurse will meet the clinical educator and discuss her experience. This discussion should lead to reflection, by the new nurse, on her perception of the role based on her interactions in the operating room, defined in the model as reflective observation (RO). At this point, the new nurse could be presented with the theoretical concepts, for example aseptic technique or principles of electrocautery and link them to what she has already observed by using abstract conceptualization (AC). From there, she would be able to develop her own explanation (concept or model) to be tested in the active experimentation (AE).

The four phases of Kolb's cycle are located on two continuums: apprehension that occurs

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when the individual participates in actual experience (the learner needs to touch and actually do in order to understand) and comprehension that happens outside of the context of actual experience (i.e. the learner reading an instruction manual before manipulating a machine, learning in a classroom lecture environment, or studying a text book).

Kolb identified four learning styles: converging (the learner favours abstract conceptualization and active experimentation); diverging (the learner prefers concrete experience and reflective observation); assimilating (choosing reflective observation and abstract conceptualization); and accommodating (whereby the learner will prefer concrete experience and active experimentation)^{3,5,6}. The preferred learning style of an individual is influenced by his/her hereditary background, previous experience, and the demands of the environment. The pedagogic tools (such as case studies, observation grids, simulations, and video) when used within an experiential framework will enable the simulation of specific situations and help create personal experiences for the learner.

Literature Review

The search engines CINAHL, ERIC, PSYCH INFO as well as the publication search of Association of periOperative Registered Nurses (AORN) website were used to gather articles on the use of video as a pedagogic tool for the time period of 1995 to 2005. Only one article was found on the use of video in the operating room setting and so the search was broadened to nursing academic education and nursing continuous education. Using the keywords nursing, audiovisual, video, nurse education, and multimedia in various combinations, 492 articles were discovered and twelve were selected for this literary review. The inclusion criteria for the selected articles were nursing education, availability, and language (either English or French). Of the excluded articles many studied the use of video for patient education. No articles were found discussing the usage of video as a pedagogic tool within the 1995 to 2005 time frame. Seven more articles and publications were chosen from the reference lists of the selected articles from an earlier date.

Experts in the field of perioperative nursing and education were also consulted.

Three themes emerged from the selected articles: the use of video to demonstrate content, the use of video as a self-analysis tool, and the integration of video in multimedia teaching programs.

The Use of Video to Demonstrate Content

Shortly after video cameras were invented in 1956, academic settings predicted a major upheaval in education, even forecasting the disappearance of teachers and the domination of video. But it did not happen. The height of popularity of video was reached in the 1980s and most publications on the topic are from this decade⁷.

Meeker⁸ presents the experience of a Louisiana center using video and closed circuit television to provide continuous education to nursing staff. The flexibility of access by staff on all shifts, as well as the savings resulting from the elimination of costly workshops and a decline in staff replacement made this project successful. Unfortunately, the effectiveness of video as a pedagogic tool was not measured. Can you give timelines of this project – the wording project implies it was short term and had a start and finish date. When did it start and is it ongoing?

In the nursing schools, in the 1980s, the use of video was superficial and seemed to be rejected by nursing teachers⁷. This could be explained by several beliefs that govern the choice of teaching strategies and that resulted in a higher value being placed on face-to-face communication, over technological substitutes, at the time^{9,10,11}. The single focus approach of the time denied the benefit of a multi modal educational methodology and dismissed the individual, and varied, needs of the learners. Teachers also perceived their profession as an art form and did not see a need for the science and technology of video⁷. Other considerations in the apparent lack of popularity of video are the absence of significant differences, as perceived by the students, in learning achieved through filmed presentations versus live presentations. It was felt that video was developed primarily for purposes other than education. Although the medium has obvious advantages, including the opportunity to

view the images, as a group or individual, many times and at different speeds, it did not fully replace the student's involvement in an actual maneuver – video alone could not fully replace the real setting. The cost of equipment and the expertise necessary to develop programs could also have contributed to its lack of popularity⁷.

In the 1990s, a study described the frequency of use of video cameras within a college nursing department¹². Only 3% of the teachers used video cameras, to film and play for the class, more than 6 times a year. The absence of technical abilities and a lack of familiarity with the equipment were given as explanations by the teachers surveyed. They could not readily think of pedagogic applications for the equipment.

Video was used more intensively in European academic systems and Mottet analyses the phenomenon of video-formation that lead to a collective research action (also known as intervention research) in the school system¹³. This type of research looks at the effectiveness of an intervention in the natural setting with the researcher also being one of the participants.

In 2000 Lai¹⁴ published the results of an experimental study demonstrating the learning advantages of using dynamic visual information combined with audio. This experiment was based on the Paivio¹⁵ dual coding theory that assumes that memory and cognition are served by two separate symbolic systems – verbal information and visual images.

The Use of Video for Self-analysis

There are two trends among the articles discussing the use of video as a reflective tool. They are self-analysis of cognitive abilities, such as communication skills¹⁶, or self-analysis of psychomotor abilities (muscular movement that is a direct result of mental activity)¹⁷. In both areas an observation tool is necessary to guide the learner and provide opportunities for reflection. This application of video is currently being used in the skill lab of an operating room formation program to assist with the acquisition of psychomotor skills. Graling and Rusynko¹⁷ maintain that being filmed while performing a skill introduces a level of stress that can be beneficial to



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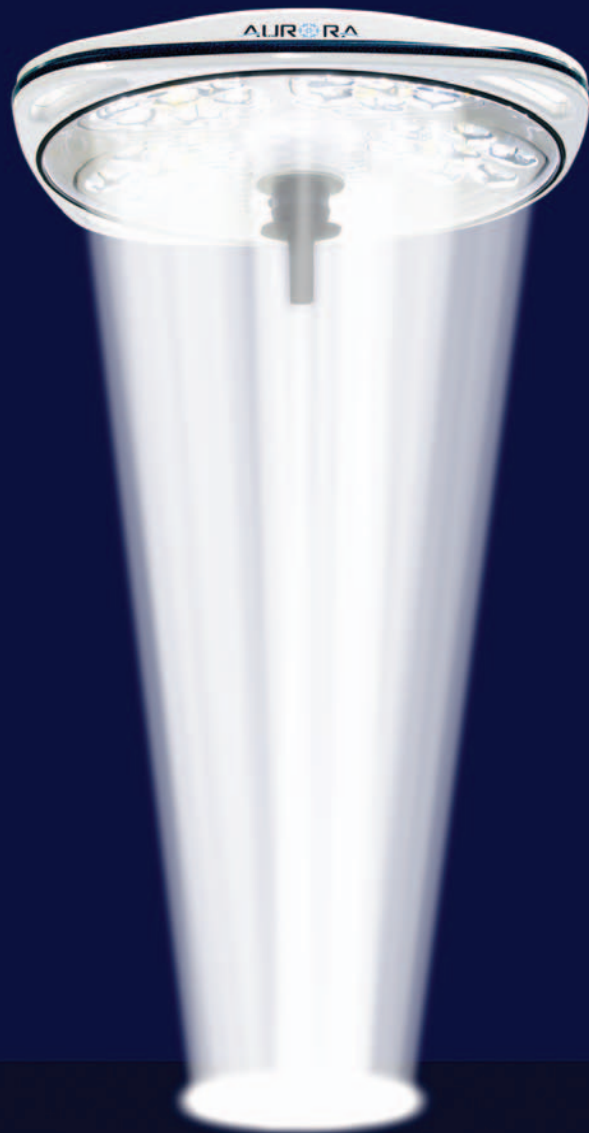
the learner by giving them an opportunity to learn to deal with a stress level similar to that of real life while still in the relative comfort of the skill lab.

The Use of Video in Multimedia Teaching Programs

In the last 20 years, technology has been increasingly used in nursing practice and academia. The expectations of a “learning revolution” that were placed upon video in the ‘80s have now been transferred to informatics (the science concerned with gathering, manipulating, storing, retrieving and classifying recorded information) and multimedia (information transmission that combines various communication media such as text, graphics, video, sound etc.). While some studies have shown that computer-assisted programs are an effective tool for learning facts and concepts^{18,19}, the actual context of accessibility should be different since technologies are now part of the learner's environment. Most students are familiar with computers and use Internet, which was not the case of the preceding generation²⁰.

When planning to use multimedia technologies in teaching programs it is important to evaluate the pertinence of the program prior to the utilization. Criteria have been established to guide the user in assessing such programs and it is recommended that the user evaluate and classify the nursing programs available on CD-ROM and websites^{21,22}. The multimedia technologies can be integrated into a teaching program as a topic, a communication mode or

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as a pedagogic tool. It is important to note that using them does not in itself guarantee learning. They must carry an adequate pedagogic content²³. Multimedia can facilitate the collaboration between students and teachers as well as stimulate reflection and problem resolution²⁴. In the hospital setting, a potential use for multimedia programs is for general orientation of new employees. The advantages are seen as reducing the demands placed on the clinical educators, offering flexibility in the timing and place of the formation and an increase in time devoted to direct patient care. Barriers are perceived in the initial investment necessary for computer equipment, the few programs available in health care, and the lack of technical support and related expertise within the teaching institutions²⁵.

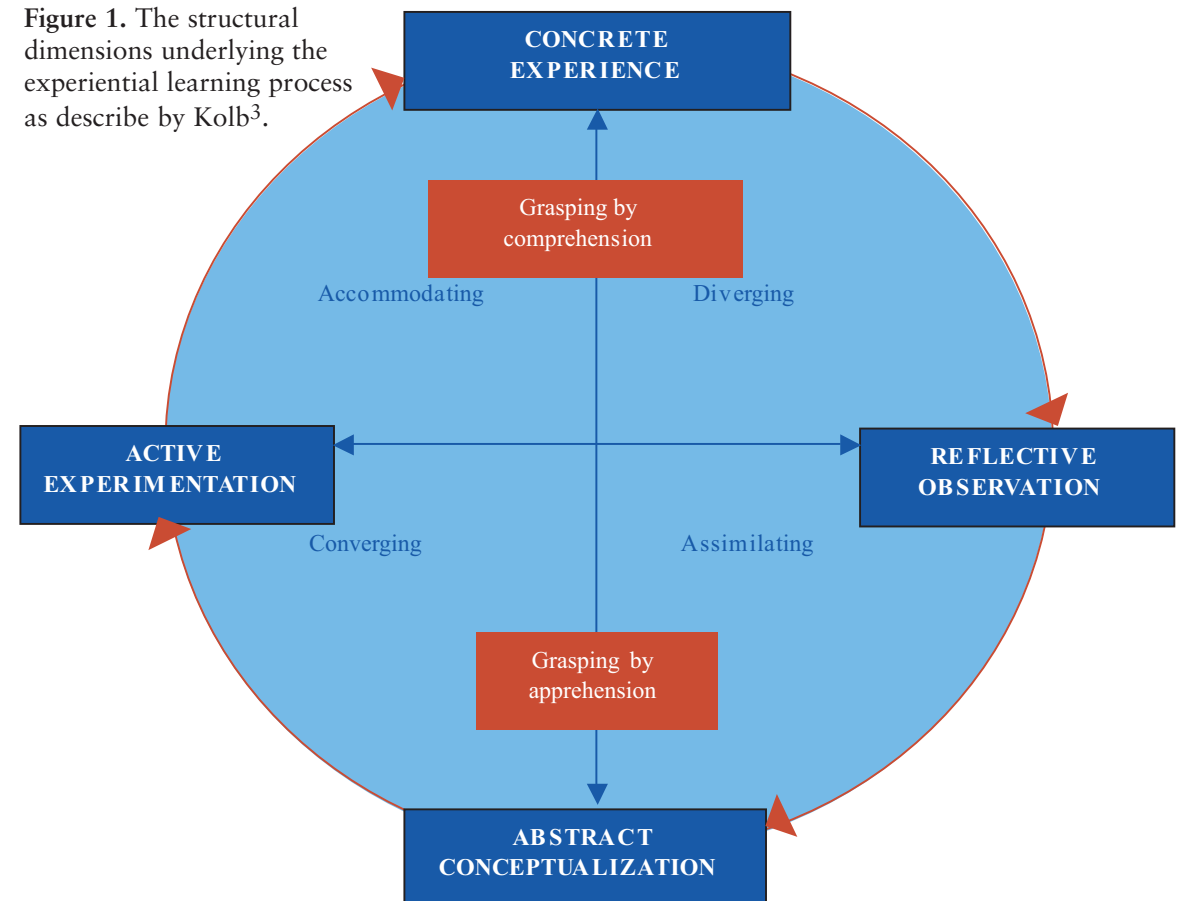
Three concrete applications have emerged among the literature on the use of multimedia.

They are interactive video, distance education, and simulation.

Interactive Video

Interactive video is presented as a technology that requires the active participation of the learner and offers a simulation with a high degree of transferability towards reality. It is possible to represent the reality on film and, as a result, the knowledge acquired can be used in the real clinical setting. Ward recommends using a program created specifically for nursing rather than adapting another discipline's program²¹. Very few example of nursing programs are found in the literature; amongst them there is a cardio-pulmonary resuscitation program on CD-Rom, developed by Moule, Gilbert & Chalk²⁶. The authors explain in details the process of realizing their project, from content determination to filming, including the addition of a pre-test and post-test for the learner. The availability of

Figure 1. The structural dimensions underlying the experiential learning process as describe by Kolb³.



digital video camera makes it easier to insert video streaming segments in to programs, web sites and digital audiovisual presentations¹⁹.

Distance Education

Online education in nursing is progressively more available and it increases the accessibility to courses and the number of students. At the Faculty of Nursing of Université de Montréal, a research project was done when the same course, Health Assessment in Emergency Situations was offered both on-line and in a classroom setting. The web version used video to teach the health assessment that was traditionally demonstrated in skill labs. The study was conducted on the satisfaction of the students and success rates were compared and found to be similar²⁷.

Simulation

In simulations, video images occupy an important place in representing a realistic environment during the teaching process. The objective of a simulation is to reproduce an acute, or infrequent, situation with no risk to actual patients. It can also become a simplified model whereby interactions of filmed real events can be emphasized by the filming technique such as enlarging, focusing or slowing down the image^{28,29}.

A study was conducted in order to determine the skills that nurses in critical care, Emergency Room (ER), and anesthesia perceived to be difficult to learn and where nurses could benefit from a video simulation. They were also asked about their perception of the usefulness of the simulation. The advantages identified by the nurses of the simulation technology were the possibility of representing a vast array of interventions, their process and consequences. Simulations were also identified as an opportunity to improve the performance of complex procedures²⁸. The nursing faculties perceive simulations as an alternative to traditional teaching methods that decrease the need for teacher hours and can also be integrated in to distance education programs²⁹.

A simulation program was produced in 2001 using digitalized video images, and titled "The clinical decision simulator"²⁹. This tutorial combines

filmed images of clinical situations and an animated tutor giving feedback to the learner after a decision has been made. For example, after the student assesses a patient and decides which interventions are necessary, the simulator will point out interventions that she did not use, their impact, which of her actions were right in the circumstances, and the rationale behind each option. This type of program is complex, is costly, requires computer expertise, and is mostly being produced at the experimental level. It is difficult to produce such a program in the clinical or academic setting and usually requires the use of external computer firms to program the content of a simulation that has been developed internally²⁹. The simulations that are currently being developed and commercialized involve three-dimensional models such as the sim-man mannequin. Those simulation programs have been evaluated in quasi-experimental studies with second year nursing students comparing the skill acquisition of two groups (one group having used the simulation, the other learning without it). In this study, video was used as a self-analysis tool. While the use of the simulation improved learning significantly it did not change the confidence level of the students³⁰.

Discussion

The literature review suggests that video can be used as a pedagogic tool in nursing but it would find its relevance in the operating room mostly within the context of experiential learning (using Kolb's model and Paivio's theory as theoretical frameworks).

When Lai¹⁴ validated Paivio's theory, she demonstrated that students assimilated abstract concepts better when they were presented with dynamic images and sound. Due to video's advantages of offering multiple viewings and the opportunity to rewind and pause the image, it can be perceived as a superior representation of reality and a concrete learning experience for the student^{7,8,13}. As such, video can be used as a demonstration tool for students who favour a diverging learning mode.

When used as a self-analysis tool, video becomes an instrument used to induce reflective observation. The learner revisits his/her performance on video and, through the use of an

evaluation grid, can structure the process of reflection and the integration of concepts. This application can be useful in the training of an OR nurse and in the setting of the skills laboratory.

The most recent articles on this topic discuss the use of multimedia in education, whereby video is a component of the three major themes: interactive video; distance education; and simulation. In some instances, the video image is digitalized and integrated in to an on-line program²⁷ or on to a CD-ROM²⁶ where the learner is an observer and integrates the concepts by observing and reflecting. This would be quite different than the use of a simulation or an interactive video where the learner becomes an active participant and lives a concrete experience as describe by Kolb³.

A learner whose dominating learning mode is diverging, or assimilating, could benefit from using video as a concrete experience, during a simulation, or as a reflective observation tool. A learner whose dominating learning mode is convergent, or accommodating, will prefer the active experimentation. They would not benefit as much from the use of video since their integration of concepts would occur during the experimentation. Fortunately, active experimentation is already an obligatory component of the operating room formation and therefore tools are in place to appeal to learners who respond better to that form of learning. The addition of video would help appeal to the other style of learner.

Many authors cited by Garrett & Callear²⁹ doubt the efficacy of video in education and justify it by the lack of studies comparing video or multimedia with traditional teaching methods. AORN's clinical education department has been producing perioperative teaching videos since 1987, but has not conducted any studies in to the efficacy of, and value of, video as a pedagogic tool. In order for a change to occur in the culture surrounding video in education it will be important to obtain empiric results proving the pedagogic value of video and multimedia.

The literature reviewed offers no recommendations for the making of a specifically perioperative teaching video but some of the general suggestions

can be applied to the perioperative setting. Initially, the clinical experts of the setting and the novice nurses, as potential users, should be consulted to determine the concepts and techniques where it is difficult to acquire actual workplace experience and for which a video representation would be advantageous^{28,31}. Following this process, the content should be validated and a script and storyboard developed²⁶. Participation by the audiovisual department of the institution would help with the feasibility of the project.

The use of video as a tool for self-analysis could also prove very enriching in the acquisition of specific skills to the different surgical specialties in a skills lab¹⁷. But the use of a teaching video does not, in itself, guarantee a faster and more complete training. Video needs to be integrated in to an educational program where the role of the clinical educator and the preceptor assures this experiential learning approach.

Conclusion

A video educational program for perioperative nursing, based on Kolb's experiential learning framework and Paivio's theory, could contribute to a training program for operating room nurses. Video appears to be an interesting medium to demonstrate the reality, and thus the details of surgical procedure, as well as the use of equipment and instruments. Once introduced as part of a training program in the operating room, further research, in a comparative or experimental study in measuring learning and staff satisfaction, would be of interest.

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ENTEROCOQUES RESISTANTS A LA VANCOMYCINE ET LE ROLE DU TRAVAILLEUR DE SANTE

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RESUME

Depuis la dernière décennie, la croissance de la résistance aux antibiotiques est fulgurante, et la propagation de souches résistantes aux antibiotiques est maintenant devenue une menace dans les hôpitaux. Les entérocoques résistants à la vancomycine (ERV) se sont révélés une de ces souches. Le ERV est un micro-organisme robuste capable de survivre longtemps sur les surfaces. Ils sont rapidement transmis de patient à patient par le contact avec les travailleurs de santé. Cette souche peut croître le taux de mortalité des patients dont le système immunitaire est affaibli. Les travailleurs de santé dans les hôpitaux ont un rôle primordial à jouer dans la prévention et le contrôle du ERV. Se laver fréquemment les mains en employant une bonne technique est une manière efficace de prévenir et à contrôler la propagation du ERV. Fournir une formation et des ressources aux travailleurs de santé est aussi un facteur important. La théorie des croyances aide à expliquer comment approcher et appliquer les changements à la pratique.

VANCOMYCIN-RESISTANT ENTEROCOCCI (VRE) AND THE ROLE OF THE HEALTHCARE WORKER

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ABSTRACT

Antibiotic resistance has increased dramatically within the last decade. The spread of antibiotic resistant strains of bacteria has become a threat within hospitals. Vancomycin-resistant enterococci (VRE) has emerged as one of these strains. VRE is a robust microorganism and can survive for long periods of time on environmental surfaces. VRE spreads quickly from patient to patient through contact with health care workers. This strain can increase the mortality rate in immuno-compromised patients. Hospital health care workers have an important role to play in the prevention and control of VRE. Proper, and frequent, hand-washing significantly contribute to preventing and controlling the spread of VRE. Providing health care workers with education and resources is also a key factor. The health belief model helps to explain how to approach and implement changes to practice.

There has been a dramatic increase in antibiotic resistance in the last decade and, as a result, the control of infectious diseases has become a major challenge. Antibiotic resistance is one of the most dangerous threats to the treatment of infectious diseases¹. It has been estimated that thirty to forty percent of endemic institutional antibiotic resistance is caused by the unwashed hands of hospital personnel². One of these antibiotic resistant strains of bacteria is vancomycin-resistant enterococci (VRE). The first isolated incident of VRE was detected in Canada in 1993, with the first outbreak in 1995³. VRE has developed into an important nosocomial pathogen and is linked both with mortality and the potential to transfer resistance to other virulent bacteria⁴. Health care workers, especially operating room nurses, recovery room nurses and the surgical floor nurses can play an integral part in the control and prevention of VRE.

In order to understand how to prevent the spread of VRE, and how to control it once it has been detected on a fomite surface in a hospital, it is necessary to further examine the role of health care workers in the transmission of infection. This article will discuss recommendations and barriers to maintaining patient safety when