

THE EFFECTIVENESS OF COMPUTER-ASSISTED INSTRUCTION AS A
STRATEGY FOR HIV/AIDS EDUCATION AND TRAINING FOR
HEALTH CARE PROFESSIONALS

A DISSERTATION

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COLLEGE OF HEALTH SCIENCES

BY

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ABSTRACT

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THE EFFECTIVENESS OF COMPUTER-ASSISTED INSTRUCTION AS A STRATEGY FOR HIV/AIDS EDUCATION & TRAINING FOR HEALTH CARE PROFESSIONALS

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HIV/AIDS remains as one of the leading public health concerns worldwide for over two decades. With the rising numbers of individuals diagnosed with this disease, healthcare professionals are being impacted in their daily practice. Thus, an educational self-study CD-ROM on “HIV/AIDS Prevention, Early Intervention, and Health Promotion” was developed by the Mountain Plains AIDS & Education Training Center.

To evaluate the effectiveness of this educational CD-ROM program, 221 health care professionals were recruited from 106 different zip codes to participate in an evaluation research study. A quasi-experimental pretest posttest design was utilized to measure changes in healthcare professionals’ knowledge and perceived self-efficacy to care for people living with HIV after reviewing an educational CD-ROM. The secondary purpose was to evaluate the effectiveness of computer - assisted instruction (CAI) as a HIV/AIDS strategy to educate healthcare professionals seeking continuing education. The social cognitive theory concept of perceived self-efficacy provides a theoretical framework for connecting knowledge with healthcare professionals’ confidence in and

perception of capabilities to care for people living with HIV and identifying individuals at risk for HIV.

The results of the program evaluation showed this educational CD-ROM program to be an effective strategy to increase HIV/AIDS knowledge. This study also demonstrates increased perceived self-efficacy to care for people living with HIV/AIDS in a group of healthcare professionals. The findings of this study are favorable for the usage of CAI as an effective strategy to educate and train healthcare professionals on the topic of HIV/AIDS.

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CHAPTER I

INTRODUCTION

A mere 25 years ago, the concepts of Human Immunodeficiency Virus (HIV) and Acquired Immune Deficiency Syndrome (AIDS) were not even a part of healthcare professionals' vocabularies. Yet, as of the 1990s, these terms have become common household words, and these diseases are leading public health concerns worldwide. The Joint United Nations Programme on HIV/AIDS (UNAIDS) estimates that over 40 million people worldwide are living with HIV/AIDS (UNAIDS, 2004). Of those 40 million individuals, approximately 37 million are adults, and 18 million of those adults are women. These statistics are even more concerning because the numbers of individuals affected by HIV/AIDS continue to increase. For instance, in 2004, it is estimated that 4.9 million individuals worldwide were newly infected with HIV/AIDS (UNAIDS, 2004).

In addition, the younger population ranging from ages 15 to 24 years old is significantly affected by this health problem. It is reported that 32%, or 12.1 million, of the HIV/AIDS population are youth (Kaiser Family Foundation, 2004a). The Centers for Disease Control and Prevention (CDC) cites that men who are having sex with men in the minority population also have a high risk for HIV infection (CDC, 2005a).

According to the CDC, the total number of AIDS cases in the United States has risen from 816,000 in 2001 to 1,039,000 in 2003 (CDC, 2002a & 2005b). It is estimated

that approximately 40,000 people in this country are infected yearly with HIV. The number of new cases poses numerous problems for healthcare professionals, because approximately 25% of people infected with HIV are unaware of their status. Furthermore, there are as many as 42% to 59% of individuals living with HIV/AIDS who are not receiving HIV related healthcare services (Kaiser Family Foundation, 2004b).

Of the 3 million deaths caused by AIDS in 2001, 1 million were women, which illustrates the astronomical growth in the female population of those living and dying with HIV/AIDS (UNAIDS, 2002). The number of women infected with HIV/AIDS has consistently increased over the past 20 years, with an overwhelming jump from 8% in 1985 to 27% in 2003. In 2001, the number of females with a diagnosis of HIV/AIDS was 141,048, while the number of males diagnosed with HIV/AIDS was 666,026. Fourteen percent of people living with AIDS in 1992 were women, whereas in 2003 that percentage grew to 22% (CDC, 2002b & 2004).

Women of color (African American and Hispanic/Latina) are disproportionately represented in the number of HIV/AIDS cases reported among women. African American women represent 13% of the female population in the United States, but they account for approximately 67% of the women living with AIDS. Unfortunately, the statistics are similar in the Latino population, with this group of women representing 13% of the female population and 16% of the estimated AIDS population, and (Kaiser Family Foundation, 2004c).

The death rates associated with HIV/AIDS continued to steadily rise in the early 1990s, then started to dramatically decrease in the mid- to late 1990s. This decrease is attributed to the initiation of new pharmacological treatment regimens. However, the number of people diagnosed with HIV/AIDS has increased by 4% from 1999 to 2003 (CDC, 2005b).

Clearly, such staggering statistics are a public health concern. Healthcare professionals are in a position to play a major role in the prevention, early intervention, diagnosis, and treatment of HIV/AIDS. Studies demonstrate the positive outcomes associated with healthcare professionals that are HIV experienced. These benefits and outcomes have been marked by the increased survival, decreased mortality, and better access to healthcare for people living with HIV (Kitahata, Koepsell, Deyo, Maxwell, & Dodge, 1996; Markson, Houchens, Fanning, & Turner, 1998). With the rapid increase in the number of individuals diagnosed with HIV/AIDS, and the ever changing guidelines for medication and treatment, it is imperative for healthcare professionals to keep pace with this information.

Rationale for continuing education for healthcare providers

In order for healthcare professionals to be confident and competent to assess individuals at risk for HIV/AIDS, education and training is necessary. Some of the current strategies for continuing education include lectures, conferences, and peer-provided in-service education presentations. However, the utilization and incorporation of computer assisted instruction (CAI) for continuing medical education (CME) has

become more popular over the past few years. According to Wutoh, Boren, and Balas (2004), physicians' usage of the Internet for CME increased from about 3% to more than 30% from 2001 to 2004. However, the research about trends, utilization, and effectiveness of CAI for HIV/AIDS education and training is limited (Wutoh et al., 2004).

To meet the needs of healthcare professionals that care for patients diagnosed with HIV/AIDS, AIDS Education & Training Centers (AETCs) have been created. The Centers are a group of education and training programs funded by the United States Department of Health and Human Services', Health Resources and Services Administration (HRSA). The purpose of the national AETC is to improve the care of people living with HIV/AIDS by supporting state of the art clinical consultation, education, and training for clinicians serving this population. There are more than 70 AETC sites in conjunction with 11 regional centers that serve 50 states, the District of Columbia, the Virgin Islands, Puerto Rico, and the six U.S. Pacific Jurisdictions (U.S. Department of Health & Human Services, 2004).

The aim of the AETCs is to provide resources and to train healthcare providers that serve the unique problems and special needs presented by people living with HIV. The goal of the program is to increase and strengthen the knowledge/awareness of healthcare professionals who care for people living with HIV. Specific aspects of this education and training include counseling, diagnosing, treating, and providing HIV care to infected individuals. Most recently, the concept of primary prevention of HIV/AIDS

has been embraced and added to the scope of the AETCs (U.S. Department of Health & Human Services, 2004).

The AETCs concentrate on training healthcare providers; specifically, physicians, physician assistants, registered nurses, nurse practitioners, dentists, and pharmacists to care for the HIV/AIDS population. Furthermore, they target those healthcare providers that serve incarcerated persons, minorities, homeless, rural communities, Ryan White CARE Act-funded sites and other populations that are disproportionately affected by HIV. These education and training programs provide clinicians with a unique sense of competence regarding HIV, and enthusiasm to treat people living with this chronic illness (U.S. Department of Health & Human Services, 2004).

The reason for educating and training healthcare professionals is clear and simple. With the rising numbers of individuals diagnosed with this HIV/AIDS, more healthcare professionals are going to be impacted with this population of patients in their daily practice. Therefore, the healthcare professional who has been educated and trained in this specialty is the prepared professional.

Statement of the Purpose

The primary purpose of this research study was to evaluate the effectiveness of the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” educational CD- ROM product, a self-study module designed and developed by the Mountain Plains AETC (MPAETC). The Accreditation Council for Continuing Medical Education (ACCME) and the University of Colorado (UC) School of Medicine collaborated on this continuing

education project. The secondary purpose was to evaluate effectiveness of Computer Assisted Instruction (CAI) as a HIV/AIDS training strategy to educate health care professionals seeking continuing education.

Research Questions

The following research questions were addressed in this study:

1. Is Computer Assisted Instruction (CAI) an effective strategy among healthcare professionals to gain knowledge on the topic of HIV/AIDS?
2. Is gain of knowledge different for participants of various healthcare professional job functions, employment settings, work locations, gender, ethnicity, and HIV+ patient volume?
3. Will healthcare professionals have a statistically significant difference in perceived self-efficacy to care for people living with HIV after completing the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” CAI program?
4. Will the participants’ perceived self-efficacy to utilize a CAI CD-ROM approach for continuing education change after the completion of the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” CAI program?
5. What is the level of satisfaction among the participants using this CAI strategy as a method to obtain continuing education?

Delimitations

For this study, the following delimitations were identified:

1. This educational strategy was limited to healthcare professionals who have access to a computer and have at least minimal computer navigational skills.
2. The study was limited to participants with access to a computer with adequate specifications and software for the CD-ROM to run.
3. The sample of participants was limited to healthcare professionals who read and comprehend the written English language, because the CD-ROM is an English-version only.
4. The participants were registered nurses, advanced practice nurses, physicians, and physician assistants.

Limitations

For this study, the following limitations were identified:

1. The participants were selected from a convenience sample of healthcare professionals located in the United States.
2. Participation was limited to registered nurses, advanced practice nurses, physicians, and physician assistants; therefore, results may not be generalizable to the other healthcare professionals served by the AETC.
3. This study relied upon the honesty of participants in responding to the survey questions. In an effort to overcome this limitation, participants were assured anonymity and the researcher was blind to any identifying information.

Assumptions

The researcher made the following assumptions:

1. The participants were actually licensed healthcare professionals in the categories described above.
2. The licensed healthcare professionals actually reviewed and completed the CD-ROM.
3. The licensed healthcare professionals who actually completed the CD-ROM were the same persons submitting the survey.

Definition of the Terms

For the purpose of this study, the following definitions of terms apply:

Accreditation – “A decision by the ACCME, or a recognized state medical society, that an organization has met requirements for a CME provider as outlined by the ACCME. The standard term accreditation is four years” (ACCME, 2000, p. 1).

Accreditation Council for Continuing Medical Education (ACCME) – “The ACCME has two major functions: the accreditation of providers whose CME activities attract a national audience and the recognition of state or territorial medical societies to accredit providers whose audiences for its CME activities are primarily from that state/territory and contiguous states/territories” (ACCME, 2000, p. 1).

Aesthetics – The participant’s sense or perception and appreciation for the appearance, graphics, images, and colors of the CD-ROM.

AIDS – Acquired immunodeficiency syndrome. *Acquired* – “The disease is not hereditary but develops after birth from contact with a disease causing agent (in this case, HIV).” *Immunodeficiency* – “The disease is characterized by a weakening of the immune system.” *Syndrome* – “A group of symptoms that collectively indicate or

characterize a disease. In the case of AIDS this can include the development of certain infections and/or cancers, as well as a decrease in the number of certain cells [CD4+ less than 200] in a person's immune system." (CDC, 2003a)

Competency – "The application of knowledge and the interpersonal, decision-making and psychomotor skills expected for the practice role, within the context of public health" (National Council of State Boards of Nursing, 2005, p. 1).

Computer Assisted Instruction (CAI) – The process of using the computer, internet, compact disk read-only media CD-ROM, electronic learning or any other distance learning technology to enhance knowledge and professional growth (Curran, Hoekman, Gulliver, Landells & Hatcher, 2000, p. 106). This term is also referred to as computer mediated instruction, computer based instruction, and computer assisted learning.

Contact Hour – "A unit of measurement that describes 50 minutes on an organized learning activity, which is either didactic or clinical experience" (DeSilets, 1998, p. 208).

Continuing Education (CE) – The procedure of increasing knowledge that healthcare professionals go through to stay up to date with the latest developments in their practice, to provide better patient care (Mamary & Charles, 2000).

Continuing Education Unit (CEU) – "A specific standard (10 contact hours) of educational achievement used by many universities and professional organizations under the criteria of the International Association for Continuing

Education and Training (IACET) to attest to clock hour completion of continuing education activities” (DeSilets, 1998, p. 208).

Continuing Medical Education (CME) – “Continuing medical education of educational activities which serve to maintain, develop, or increase the knowledge, skills, and professional performance and relationships that a physician uses to provide services for patients, the public, or the profession” (ACCME, 2000, p. 3).

Continuing Nursing Education (CNE) – “Those professional experiences designed to enrich nurses’ contribution to health care” DeSilets, 1998, p. 208)

Cultural appropriateness – The process of acknowledging and respecting different cultural traditions and beliefs in the presentation of the educational program CD-ROM (Huff & Kline, 1999).

Format – The arrangement and layout design of the CD-ROM.

HIV – Human immunodeficiency virus is the virus that causes AIDS. “This virus may be passed from one person to another when infected blood, semen, or vaginal secretions come in contact with an uninfected person’s broken skin or mucous membranes.” (CDC, 2003b)

Hybrid Delivery System – “A system that merges Web documents, multimedia, computer-mediated communication, and CD-ROMs to enable self-paced instruction and collaborative learning” (Curran, Hoekman, Gulliver, Landells, & Hatcher, 2000, p. 106).

Perceived Self-Efficacy – “People’s beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives.

Self-efficacy beliefs determine how people feel, think, motivate themselves and behave” (Bandura, 1994, p. 1).

Utility – The participants’ level of satisfaction for the CD-ROM product performance in regard to effectiveness, usefulness, function, operation, and helpfulness.

Importance of the Study

Computer Assisted Instruction has become a highly utilized strategy for the education of health care professionals in our technology-driven society. CAI also accommodates the need for flexibility in the busy lives of medical professionals. Unfortunately, the rates of people with HIV/AIDS are rising at an alarming speed. Thus, healthcare professionals are obliged to become knowledgeable regarding people at risk, screening and testing policies, treatment modalities and, perhaps most importantly, prevention strategies. This research study evaluated the effectiveness of an educational CD-ROM as a strategy to meet healthcare professionals’ education and training needs in the field of HIV/AIDS.

CHAPTER II

REVIEW OF LITERATURE

The epidemiological rates of Human Immunodeficiency Virus (HIV) and AIDS in the United States are astonishing and are steadily rising. The states that had the highest number of reported cases of AIDS in 2003 were: New York (6,684), California (5,903), Florida (4,666), Texas (3,379), and Georgia (1,907) (CDC, 2005c). The growing prevalence of this illness, along with rapidly changing treatment guidelines and recommendations, creates a need for skilled healthcare providers willing to care for people living with this deadly disease (Huba et al. 2000a; U.S. Department of Health & Human Services, 2004).

There is a debate in the field of HIV care regarding who is, in fact, considered an HIV healthcare provider. Some believe that HIV infected individuals should be cared for by infectious disease specialists, while others think generalist and primary care providers with HIV knowledge and training are the healthcare professionals most appropriate for the care (Landon et al., 2002). Some experts take the controversial position that “there is no defined population of HIV providers” (Liljestrand, 2004, p. 39). This debate has created an issue regarding healthcare professionals’ education, clinical skill, knowledge, and specialty training in the care of people living with HIV. For the purposes of this

literature review, HIV healthcare providers include nurses, advanced practice nurses and nurse practitioners, physicians, and physician assistants.

HIV disease is manifested with opportunistic infections, disorders affecting many organ systems, psychosocial issues, and side effects to the medications. Thus, the healthcare provider involved with the care of people living with HIV/AIDS has a wide span of continuing education needs to be fulfilled (Huba et al., 2000a). This provides an opportunity for health educators to identify effective strategies to educate and train healthcare professionals in the specialty of HIV/AIDS. One strategy to be investigated is computer-assisted instruction (CAI), a form of distance education that healthcare professionals utilize to obtain continuing education.

This chapter will review the literature regarding (a) continuing education and healthcare professionals, (b) continuing education programs for healthcare professionals specifically related to HIV/AIDS, (c) CAI educational programs for healthcare professionals, (d) CAI educational programs for healthcare professionals in the specialty of HIV/AIDS, and (e) self-efficacy, CAI, and the health educator's role in continuing education.

Continuing Education Programs and Healthcare Professionals

Gallagher (1996) states, "It is important to keep in mind that completion of a health profession's basic education program is the beginning, not the end, of the learning that will guide effective practice" (p. 8). Healthcare professionals employ a variety of methods, both traditional and non-traditional, in order to stay updated with the latest

knowledge in their individual areas of specialty. Traditional education strategies consist of conferences, print-based self-study modules, worksite in-services, and teleconferences. Non-traditional continuing educational programs include, but are not limited to, computer assisted, distance education, CD-ROM/Hybrid based education programs, and Web casts (Charles & Mamary, 2002; Suggs et al., 1998). Furthermore, continuing education requirements are complex, with individual issues within each healthcare profession and specialty. It is important to review the history of professional continuing education and competency standards in order to understand the current status of continuing education and continuing medical education.

Continuing Education for Nurses

A debate about competency, accreditation, and continuing education requirements for licensure renewal spans decades. However, the literature consistently documents that the individual nurse holds at least part of the accountability for maintaining competency (Carpenito, 1991a; Carpenito, 1991b; Eustace, 2001; Exstrom, 2001). The nursing profession, nursing educators, employers, and the nursing boards also bear some responsibility. Other issues related to nurses obtaining continuing education are finances, time off work, specialty area, and travel (Eustace, L., 2001, Exstrom, S., 2001).

Columbia University was the first institution to provide a formal continuing education program, beginning in 1899. The American Nurses Association advocated for mandatory continuing education for relicensure in 1973, but reversed that decision in 1985, noting that "individual nurses are responsible for determining and evaluation their

learning needs, and for ensuring those continuing education needs are met” (p. 29). In contrast, the National League of Nursing’s position is that “mandatory continuing education is essential to protect the public and ensure that nurses are competent” (Carpenito, 1991a, p. 29). Davee & McHugh (1995) report the first States to pass legislation requiring continuing education for relicensure were California and Kansas, in 1978 (as cited in Eustace, 2001).

Advanced practice nurses (APNs) must first be licensed as a registered nurse (RN) by the board of nursing in the state in which they practice. Beyond that, requirements vary in each state. Furthermore, states vary in their rules regarding requiring or not requiring continuing education units for annual license renewal. In addition to maintaining state licensure as a registered nurse, APNs must obtain and maintain certification from either a professional organization or a national certification organization. These requirements for formal documented continuing education also vary by organization.

Continuing Education for Physicians

Physicians maintain licensure to practice medicine through the local state medical boards in the state in which they physically practice. Currently, there are only six states that do not require CME hours for licensure renewal (Colorado, Montana, New York, Oregon, Vermont, and Wyoming). Some states call for some CME content to focus on topics such as medical ethics, risk management, or HIV/AIDS. The state medical boards

range in their requirements from a minimum of 12 hours CME in Alabama, to as many as 50 hours per year in many states (American Medical Association, 2005).

In a cross-sectional study of 379 physicians in the United States, Landon et al. (2002), found that specialists, as measured by HIV experience, and generalists demonstrate similar trends in the care of HIV positive patients. Infectious Disease specialist exhibited produced slightly higher knowledge scores. They also report that HIV knowledge is linked to the number of HIV infected patients cared for rather than to the practitioner's area of expertise. Thus, postulating that general physicians with increased HIV knowledge through experience (higher HIV caseload), familiarity with the latest HIV literature, and conference attendance are capable of being HIV experts.

Continuing Education for Physician Assistants

Physician assistants (PAs) obtain certification from the National Commission on Certification of Physician Assistants (NCCPA). The applicant for the Physician Assistant National Certifying Examination (PANCE) must be a graduate from an accredited PA program. After certification, the PA is required to complete 100 continuing education hours and reregister with the NCCPA every two years. In addition, it is mandatory for PAs to repeat the Physician Assistant National Recertifying Examination (PANRE) or Pathway II for recertification every six years (American Academy of Physician Assistants (2005).

Suggs et al. (1998) compared a 5-hour traditional workshop conference method of continuing education with a self-instruction multimedia package using videotapes that took approximately 6 to 10 hours to complete. The sample consisted of registered nurses in both study groups. The researchers found statistically significant increases in mean scores of both groups after completion of the continuing education program. The cost effectiveness of the two educational methods was also evaluated. While the 5-hour traditional workshop's initial cost to a participant or institution may have been higher than the self-instruction method, this non-traditional method was less expensive after factoring in the program development, delivery, maintenance, and final cost.

Registered nurses in South Dakota were surveyed to examine their perceptions of their nursing competence, the degree to which their continuing nursing education needs were achieved, and their views on the relationship between continuing education and competence. Hegge, Powers, Hendrickx, and Vinson, (2002) found that 92% of the 559 nurses that responded to this study perceived themselves as competent in their nursing practice. Thirteen percent reported, "nursing competence definitely depends on CNE...and 54% are somewhat convinced" there is a link between continuing education and nursing competence (p. 27). Forty-four percent reported that their continuing nursing education needs were being achieved, with the highest percentage coming from the nurses that held a national certification.

A review of 99 randomized controlled trials evaluating the effectiveness of continuing education interventions found that 101 of 160 interventions illustrated a positive change in no less than one outcome measure. There were 148 interventions that concentrated on physician performance; 70% of those achieved this goal. In addition, there were 46 programs that focused on healthcare outcomes, and 48% of those met this target. Effective educational strategies were those that included reminders, patient-mediated interventions, outreach visits, opinion leaders, and multifaceted activities. Less effective educational strategies included audit with feedback, and provision of educational materials without the above enhancements. Formal continuing education programs such as conferences were of minimal impact. However, conferences with the supplementation of enabling or practice-reinforcing strategies were beneficial (Davis, Thomson, Oxman, & Haynes, 1995).

Davis et al. (1999) conducted a review to expand the inquiry to effectiveness of formal continuing education and the conditions under which formal continuing education is effective in altering physician performance or health care outcomes. Through review of 14 research studies with 17 interventions, the researchers found that nine produced an alteration in physician performance. Davis et al. (1999) also found that effective education interventions include interactive techniques, discussion, role-play, sequenced sessions, or hands-on strategies. These results are congruent with the main constructs of adult learning theories, which describe thriving adult education programs to be learner-centered, interactive, “relevant to the learner’s needs, and engaging, and reinforcing”

(p. 871). They are also congruent with the strategies and methods health educators employ in designing and implementing education programs.

Traditional continuing education strategies such as conferences, lectures, and didactic sessions have shown only minimal impact on physician practice. Analysis of education interventions in a review of studies has failed to consistently demonstrate a modification in physician performance or improvement in healthcare outcomes (Davis et al., 1995; Davis, 1998; Davis et al., 1999). The lack of consistency in behavior change may be related to the physicians' stage of readiness to change, which in turn influences the lack of change in healthcare outcomes (Davis, 1998; Davis et al., 1999). These educational programs may facilitate an increase in competencies such as knowledge, skill, or attitude, but the impact on performance change or patient care is limited (Davis et al., 1999).

HIV/AIDS Education and Training Programs for Healthcare Professionals

Gallagher (1996) cites the three domains of learning as essential for successful HIV education and training programs. The first domain is *cognitive*, which involves existing knowledge and new learning. The second, the *affective* domain, refers to attitudes and the ways in which the learner is influenced by previous experiences. This relates to any past professional or personal experiences with HIV positive individuals; such attitudes play an important part in the manner in which the past influences the present and the future. For example, attitudes affect the learners' receptiveness to

acquiring new knowledge about caring for people living with HIV/AIDS. The third domain is *behavioral*, which relates to skills and the ability to build upon past experiences by repeating newly learned tasks (p. 7-9).

There are various types of educational programs utilized for continuing educational purposes to educate and train healthcare professionals. Experiential methods commonly used are internships, mentorship's, mini-fellowships, and clinical preceptorships (Gallagher, 1996; Grindel & Patsdaughter, 2000). During these experiences, healthcare professionals work directly with experienced HIV clinicians who provide education to improve skills in the care of people living with HIV. In a qualitative study, the role of the nurse mentor was examined, from the nurse's perspective as well as from that of students and HIV staff, in order to understand mentoring as a method to increase the population of nurses available to care for people living with HIV. The results from the participants were positive and summarized in the themes of characteristics, behaviors and responsibilities of the nurse mentor (Grindel & Patsdaughter, 2000). However, the healthcare professionals' perceived self-efficacy to care for people living with HIV as a result of this mentorship experience was not explored.

Willingness to Care

Barriers to providing successful HIV educational programs for healthcare professionals are multifactorial. They include issues related to the teacher, learner, societal and cultural beliefs, healthcare institutions, stigma, fear, behaviors, attitudes, lack of knowledge and willingness to care for people living with HIV (Gallagher, 1996; Huba,

Melchoir, Brown, Larson, & Panter, 2000b). Many HIV continuing education programs are based on the assertion that increasing knowledge will also increase confidence, satisfaction with skills, and willingness to treat people living with HIV/AIDS. (All & Sullivan, 1997; Dimick, Levinson, Manteuffel, & Donnellan, 1996; Gallagher, 1996; Irving, Ferguson, Cox, & Farnsworth, 1997; Wyness & Goldstone, 1998).

The literature regarding healthcare professionals' willingness to care for people living with HIV and the association with predicting factors for these behaviors is inconclusive (Berkowitz & Nuttall, 1996; Colombotos et al., 1995; Dols & Bradley-Magnuson, 1996; Gerbert, Maguire, Bleecker, Coates, & McPhee, 1991; Highriter, Tessaro, Randall-David, & Quade, 1995; Radecki, Shapiro, Thrupp, Gandhi, Sangha, & Miller; Yoder, Preston, & Forti, 1997). Yedida, Barr, and Berry (1993) evaluated physicians' fear, attitudes, and willingness to care for people living with HIV during different stages of professional training. Medical residents, especially those within surgical specialties, were more negative and fearful than were medical students and faculty members regarding willingness to care for people living with HIV. Others (Berkowitz & Nuttall, 1996) investigated the pediatric nurse population to examine attitudes, and demonstrated that 57% of nurses surveyed reported improved attitudes after having had experience with patients that were HIV infected.

The use of consultation practices as a strategy to provide HIV-related continuing education for healthcare professionals is widely documented in the literature. Liljestrand (2004) surveyed 494 healthcare professionals that called a *Warmline*, a telephone service

that provided consultation on providing HIV care. The purpose was to examine the influence of healthcare professionals' characteristics on attendance at continuing education programs, satisfaction with skill, consultation needs, and willingness to care for people living with HIV. The study demonstrated that HIV experience and profession were consistent predictors of continuing education attendance, satisfaction with skills, consultation needs, and willingness to provide HIV care. However, "variables such as practice setting, state of residence, gender, race, years in practice, current patient load, and years of HIV experience were found to be of little or no value as predictors" (Liljestrand, 2004, p. 45-46).

The relationship of healthcare professional age to apprehension toward providing care to people living with HIV is not clear (Preston, Forti, & Kassab, 2000). Some studies have found that healthcare professionals in advanced age groups demonstrate greater willingness to care for persons infected with HIV (Lester & Beard, 1988; Royse & Birge, 1987). Others, however, detected a reverse connection with age, finding that older nurses, those with higher family income, those who were educated in diploma schools, and those who reported religiosity had less positive attitudes about people living with AIDS and about the disease itself (Koch, Preston, Young, & Wang, 1991). Scherer, Haughey, and Wu (1989) identified older nurses as having more negative attitudes regarding homosexuality in comparison to younger nurses. Still others have found no association of age to willingness to care for people living with HIV (Goldenberg & Laschinger, 1991). This remains an area that warrants further investigation.

Rural, urban, and suburban healthcare professionals encounter barriers to accessing traditional continuing education programs. The impact of budgetary cuts for work-related travel in this economic climate presents yet another barrier (Suggs et al., 1998). Professionals that provide care to rural areas are faced with the additional challenge of distance to the national professional conferences, higher travel expenses, and less availability of qualified clinical coverage (Suggs et al., 1998). This leads many healthcare professionals to access outside financial support from pharmaceutical companies and personal resources in order to attend traditional continuing education activities.

The existences of these barriers do not change the reality that healthcare professionals need HIV continuing education programs. In telephone interviews to assess involvement in HIV care and continuing education needs of a stratified random sample study of rural nurse practitioners in California, Lewis and Miramontes (1999) found that 65% of the participants had seen an HIV positive person within the past year. When questioned about interest in attending an educational program in Los Angeles or San Francisco, nearly half of the respondents reported not being interested. However, all 65% that had seen an HIV infected individual within the past year reported interest in attending a program in the local area (Lewis & Miramontes, 1999).

Reducing fear and anxiety about caring for people with HIV is an important aspect of increasing the cadre of health professionals available to provide such care.

Dimick, Levinson, Manteuffel, and Donnellan (1996) investigated a sample of 279 nurse practitioners in the state of Georgia. This study identified a positive relationship between HIV continuing education and lowered fear and anxiety, and improved attitudes and behaviors towards people infected with HIV. Contact with infected individuals was another significant factor related to improved behaviors. However, over the past decade and a half, reports on attitudes are conflicting and inconclusive (Gerbert, Maguire, Bleecker, Coates, & McPhee, 1991; Martin & Bedimo, 2000; Messmer, Jones, Moore, Taggart, & Parchment, 1998; Prasad, 2001; Shapiro, Hayward, Guillermet, & Jayle, 1992).

Knowledge and Experience

The knowledge domain of learning, designated to increase an individual's theoretical foundation, is an essential aspect of any HIV education program. Colombotos, et al. (1995) published the results from a national probability sample survey conducted in 1990-1991 with 958 physicians and 1,520 nurses from 25 states. With regard to knowledge, 68% of the respondents correctly answered 1 out of 7 questions about HIV transmission. When questioned about HIV and Hepatitis B transmission with a needle stick, 30% of the nurses and 61% of the physicians answered the question correctly. Tierney (1995) conducted a review of the research literature about HIV/AIDS knowledge, attitudes, and nursing education. The search for research evaluation studies to meet the inclusion criteria of research content, evaluations, and nurse surveys yielded

limited results. Nonetheless, it was concluded that short one-day programs were effective in creating positive change in knowledge and attitudes.

Eagle and Brouard (1995) published the outcomes of an AIDS education class taught over the course of 3 days. The purpose was to evaluate the effectiveness of the program in changing healthcare professionals' knowledge and attitudes, as measured by the "Knowledge and Attitudes Scale" administered before and after the course. The findings were a change in attitudes, but there was no statistically significant change in knowledge (Eagle & Brouard, 1995).

Sowell, Seals, Wilson, and Robinson (1998) conducted a study to evaluate the effectiveness of an HIV/AIDS education program for 173 registered nurses and nurse practitioners in Georgia. The program consisted of an 18-day didactic segment combined with a 12-day internship. The researchers demonstrated effectiveness with improved knowledge of the educational program based upon three outcome measures that were met by (a) developing a basis for HIV/AIDS public and local policy, (b) providing a safe haven for nurses to communicate case situations, and (c) empowering the participants to become actively involved in HIV prevention programs in their local communities.

A unique aspect of this study is that the researchers conducted a follow up survey with the participants 6 to 18 months after the program was completed. This follow up study demonstrated continued impact as a result of the educational intervention. This encouraging impact is based on the following trends identified; (a) the nurses seeking additional HIV knowledge independently, (b) serving as a consultant, (c) conducting risk

assessments, and (d) more patients were seeking assistance for social services from the nurse (Sowell et al., 1998).

Messmer et al. (1998) examined attitudes, knowledge, and compliance with infection control standards for HIV/AIDS patients with Tuberculosis in a group of 50 staff nurses. The nurses were divided into an experimental and control group. Analysis showed an improvement in TB knowledge, but no significant positive change in attitudes or knowledge.

Investigations of an association between change in knowledge and attitudes after HIV education programs are conflicting. Mitchell (1999) asserts that “knowledge alone does not appear to decrease nurses’ fear or change attitudes of nurses towards caring for AIDS patients, although some research disputes that statement” (p. last paragraph). Education programs are important for healthcare professionals to maintain competency in their individual areas of practice and to provide quality healthcare. However, combining information with environmental influences such as experiences with people living with HIV/AIDS, may be the key to improving patient outcomes and quality of care. Eakin and Taylor (1990) found that increased experience in HIV/AIDS care improved provider attitudes toward the care of patients with HIV/AIDS (as cited in Hanvey, 1994, p. 14). This has also been repeatedly demonstrated in more recent research studies (Berkowitz & Nuttall, 1996; Corless & Nokes, 1996; Radecki et al., 1999; Shapiro et al., 1992).

As mentioned earlier, the goal is to expand the group of healthcare professionals capable of medically managing people living with HIV and reduce the characteristic in the HIV and general community that are factors associated with HIV transmission (U.S. Department of Health & Human Services, 2002). Actually, some of the programs discussed in this literature review have been associated and funded through the Health Services and Resources Administration (HRSA) under the AETC or Special Project of National Significance (SPNS) grants.

An extensive qualitative research evaluation study to capture the long-term effects of an HIV/AIDS education and training program was performed with 218 participants from nine programs in the United States (Huba et al., 2000b). The research team contacted these participants an average of 8 months after the training and completed telephone interviews with eight standard questions. The study results were categorized into three distinct themes: (a) general perspectives, (b) healthcare provider service provision, and (c) system changes. The findings indicated that overall, the training program was “strongly effective and positive for areas involving service provision to patients/clients and were less positive for areas involving setting up referral networks” (p. 110).

Another aspect of this evaluation research study with this same group was conducted by Henderson, German, Panter, Huba, and Rohweder (1999) to identify system changes in a healthcare organization as a result of attending an HIV/AIDS

education and training program. Systems change was defined for the purpose of this study as “a clear mention by the trainee that different procedures and guidelines are being followed due to the information acquired during the training” (p. 415). Over half of the participants interviewed (55.5%) were able to provide at least one specific example of a system change as a result of the training.

When examining predictors for a system change, the researchers reported there was no statistical significance with project site, gender, or age. Also, it was noted that the participants provided an example of system change were positive about the training and mostly representative of the physician and educator class. Seventy three percent of the participants rated the training as *very* or *extremely valuable* (Henderson et al., 1999, p. 422). Prior to this study, evaluation programs were focused on individual healthcare professionals (Tierney, 1995). This evaluation expanded the target to include the organization that provides care to people living with HIV (Henderson et al., 1999).

The AETC incorporates traditional and non-traditional strategies in the provision of educational programs to healthcare professionals. Strategies utilized include small and large didactic type meetings. For example, AETCs organize luncheon seminars and major conferences in collaboration with accredited educational organizations and universities. Preceptorships, mini fellowships, telemedicine set-ups, phone consultation services, self-study modules and CAI programs are other strategies AETCs employ.

As previously mentioned, healthcare professionals have been required to obtain continuing education credits for many years, in order to stay updated with the latest information in the medical profession. The use of distance education methods began in the 1950s; in the 1970s audio teleconferencing became available as a strategy for continuing education (Curran et al., 2000). Shortliffe (1983) predicted that computer usage by physicians would increase and listed guidelines for the future; these guidelines have been implemented to some degree.

The literature regarding physicians and computer usage for continuing medical education is confusing and inconsistent. In 1999, the Canadian Medical Association reported that 53% of physicians acknowledged searching professional's journals online and 41% stated they accessed continuing education Web sites. In 2000, the American Medical Association reported that 70% of physicians surveyed were Internet users (as cited in Casebeer, Bennett, Kristoco, Carillo, & Centor, 2002).

Survey results from study released by PERQ/HCI Media discussed that 71 % of the 6,654 physicians surveyed surfed the Internet for professional business, and an additional 5 % advised their staffs to obtain medical information online. Also, the media group reported that 24% of the physicians get 20% or more of their continuing medical education from the Internet (McKillen, 2002). In contrast, Brown et al. (2001) reported that only 2.7% of physicians use the Internet for continuing education purposes, with

more recent information (as cited in Wutoh et al., 2004) reporting that 31% of physicians use the computer as a source of continuing education information.

The literature regarding CAI and physician age, gender, race/ethnicity is also conflicting. Harris, Novalis-Marine, and Harris (2003) report young females are utilizing the Internet for continuing education at a high rate. However, there was no relationship between gender, age, or race/ethnicity and healthcare professionals' perceptions of the effects of online continuing education activities. Participants that were academicians preferred traditional educational programs (Bernhardt, Runyan, Bou-Saada, & Felter, 2003).

Workshops have been developed and presented for the purpose of educating physicians on the use of computers for email, medical information retrieval, CD-ROMs, and computer-assisted learning (Allen, Kaufman, Barrett, Paterson, & Sargeant, 2000). In a comparison review of databases available for online CME between 1997 and 2004, Sklar (2004) found 271 Web sites in 2004 and 150 Web sites in 2000. These results were in comparison to only 13 web sites available for CME in 1997. These databases also provided the target population, cost, educational method, and number of hours for program. However, there are still issues and concerns regarding the safety, accuracy, credibility, and integrity of the information transmitted on the Internet, and the ability to evaluate online resources (Huckstadt & Hayes, 2000; Lirici, 2002). Also, it is important to remember that change is difficult for people and some healthcare professionals prefer to stay with traditional methods of continuing education.

The literature cites advantages of CAI for continuing education as including cost effectiveness, flexibility, and convenience (Gandsas & McIntire, 2002; Wutoh, Boren, & Balas, 2004). This information is consistent with the results of a study (Cobb, 2003) that assessed the Internet usage habits of oncology nurses and physicians seeking continuing education over the Internet. These results were compared with the findings in the 2001 and 2002 survey. This comparison identified an increase from the past surveys regarding usage of the Internet for continuing education purposes by both nurses and physicians. Both groups of healthcare professionals listed cost and easy access as factors they desired to be associated with future CAI continuing education programs (Cobb, 2003). In a study assessing the usage of the Internet in a random sample of 2,200 primary care and specialty physicians, 80% documented regular usage for professional reasons; yet, 70% reported hardly ever surfing the Internet specifically for online continuing education (Casebeer, Bennett, Kristco, Carillo, & Centor, 2002).

Computer assisted instructional programs are being developed and have been tested through research for objectives in the health education and medical community. One such study evaluated a CAI program designed to improve healthcare professionals' communication skills and behaviors toward patients. The evaluation demonstrated the program's positive effects on quality of physician performance (Hulsan et al., 2002).

Wutoh, Boren, and Balas (2004) performed a review of randomized controlled trials on Internet-based continuing education programs. An exhaustive search of four

national data base sources was performed for 1982 to January 2004. Of the sixteen studies that met the criteria, six documented a positive change in knowledge in comparison to traditional type continuing education programs, and three demonstrated a positive change in practices. The conclusion of this review was that Internet-based continuing education programs are as effective in conveying knowledge as traditional continuing education programs (Wutoh et al., 2004).

Hybrid forms of education combine traditional with nontraditional strategies. The benefit of a hybrid system of CAI is that it allows the delivery of a large amount of multimedia information from the Internet through use of an easily portable CD-ROM (Curran et al., 2000). Curran and colleagues evaluated a hybrid delivery system to instruct physicians in dermatologic office procedures. This method was found to be effective in increasing knowledge and improving self-reported competency. Bell et al. (2000) performed a randomized controlled trial with a sample of 162 medical residents to compare knowledge, learning efficiency, and satisfaction with a hybrid program that combined print and Web-based materials for self study about acute myocardial infarction. The results demonstrated comparable scores with the immediate posttest scores, but a reduction in scores was noted with the follow-up test given 4 to 6 months later (Bell et al., 2000).

Nurses

Continuing education methods for nurses are also varied. Advanced practice nurses in Nevada were sampled to appraise this population's preference, practices, and

barriers to accessing different methods of continuing education. With a response rate of 54%, the study first reported the continuing education methods used by the participants within the past year. The results were as follows: advanced practice nurses used in-person conferences (98%), live satellite conferences (33%), computer-based/Internet (5%) and CD-ROM (3%). Preferences were ranked as follows: in-person conference, print-based self-study, and interactive video conference. Interestingly, the live satellite was ranked as the least preferred method (Charles & Mamary, 2002).

The Nevada nurses study also examined participants' views of CAI for continuing education. "Lack of ability" was noted as the most common barrier to utilizing computers or the Internet for continuing education. Seventy three respondents reported having access to a computer at the office and 82% reported computer availability at home. When asked the reason for not using the Internet or CD-ROM, participants answered "not knowing how." However, the majority of respondents (75%) were interested in receiving information on computer, Internet, and using CD-ROMs for continuing education (Charles & Mamary, 2002).

Charles and Mamary's (2002) findings regarding lack of knowledge, ability, and skill to utilize the computer for continuing nursing education (CNE) is consistent with the results in the study by Hegge et al. (2002). In this study of a group of South Dakota nurses, 76% of the nurses had computers at work and 72% had computer access at home. The reasons provided as barriers to computer usage for CNE included lack of knowledge, lack of time, and lack of computer/Internet access. Furthermore, about 13% report rarely

accessing the Internet and that the same proportion reported never accessing the Internet (Hegge et al., 2002).

Similarly, Schmitt, Titler, Herr, and Ardery (2004) document problems in recruiting nursing staff as participants in a CAI evaluation research project. Barriers to participation given were related to lack of computer usage skills, computer speed, and lack of time provided at work for continuing education. These problems are also substantiated with evaluation results published by Lemaire and Greene (2003) in a study that compared four electronic media methods of delivery for continuing education: (a) in person with a computer projector, (b) desktop videoconferencing, (c) Web pages, and (d) CD-ROM. In measuring satisfaction and value, the CD-ROM group consistently provided higher ratings than the other three groups (Lemaire & Greene, 2003). Furthermore, Atack and Rankin (2002) reported similar computer access and time related barriers for a group of registered nurses during a web-based educational course.

HIV/AIDS CAI with CD-ROM Education Programs for Healthcare Professionals

The researcher utilized the assistance of a certified librarian from the University of Texas Southwestern Medical Center at Dallas during the process of reviewing the literature and locating research studies involving continuing education, CAI, CD-ROM and HIV/AIDS. The CINAHL, MEDLINE, PsycINFO, NLM Gateway, and ERIC databases were searched for this study. However, findings were limited for the topic areas of HIV/AIDS, CAI, and CD-ROM.

Garrett, Selnow, Dobkin, and Heaton (1990) published reports of a study showing effectiveness of a CAI for an AIDS infection control education program geared toward medical residents. Participants were pleased with the CAI strategy and preferred it to the printed materials (Garrett et al., 1990). Vivekananda-Schmidt, Hassell, and McLean (2004) discuss the research evaluation methodology issues related to CD-ROM on rheumatology for healthcare professionals and medical students. Publication of the study findings is currently pending.

Henderson (1998) is the pioneer in designing and developing an interactive CD-ROM on HIV/AIDS for educating physicians, nurse practitioners, and physician assistants. This “Virtual Mini-fellowship: Primary Care of the HIV/AIDS Patient” originally cost \$149.00 for the 2 disk CD-ROM set, with 8 hours of continuing education credit available (Izenberg, 1998). Over the past few years, this product has undergone several revisions. The latest available version was provided in 2002, and is currently available online at no charge via download or by requesting the CD-ROM (http://iml.dartmouth.edu/education/cme/HIV_Primary_Care/install.html). The developers of this CD-ROM program were contacted and responded that currently there were no available published information regarding evaluation of the HIV CD-ROM. They do have in-house data from 7 years’ of student evaluations from Dartmouth Medical School, which totals approximately 450 people (60 per year). However, they are planning to incorporate the CD-ROM program in a course for the medical students starting in December. This program will be set-up for the students to go through the

program in 2 days, in small teams (personal communication with S. Johnson & J. Henderson, October 17, 2005).

Evaluation Research Study: CAI Educational CD-ROM Program Background

In 1994, the Mountain Plains AIDS Education and Training Center (MPAETC) received funding from HRSA under a Special Project of National Significance (SPNS) grant to compare education methods for rural health care providers. The goal of the education was to increase the knowledge, ability, and willingness of these providers to deliver HIV-related services. Because the target was rural providers with limited access to continuing education, the MPAETC decided to use self-study modules as one of the methods for comparison (personal communication with MPAETC, October 7, 2005).

The first MPAETC self-study module was targeted to providers who worked in rural areas. It covered information related to basic HIV biology, transmission prevention, pathophysiology, diagnosis, and treatment. It was case based, using a young woman living in a rural area as the example (Henderson et al., 1999). This module went through 5 editions as a hard copy manuscript that was revised every 12-18 months.

The results of one evaluation research project conducted with the self-study module from 1999 to 2004 demonstrate a very high level satisfaction by the participants. There are also significant improvements noted from the before to after training evaluation questions regarding the program objectives (personal communication with MPAETC, October 15, 2005). The success of this product led to additional self-study modules in similar formats: one on Perinatal Transmission of HIV, one for Dental Care Providers,

and one targeted to clinicians who work with Native American patients (personal communication with MPAETC, October 7, 2005).

Educational CD-ROM Program Development

In 2002, MPAETC made the decision to make the self-study format more interactive. The result was a CD-ROM format that enabled the MPAETC to provide a large amount of material into a small package, as well as a format that can be easily updated as information changed. Once the CD format was decided, the MPAETC collaborated with a multimedia design company to explore structure and design of the content. An initial goal in design was to provide user interaction through case studies and self assessments. The electronic format, similar to a hybrid delivery system, allowed the authors to include more cases to cover a broader spectrum of patient representatives from this epidemic, thus providing a more realistic case base for learning. User interaction is also encouraged through clickable references and citations throughout the module (personal communication with MPAETC, October, 7, 2005).

Educational CD-ROM Program Design & Content

The CD engages users in a number of ways, including multiple Web links for additional reading, citations, slides and pictures, supplemental learning resources, and 15 interactive case studies. It has supplemental audio and video media including a personal message from Donna Sweet, MD, and an in-depth animation of the HIV lifecycle. The “Resources” section was created because the MPAETC wanted the CD to also serve as a resource for providers. This section helps providers easily access the cases, slides,

pictures, animations, and other supplemental learning materials referenced throughout the CD without having to go through the entire self-study process (personal & electronic communication with MPAETC, October 7, 2005).

Perceived Self-Efficacy and CAI

Knowles (1973) identified four principle guidelines in preparing adult education programs: (a) adults perceive themselves to be self-directing in all areas of their lives, including decisions about what they want to learn; (b) adult learners are insulted if their varied, rich, life experiences are devalued or ignored; (c) adults experience a “readiness to learn” and seek information soon after awareness of a knowledge deficit occurs; and (d) adults are pragmatic learners who seek education in order to solve problems and cope with immediate issues (as cited in Gallagher, 1996).

The National Institute of Education (1984) acknowledged three challenges in the development of educational programs in order to maximize knowledge gained: (a) students should be actively involved in learning; (b) institutions and individual teachers should clearly communicate requirements, standards, and objectives of learning; and (c) assessment and feedback should be regular and systematic components of the learning process (as cited in Gallagher, 1996).

Knowledge alone is not enough to effect behavior change. Knowles’ and the National Institute of Education’s ideas of active learning and self-direction are keys to bridging the gap between knowledge and behavior. The Social Cognitive Theory concept of perceived self-efficacy provides a framework for linking knowledge with healthcare

professionals' confidence in and perception of capabilities to care for people living with HIV and identifying individuals at risk for HIV (Bandura, 1994). People with high self-efficacy promote a personal controlled space that exudes a sense of self-satisfaction and the sense that the person can achieve what they think they can achieve (Bandura, 1994; Pajares, 2002). In addition, improved self-efficacy has been linked with "increased motivation, goal setting, and achievement" (Madorin & Iwasiw, 1999, p. 282). Thus, if healthcare professionals have high perceived self-efficacy and believe they have learned what is needed to provide care to people living with HIV, it follows that they will feel able to perform tasks and achieve goals in the community they serve.

Sowell, Seals, Wilson, and Robinson (1998) demonstrated improved self-efficacy for nurses following a HIV classroom and internship education program. Participants reported increased professional preparedness to care for people living with HIV. Self-efficacy often increases with increased exposure to the task and practice in accomplishing it. Willard, Liljestrand, Golschmidt, and Grumbach (1999) showed the relationship between rural primary care physicians' caseloads of HIV patients and self-reported confidence in the ability to provide appropriate care for those patients. However, in a study published by Panter et al. (2000), the level of ease, confidence, and personal skill post-HIV/AIDS training was associated with a greater amount of HIV education, and longer periods of experience in the HIV specialty area rather than participant demographic characteristics.

Murdock and Neafsey (1995) demonstrated significantly high improvements in advanced practice nurses' self-efficacy scores from pretest to immediate posttest and two years after a continuing education course on pharmacology. Neafsey (1998) demonstrated improved knowledge and self-efficacy scores immediately after a CAI program on "The Pharmacology of Alcohol" for advance practice nurses. Scores for a follow-up posttest taken 5 months after the intervention, were lower than the immediate posttest scores but significantly higher than the pretest scores (Neafsey, 1998). Madorin and Iwasiw (1999) conducted a study with a group of nursing students participating in a CAI simulation and identified a significant increase in self-efficacy post simulation. The increase was still evident after clinical posttest.

Development of any education program should be collaborative, with a team that includes a health educator and a representative of the intended audience. The healthcare professionals discussed in this literature review each offer unique expertise to peer education regarding HIV/AIDS. The health educator's training and background provides the structure with which to develop education programs based on a combination of theory, principles of adult education, and evidence-based medicine.

Summary

The numbers of individuals diagnosed with HIV/AIDS are increasing. More healthcare professionals will encounter HIV infected patients and those at risk for acquiring the infection in their daily practice. With the strides in education, patient

management practices, and adherence to anti-retroviral treatments; individuals are living longer with this chronic disease.

The documentation of evaluation projects that assess the effectiveness of CAI HIV education programs for healthcare professionals is very limited. Moreover, only one HIV education program on CD-ROM was identified, and there is no published information on the evaluation of the effectiveness of that program. The question of how to master the task of assessing the impact of and forecasting the value of technology-based education strategies is a challenge (Curran et al., 2000, p. 107). Given the relative newness of CAI, it is not surprising that few studies have been conducted to date. In fact, this finding reinforces the need for such research.

CHAPTER III

METHODOLOGY

This research study utilized a combination of quantitative and qualitative methods to collect information for the purpose of conducting program evaluation. Short answer questions were integrated as a means to gather information and reduce threats of internal validity (Dignan & Carr, 1992). As this program evaluation involved the educational strategy of CAI, a Web-based survey format was chosen for consistency. This strategy has proven to be an accurate and effective method of gathering information that provides flexibility and convenience for participants, and higher response rates (Satmetrix, 2001; Sheehan, 2001; Swart & Hancock, 2002). With more than 50% of households having a computer, the incorporation of Web-based surveys has increased over the past few years (Swartz & Hancock, 2002). While some healthcare professionals continue to prefer traditional forms of CE, many are migrating to computer assisted strategies for continuing education (Anderson & Mercer, 2004; McKillen, 2002). This chapter describes information on the methodology, design, sample population, data collection, instrumentation, and data analysis of this CAI research study.

Design

The pretest and posttest quasi-experimental design was essential for the purpose of this program evaluation. The primary objective was to evaluate the effectiveness of

CAI (CD-ROM) as a strategy to educate health care professionals about HIV/AIDS prevention, early intervention, and health promotion. The effectiveness of the CD-ROM product was evaluated, and the healthcare professionals' perceived self-efficacy to utilize CAI and provide care for people living with HIV was assessed. The participants' level of satisfaction with this specific CAI strategy was also measured.

Population and Sample

The study participants were comprised of a purposeful sample of healthcare professionals that provide direct primary care and specialty services; these professionals are the target population of the AETCs. Therefore, registered nurses, advanced practice nurses, physicians, and physician assistants who were currently practicing in the United States were invited to participate in this study. The main method of marketing was a standard recruitment announcement (See Appendix A) that included content information approved by the Institutional Review Board (IRB). The recruitment announcement was sent to potential participants via emails, flyers, professional listservs, newsletters, verbal presentations at professional meetings, and a posting on the Association of Nurses in AIDS Care (ANAC) Website.

This recruitment announcement was designed to get the attention of the targeted audience, to peak their interest, and to provide the basics of the evaluation for the education program. The announcement included the education program title, strategy, CE provider, number of continuing education units offered, and information about how to get more information. The announcement also listed the research study hyperlink, which

directed the potential participants to the Website with the “Research Study Instructions” (See Appendix B). As a result of this marketing strategy, a total of 221 participants completed the pretest and were mailed the educational CD-ROM that served as the intervention.

Protection of Human Participants

The Institutional Review Board (IRB) of the University of Texas Southwestern Medical Center (UTSWMC) at Dallas and the IRB of Texas Woman’s University (TWU) in Denton reviewed this program evaluation research study (See Appendix C). The study met exempt category approval by both universities based on the statement “Research conducted in established or commonly accepted educational settings, involving normal educational practices, such as (i) research on regular and special education instructional strategies, or (ii) research on the effectiveness of or the comparison among instructional techniques, curricula, or classroom management methods” (UTSWMC IRB, 2004).

In lieu of an informed consent form, the following statement was placed at the end of the “Research Study Instructions” Web page, in black bold fonts, before the first section of the pretest: “The submission of your completed questionnaire with contact information constitutes your informed consent to act as a participant in this research.” The Website information notified potential participants that 6 continuing education units or 5 continuing medical education hours would be awarded to those whose posttest score was 75% or greater.

At the end of the pretest, participants were asked to provide their name, email address, and mailing address contact information. Participants were advised with the privacy and confidentiality statement posted at this point that identifying information was collected simply for the purposes of mailing the CD-ROM product, communicating with the participants electronically, and granting a continuing education certificate upon successful completion of the education program. A unique identifier, required by HRSA, is requested at the beginning of the demographic and professional survey.

To assure privacy, confidentiality, and anonymity of the participants from the researcher, an online research company and faculty research associate were retained to assist with data collection. During the process of this evaluation research study, there was no time that the researcher had access to test scores that matched participants' names. After the participant completed the pre-test and provided contact/ mailing information, the online research company sent an excel sheet to the research associate, a doctoral prepared faculty member from a non-affiliated university. This was done in order to mail the CD-ROM to the participants. The excel sheet contained only the participants name, mailing address, unique identifier, pretest date, and email address.

Small tokens, prizes, and gift certificates as incentives have shown to be an effective tool to increase response rates from surveys (Jensen, 2005). Therefore, as appreciation and incentive for the participants to complete the post test, the researcher included an *Appreciation Drawing*. The IRB at TWU was notified of this decision and

approval was granted (See Appendix D). This incentive was announced in an email (See Appendix E) sent to participants who completed the pretest.

At the conclusion of the study, the drawing was performed by the online research company using a random numbers table. An email (See Appendix F) was sent to the two winners of this drawing to make arrangements for receipt of their individual prize. Both winners made contact with the researcher and were given their individual prize. The first winner, from the North Carolina area, received the \$100 gift certificate for Amazon.com. The second prize winner received a gift card for Target department stores in the amount of \$100. An email (See Appendix G) was also sent to all the participants that completed the posttest, to thank them for participating in the evaluation research project and to inform them that the appreciation drawing had been conducted. The email indicated which States the winners were from, but, in order to maintain privacy and confidentiality, no participant's name or other identifying information was provided.

Data Collection Procedures

In accordance with the CAI delivery format for the educational strategy, a Web-based method was selected for data collection. The Web survey method has been reported to provide the benefits and advantages of "a faster response, protection against the loss of data, easy transfer of data into a database for analysis, cost savings, convenience for the respondent, the possibility of wider geographic coverage, and a potentially better response rate" (Mertler, 2002, p. 50). Furthermore, when comparing Web-based surveys with traditional methods such as telephone or pencil and paper, Web based surveys were

as effective, provided more flexibility, and even produced a higher response rate than some traditional methods (Mertler, 2002; Satmetrix, 2001; Sheehan, 2001).

February 8, 2005 was the first day participants were recruited for this study. The approved content information was distributed via flyers, email, and verbal presentations. The next phase involved the MPAETC emailing the recruitment announcement to all the AETC directors and members of the AETC professional listserv in mid-February 2005. However, an unforeseeable problem occurred when the http link broke. This breakage caused a problem when clicking the link and directed potential participants to another Elite Research Web site. This broken link issue was evaluated by three computer experts who mutually decided it was not preventable and it was related to events that occur in the email transfer process. Therefore, the statement "If the link below is broken at the end: please copy and paste the first line of the link into your web browser, then copy and paste the line below in your web browser" was placed before the link to provide instructions to the potential participants in the event of another link malfunction.

In the months of April, May, and June 2005, the announcement was posted on the Association of Nurses in AIDS Care (ANAC) Website, placed in the second quarter ANACDOTES newsletter, and the ANAC-Metro Atlanta Chapter newsletter. During this period, an abbreviated version of the recruitment announcement was placed in the Delta Theta Chapter of Sigma Theta Tau Newsletter, at the University of Texas at Arlington (See Appendix H). The email announcement and flyer were also circulated through various universities in the east coast.

As stated previously, the hyperlink in the recruitment announcement directed the potential participant to the Website with the research study instructions. These instructions were the first thing the potential participant read on the research study Website. This was strategically placed for the potential participant to review and be thoroughly informed before starting this research study. It provided the research study purpose, privacy/confidentiality statement, and procedure (See Appendix B).

Pre-Test Instrumentation

Participants were able to enroll in the program evaluation research project by taking the pretest from February 8, 2005 to July 15, 2005. The first section of the pretest consisted of a demographic and professional survey (See Appendix I) that is normally used by the AETC for descriptive reporting to HRSA. This instrument is understood to be valid because it is the individual participant providing descriptive information about his or her own professional background (Dignan & Carr, 1992). To prevent participants from skipping this section, the Website was designed in a way that the participant must complete that section before proceeding to the next section.

The second section of the pretest consisted of a self-appraisal survey (See Appendix J); incorporated to assess the participants' perceived self-efficacy to care for people living with HIV/AIDS. This survey was developed by the researcher and utilized the educational CD-ROMs program objectives for the content of the questions. The recommendations in the *Guide for Constructing Self-Efficacy Scales* were used as a format and model to prepare these questions (Bandura, 2001). For example, because self-

efficacy is concerned with an individual's perceived ability, the questions were phrased as "How well can you" instead of using the word "will." The word "can" is a judgment of capability and "will" is a statement of intention (Bandura, 2001). The 17 items utilized a 7 point Likert scale, ranging from *not well at all* to *very well*.

The third section of the pretest was a case study with 12 multiple-choice test questions to assess the current knowledge of the participant before the start of the educational CD-ROM (See Appendix K). This case study was a parallel adaptation, designed by the researcher, of the case study originally developed by the creators of the educational program CD-ROM evaluation section packet. A parallel adaptation was developed and utilized to refrain from using the exact same case study in the pretest and posttest.

On a bi-weekly basis, the non-affiliated faculty research associate received the name and mailing address of participants who had completed the pre-test. The research associate made address labels on the computer that were placed on padded manila CD envelopes. Another label was placed on the actual CD-ROM holder. The information on that label stated "To get the post-test: After studying the CD, please send your name & e-mail address to CAI@elite_research.com". This statement provided the participant instructions for accessing the posttest after review of the educational CD-ROM. The research associate placed the labeled CD-ROM in the labeled padded envelope and mailed to the participants.

Reminder email messages are an effective way to follow-up with participants and have increased response rates by 25% (Sheehan, 2001). Thus, during the interim period, from the time the participant took the pretest to the end of the study, 3 reminder emails, and 1 research study extension email were sent to the participants (See Appendix L). The announcement regarding the *Appreciation Drawing* was also mailed during this time.

Post Test Instrumentation

The post-test was available online for the participants to complete from February 22, 2005 to August 8, 2005, the final closing date of the study. Three questions were asked in order to match the participant with the pretest information for comparison and identification before proceeding to the case study posttest. To assess change in knowledge after studying the educational CD-ROM, the first section of the posttest was the same case study multiple-choice test from the pretest, with the names and order of the questions and answers changed (See Appendix M). The second section of the posttest was the Self-Appraisal Survey and was a duplicate of the self-appraisal assessment completed in the pretest (See Appendix J). However, there was a statement placed at the beginning of this section of the posttest instruction the participant to complete the questions based on after completing the educational CD-ROM.

The third section was a satisfaction survey (See Appendix N) developed by the researcher and was designed to capture the participants overall approval or disapproval of the educational program CD-ROM. This instrument included rating scales (1 = *Not at all*

satisfied to 7 = *Extremely satisfied*) and short answer questions to obtain qualitative data to assess for threats to internal validity. The fourth and final section was a compilation of questions (See Appendix O) required by the CE department at the University of Colorado to release the CEU and CME certificates (See Appendix P). After the participants completed this final section and clicked the submit button, a congratulations Web page was automatically displayed that provided the participant with final instructions (See Appendix Q). The participants were sent an email with their final case study posttest score. All participants with passing test scores of 75% or greater and failing test scores that were less than 75% were sent a standard email (See Appendix R). Participants that scored less than 75% were given an opportunity to retake the case study section of the posttest (See Appendix S). The hyperlink for the “retake” posttest was conveniently located in the standard “fail” email that was sent to participants that scored less than 75%.

The process for participants to receive the CEU/CME certificate was incorporated in the program evaluation and was completed as a courtesy to the research study participants. Therefore, the posttest information required by the MPAETC and the University of Colorado, School of Medicine, for a CE/CME certificate was transferred to a hard copy data sheet by the online research company and mailed to the MPAETC. The final step involved submission of the information to the CE office at the University of Colorado, School of Medicine for the CEU/CME certificate to be mailed to the participant.

For the purpose of this study, effectiveness was defined as a positive change in knowledge, and a positive change in perceived self-efficacy. Satisfaction was based on participant ratings of the utility, format, aesthetics, and cultural appropriateness of the CAI. Paired Samples *t* tests were conducted to test for differences on knowledge, and perceived self-efficacy from before to after the study. Analyses of Covariance (ANCOVAs), controlling for pretest measures, were conducted on posttest measures to test for differences between the levels of the demographic variables. Pearson's Product Moment Correlations were conducted between the dependent measures and the continuous demographic variables. Descriptive statistics were calculated to report the various satisfaction measures.

Summary

The main objective of this research study was to evaluate the effectiveness of a CAI educational CD-ROM program designed to educate healthcare professionals on HIV/AIDS prevention, early intervention, and health promotion. The survey instruments served as a method to measure a change in knowledge after the healthcare professionals reviewed the educational CD-ROM. An evaluation of the educational CD-ROM product was also performed. The self-appraisal allowed the healthcare professionals to assess their perceived self-efficacy to utilize CAI and to care for people living with HIV/AIDS. The findings of this program evaluation can provide essential information to assist health educators in the development of future CAI educational programs regarding HIV/AIDS.

CHAPTER IV

RESULTS

Computer Assisted Instruction has become a highly utilized strategy for the education of health care professionals in the present technology driven society. CAI also accommodates the need for flexibility in the busy lives of medical professionals. This research study evaluated the effectiveness of an educational CD-ROM, as a strategy to be utilized to reach healthcare professionals' education and training needs in the field of HIV/AIDS. The pretest and posttest quasi-experimental design was essential for the purpose of this program evaluation.

The primary objective was to evaluate the effectiveness of CAI (CD-ROM) as a strategy to educate and train healthcare professionals' about HIV/AIDS prevention, early intervention and health promotion. The effectiveness of the CD-ROM product was also evaluated and the healthcare professionals' perceived self-efficacy to utilize CAI and provide care for people living with HIV was assessed. The participants' level of satisfaction with this specific CAI strategy was also measured. Chapter 4 presents the results from the present sample.

Demographics

Two hundred and twenty-one participants completed the pretest, from 106 different zip codes, and 80 of them completed the posttest (from 31 different zip codes).

An examination of the participants who completed the posttest, showed 50 participants who passed (75% or better) and 30 participants who failed the posttest. Further examination of the high number of individuals who failed the posttest revealed that 14 individuals completed the posttest survey on the last available day and that none of these 14 individuals answered even one item correctly, even though they had correctly answered items on the pretest. Based on these findings, the researcher assumed that these 14 individuals completed the posttest survey due simply to the deadline and desire to be included in the *Appreciation Drawing*, not because they were prepared or possibly even completed the educational CD-ROM training. Therefore, these 14 participants were removed from further posttest analyses, and 66 participants who completed both the pretest and posttest were included in data analyses.

The pretest sample included data from 221 participants (See Table 1). More females (84.2%) than males (14.5%) completed the pretest. The majority were Caucasian (63.8%), with African Americans representing approximately 22.2% of the sample. Only 6.8% of the sample reported having a Latino background and the majority of participants were based in an urban area (85.1%) compared to 12.7% in rural areas.

For those 66 participants who completed both the pretest and posttest, the relative proportions for gender and race were similar to the pretest. More females (81.8%) than males (18.2%) and a greater percentage of Caucasians (68.2%) than African-Americans (22.7%) completed the post-test. Asian Americans representing only 7.6% of the sample and only 4.5% of the sample reported having a Latino background. Similarly, more

participants from urban areas (83.3%) compared to those from rural areas (16.7%) completed the post-test.

Table 1

Frequencies and Percentages of Demographic Variables for All Participants (N = 221) and Finishers (N = 66)

Variable	<u>All Participants</u>		<u>Finishers</u>	
	Frequency	%	Frequency	%
Gender				
Female	186	84.2	54	81.8
Male	32	14.5	12	18.2
Transgender	1	0.5	0	0.0
Ethnicity				
American Indian/Alaska Native	2	0.9	0	0.0
Asian	15	6.8	5	7.6
Black or African American	49	22.2	15	22.7
White	141	63.8	45	68.2
Mixed/Other	5	2.3	0	0.0
Latino				
No	199	90.0	61	92.4
Yes	15	6.8	3	4.5
Setting				
Rural	28	12.7	11	16.7
Urban	188	85.1	55	83.3

Note: Frequencies not adding to 221 and 66, and percentages not adding to 100, reflect missing data.

As shown in Table 2, the majority of participants reported their profession as nurses (62.0%) and advanced practice nurses made up 15.8% of the sample. The most common primary role function of the participants was care provider/clinician (50.7%), with teacher/faculty as the next most common role function (12.7%). More than 85% reported that their employment setting was not a faith based organization, and the majority reported that their agency received Ryan White CARE Act funding (42.5%). The majority of participants reported that they worked in a hospital or hospital-based clinic (62.9%), followed by college/university (11.8%). While the majority reported that they do not see HIV/AIDS patients (24.9%), the most frequently chosen service for HIV/AIDS patients by participants was to provide all medical care and refer/transfer when antiretroviral treatment fails (21.7%). In addition, refer/transfer HIV positive patients for all medical care was chosen by 21.7% of participants, followed by provide primary care and refer/transfer HIV positive patients for HIV treatment only (19.5%). Only 8.6% of participants reported that their most provided service was to provide all HIV treatment and refer/transfer for primary care.

The relative proportions for profession/discipline and primary role function in the posttest were similar to the pretest. Similarly, more participants reported that their employer was not a faith based organization (86.4%) and received Ryan White CARE Act funding (39.4%). Hospital or hospital based clinic were also the most common employment setting (63.6%). Unlike the pretest, the most provided service was to provide primary care and refer/transfer HIV positive patients for HIV treatment only (30.3%).

Table 2

*Frequencies and Percentages of Profession Variables for All Participants (N = 221)
and Finishers (N = 66)*

Variable	<u>All Participants</u>		<u>Finishers</u>	
	Frequency	%	Frequency	%
Profession/Discipline				
Advanced Practice Nurse	35	15.8	17	25.8
Nurse	137	62.0	31	47.0
Nurse Practitioner	15	6.8	7	10.6
Physician	16	7.2	6	9.1
Physician Assistant	2	0.9	0	0.0
Social Worker	2	0.9	2	3.0
Other	8	3.6	2	3.0
Primary Role Function				
Administrator/Supervisor	18	8.1	4	6.1
Care Provider/Clinician	112	50.7	35	53.0
Case Manager	16	7.2	5	7.6
Researcher	7	3.2	0	0.0
Teacher/Faculty	28	12.7	13	19.7
Student/Graduate Student	5	2.3	2	3.0
Other	23	10.4	4	6.1
Faith Based Organization				
Don't Know	16	7.2	6	9.1
No	188	85.1	57	86.4
Yes	11	5.0	2	3.0
Ryan White CARE Act Funding				
Don't Know	69	31.2	19	28.8
No	51	23.1	19	28.8
Yes	94	42.5	26	39.4

Note: Frequencies not adding to 221 and 66, and percentages not adding to 100, reflect missing data.

Table 2, continued

*Frequencies and Percentages of Profession Variables for All Participants (N = 221)
and Finishers (N = 66)*

Variable	All Participants		Finishers	
	Frequency	%	Frequency	%
Principal Employment Setting				
College/University	26	11.8	10	15.2
Community/Migrant Health Center	4	1.8	2	3.0
Hospital or Hospital-Based Clinic	139	62.9	42	63.6
Solo/Group Private Practice	10	4.5	4	6.1
Other Community-Based Service Org. (CBO)	8	3.6	1	1.5
Other Health Care	2	0.9	1	1.5
Other Public Health Agency	2	0.9	0	0.0
State/Local Health Department	7	3.2	0	0.0
Substance Abuse Treatment Program	2	0.9		
Other	14	6.3	5	7.6
Most Often Provided Services for HIV/AIDS Patients				
Not applicable/Do not see patients	55	24.9	18	27.3
Provide all HIV treatment and refer/transfer for primary care	19	8.6	9	13.6
Provide all medical care and refer/transfer when antiretroviral treatment fails	48	21.7	8	12.1
Provide primary care and refer/transfer HIV+ patients for HIV treatment only	43	19.5	20	30.3
Refer/transfer HIV+ patients for all medical care	48	21.7	10	15.2

Note: Frequencies not adding to 221 and 66, and percentages not adding to 100, reflect missing data.

While 52 of the 221 participants reported that they did not know approximately how many of their clients or patients in the past year were HIV positive, from those who reported an approximate number, the average number of HIV positive patients seen in the past year was 35 ($M = 34.88$, $SD = 82.15$), with a range of 0 to 600. Similarly, for only those participants who completed the posttest, 16 of the 66 participants reported that they did not know approximately how many of their clients or patients in the past year were HIV positive. For those who reported an approximate number, the average number of HIV positive patients seen in the past year was 32 ($M = 32.21$, $SD = 105.93$), with a range of 0 to 600 (See Table 3).

Table 3 also shows the number and percentage of all participants, as well as the posttest only participants who reported the range of their HIV positive patients who were racial or ethnic minorities, on antiretroviral therapy, severely or persistently mentally ill, substance abusers, uninsured, women, and incarcerated or parolees. While the majority of participants reported not knowing the percentage of their patients for these categories, most (24.0%) reported that greater than 75% of their HIV positive patients were of a racial or ethnic minority. Also, the majority of participants (22.6%) reported that greater than 75% of their HIV positive patients were on antiretroviral therapy. The majority of participants (25.3%) also reported that greater than 75% of their HIV positive patients were uninsured, while the majority (25.3%) reported 1 – 24% of their patients were mentally ill. Similarly, most (18.1%) reported that 1 – 24% of their patients were substance abusers, and 18.1% reported that 25 – 49% of their patients were women.

Table 3

Frequencies and Percentages of HIV Patient Variables for All Participants (N = 221) and Finishers (N = 66)

Variable	<u>All Participants</u>		<u>Finishers</u>	
	Frequency	%	Frequency	%
Percentage of HIV Patients in the past year who were:				
Racial & Ethnic Minorities				
None	7	3.2	2	3.0
1-24%	25	11.3	3	4.5
25-49%	18	8.1	3	4.5
50-74%	32	14.5	8	12.1
> 75%	53	24.0	22	33.3
Don't Know	55	24.9	17	25.8
On Antiretroviral Therapy				
None	8	3.6	2	3.0
1-24%	20	9.0	3	4.5
25-49%	19	8.6	7	10.6
50-74%	27	12.2	8	12.1
> 75%	50	22.6	15	22.7
Don't Know	66	29.9	20	30.3
Mentally Ill				
None	49	22.2	14	21.2
1-24%	56	25.3	17	25.8
25-49%	11	5.0	3	4.5
50-74%	7	3.2	2	3.0
> 75%	4	1.8	0	0.0
Don't Know	62	28.1	19	28.8

Note: Frequencies not adding to 221 and 66, and percentages not adding to 100, reflect missing data.

Table 3, continued

*Frequencies and Percentages of HIV Patient Variables for All Participants (N = 221)
and Finishers (N = 66)*

Variable	<u>All Participants</u>		<u>Finishers</u>	
	Frequency	%	Frequency	%
Substance Abuser				
None	17	7.7	6	9.1
1-24%	40	18.1	11	16.7
25-49%	30	13.6	8	12.1
50-74%	29	13.1	7	10.6
> 75%	11	5.0	3	4.5
Don't Know	63	28.5	20	30.3
Uninsured				
None	21	9.5	9	13.6
1-24%	26	11.8	7	10.6
25-49%	7	3.2	1	1.5
50-74%	22	10.0	5	7.6
> 75%	56	25.3	17	25.8
Don't Know	59	26.7	17	25.8
Women				
None	21	9.5	8	12.1
1-24%	37	16.7	5	7.6
25-49%	40	18.1	8	12.1
50-74%	11	5.0	1	1.5
> 75%	35	15.8	20	30.3
Don't Know	47	21.3	14	21.2
Incarcerated				
None	65	29.4	21	31.8
1-24%	56	25.3	19	28.8
25-49%	8	3.6	1	1.5
50-74%	4	1.8	0	0.0
> 75%	1	0.5	1	1.5
Don't Know	55	24.9	13	19.7

Note: Frequencies not adding to 221 and 66, and percentages not adding to 100, reflect missing data.

Due to the low number of participants for some levels of the various demographic variables, further analyses could only include certain groups. Only one individual reported being transgender, thus only males and females were included in gender analyses. Only African Americans and Caucasians could be included in any ethnicity analyses. Because only three individuals who completed the posttest reported being Latino, no further analyses were conducted examining this variable. Similarly, no further analyses were conducted on the faith-based organization variable, primary functional role, and principal employment setting, due to low cell size in some of the levels. Only nurses and advanced practice nurses could be compared for profession. In addition, due to the low cell sizes in many of the groups, no interactions between these variables on any of the dependent measures (pre and post knowledge scores, perceived self-efficacy, satisfaction) were conducted.

Finishers versus Non Finishers

Independent Samples *t* tests revealed that finishers and non-finishers did not significantly differ on their pretest knowledge scores, pretest perceived efficacy scores, or the number of patients with HIV/AIDS last year (all *ts*, *ns*). In addition, nonparametric chi-square (χ^2) tests showed no significant associations between finishers and non finishers with any of the following demographic or profession variables; gender, ethnicity, Latino/Hispanic, setting, faith-based organization, Ryan White CARE Act funding, services, profession/discipline, primary functional role, principal employment setting, and the percentages of patients who were racial or ethnic minorities, on

antiretroviral therapy, severely or persistently mentally ill, substance abusers, uninsured, women, and incarcerated or parolees (all χ^2 s, *ns*). Thus, further analyses were conducted on the 66 participants who completed the study.

Knowledge

Knowledge scores for the pretest and the posttest were calculated for each participant as the total number of items answered correctly, with a maximum score of 12. As shown in Table 4, paired samples *t* tests of the knowledge scores revealed that posttest knowledge scores were significantly greater at the end of the study ($M = 9.21$, $SD = 1.89$) than at the beginning ($M = 8.53$, $SD = 1.85$).

Table 4

Average Knowledge Scores for Pretest and Posttest (N=66)

Variable	Mean	SD	<i>t</i>	<i>p</i>
Correct Scores			-2.67	.01
Pretest	8.53	1.85		
Posttest	9.21	1.89		

Pearson product moment correlations were also conducted to examine the relationship between the continuous demographic variables; number of HIV positive patients in the past year, and hours to complete the CD-ROM with the pre and post

knowledge scores, as well as with gain scores. Specifically, the number of HIV/AIDS patients treated in the past month was not significantly related to either the pretest or posttest knowledge scores (all *rs*, *ns*). While number of hours to complete the CD-ROM training was not significantly correlated to the pretest knowledge scores, $r(65) = .089$, *ns*, the number of hours a participant took to complete the CD-ROM training was significantly related to posttest knowledge scores, $r(65) = .244$, $p < .05$. Therefore, indicating that the more hours one spent to complete the CD-ROM training, they answered a greater number of correct items on the posttest.

A series of Analyses of Covariance (ANCOVAs), controlling for pretest knowledge scores were conducted on posttest knowledge scores to test for differences between the levels of the various demographic variables. No significant differences were found between nurses and advanced practice nurses, care providers/clinicians and teachers/faculty, males and females, as well as African Americans and Caucasians (all *F*s, *ns*).

An ANCOVA was also conducted to examine the impact of job setting (i.e., Urban vs. Rural) on knowledge scores. Again, the pretest knowledge scores were used as covariates to control for any pre existing knowledge. As shown in Figure 1, the results revealed a significant effect for job setting, $F(1,63) = 7.94$, $p < .01$, indicating that those in urban settings had greater posttest knowledge scores ($M = 9.55$, $SD = 1.26$) than those in rural settings ($M = 7.54$, $SD = 3.30$).

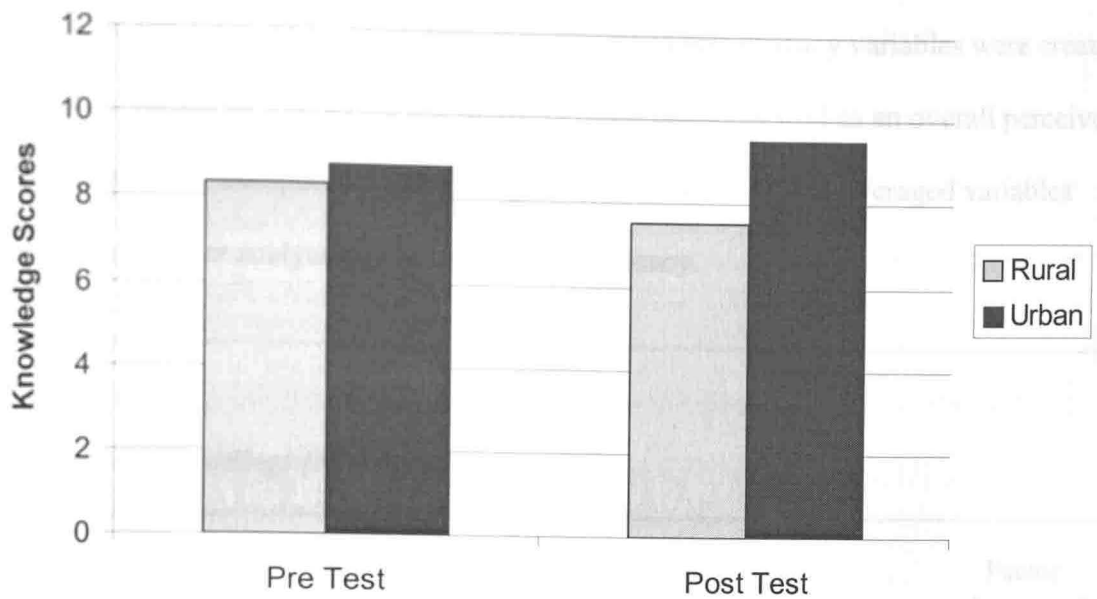


Figure 1. Pre and post knowledge scores for participants in urban and rural settings.

Perceived Self-Efficacy

An exploratory factor analysis was conducted on all participants' pretest scores to identify any common themes in the 17 perceived self-efficacy items. The factor analysis revealed two factors. All of the perceived self-efficacy items loaded on the same factor, except the items measuring computer navigational skills and using a CD-ROM to obtain continuing education. Because the 15 items loading on factor one seemed to address perceived self-efficacy toward HIV/AIDS concepts, this factor was called "HIV/AIDS Concepts." Since the two items loading on factor two dealt more with perceived self-efficacy toward computer skills, this factor was called "Computer Skills" (See Table 5).

Inter-item analyses were excellent, HIV/AIDS Concepts Cronbach's $\alpha = .961$; Computer Skills Cronbach's $\alpha = .881$. Therefore, two perceived self-efficacy variables were created for pre and posttest by averaging the items for each factor, as well as an overall perceived self-efficacy score, computed as an average of all 17 items. These averaged variables were used in further analyses of perceived self-efficacy.

Table 5

Rotated Factor Loadings (N = 66)

Item	Item Name	Factor	
		1	2
1	discuss the dynamics of HIV infection	.828	.016
2	discuss implications for care related to HIV	.785	.066
3	identify the different stages of HIV disease	.875	-.036
4	describe implications for care of HIV prevention	.726	.089
5	define responsibilities of provider in HIV cases	.775	.033
6	list essential components of HIV pre/post counseling	.768	.073
7	recognize components of conducting HIV risk assessments	.771	.163
8	identify when HIV testing should be recommended	.734	.258
9	conduct a comprehensive initial visit with an HIV-infected client	.851	-.099
10	identify essential laboratory tests needed in initial patient visit	.814	-.107
11	discuss considerations for initiation of antiretroviral therapy	.837	-.082
12	describe importance of adherence to antiretroviral therapy	.846	.020
13	identify important health maintenance issues	.860	.128
14	computer navigational skills	.024	.929
15	use a CD-ROM to obtain continuing education	.003	.920
16	confident to provide healthcare services to people with HIV	.815	-.051
17	competence level to provide healthcare services to people w/ HIV	.806	-.066

Note: Varimax Rotation with Kaiser Normalization. Eigenvalues in bold represent the highest factor loading for each item.

As shown in Table 6, Paired Samples t tests revealed significant differences from pretest to posttest for Total Self-Efficacy, $t(66) = -11.23, p < .01$, HIV/AIDS Concepts, $t(66) = -11.47, p < .01$, but not for Computer Use, $t(66) = -1.68, ns$. Participants had greater perceived self-efficacy after completing the program ($M = 5.23, SD = .89$) than at the beginning of the study ($M = 3.98, SD = .98$). Moreover, perceived self-efficacy for HIV/AIDS Concepts increased from the beginning of the study ($M = 3.79, SD = 1.10$) to the end of the study ($M = 5.18, SD = .99$), whereas perceived self-efficacy toward their Computer Skills remained relatively unchanged (pre $M = 5.39, SD = 1.26$; post $M = 5.57, SD = 1.18$).

Additional Paired Samples t tests of pre and post scores for the 17 individual perceived self-efficacy items revealed that posttest scores were significantly greater than pretest scores for all of the perceived self-efficacy items (all $ts, p < .01$), except the items addressing how well the participants thought their computer navigational skills were, and how well they could use a CD-ROM to obtain continuing education (all ts, ns). Indicating that for items related to HIV/AIDS concepts, perceived self-efficacy increased after completing the CD-ROM training, but items related specifically to computer skills did not show an increase in perceived self-efficacy after completing the CD-ROM. Specifically, examining the individual item “how well can you use a CD-ROM to obtain continuing education, participants had marginally greater perceived self-efficacy scores at the end of the study ($M = 5.62, SD = 1.19$) than at the beginning ($M = 5.39, SD = 1.33$), $t(66) = -1.81, p = .075$ (See Table 7).

Table 6

Average Scores for Perceived Self-Efficacy, Perceived Self-Efficacy toward HIV/AIDS Concepts, and toward Computer Use (N=66)

Variable	Mean	SD	<i>t</i>	<i>p</i>
Total Self-Efficacy				
Pretest	3.98	.98	-11.23	.00
Posttest	5.23	.89		
HIV/AIDS Concepts				
Pretest	3.79	1.10	-11.47	.00
Posttest	5.18	.99		
Computer Use				
Pretest	5.39	1.26	-1.68	.10
Posttest	5.57	1.18		

Pearson's Product Moment Correlations between initial perceived self-efficacy scores and initial knowledge scores are shown in the top half of Table 8. While both subscales, HIV/AIDS Concepts, $r(206) = .991, p < .01$ and Computer Skills, $r(206) = .199, p < .01$, were significantly correlated to baseline overall self efficacy scores, self-efficacy toward HIV/AIDS Concepts and Computer Skills were not significantly correlated, $r(206) = .064, ns$. Overall self-efficacy, as well as both subscales, were significantly positively correlated, although small (Cohen & Cohen, 1975) with baseline knowledge scores, indicating that an increased self-efficacy is related to an increased knowledge score, and vice versa.

Table 7

Average Pretest and Posttest Scores for Individual Perceived Self-Efficacy Items (N=66)

Variable	Mean	SD	<i>t</i>	<i>p</i>
Discuss Dynamics of HIV Infection				
Pretest	3.88	1.31	-7.60	.000
Posttest	5.05	0.83		
Implications for HIV Transmission				
Pretest	4.00	1.23	-6.99	.000
Posttest	5.15	1.13		
Identify the Different Stages of HIV				
Pretest	3.38	1.42	-9.50	.000
Posttest	4.95	0.97		
Implications for HIV Prevention				
Pretest	4.11	1.30	-5.87	.000
Posttest	5.28	1.19		
Responsibilities of Health Care Provider				
Pretest	3.91	1.30	-8.21	.000
Posttest	5.39	1.12		
Essential Components of Counseling				
Pretest	3.23	1.40	-11.15	.000
Posttest	5.09	1.11		
Components of HIV Risk Assessment				
Pretest	3.82	1.33	-10.31	.000
Posttest	5.35	1.02		
When to Recommend HIV Test				
Pretest	4.59	1.37	-7.90	.000
Posttest	5.82	1.15		
Comprehensive Initial Visit				
Pretest	3.42	1.53	-7.82	.000
Posttest	4.91	1.15		

Table 7, continued

Average Pretest and Posttest Scores for Individual Perceived Self-Efficacy Items (N=66)

Variable	Mean	SD	<i>t</i>	<i>p</i>
Essential Lab Test Needed				
Pretest	3.35	1.54		
Posttest	5.08	1.29	-9.46	.000
Considerations of Antiretroviral Therapy				
Pretest	2.89	1.48		
Posttest	4.79	1.13	-11.61	.000
Adherence of Antiretroviral Therapy				
Pretest	4.12	1.56		
Posttest	5.42	1.28	-7.21	.000
Identify Health Maintenance Issues				
Pretest	4.14	1.38		
Posttest	5.50	1.15	-8.04	.000
Computer Navigational Skills				
Pretest	5.38	1.29		
Posttest	5.52	1.27	-1.14	.260
Use CD-ROM to Obtain Training				
Pretest	5.39	1.33		
Posttest	5.62	1.19	-1.81	.075
Confidence to Provide Services				
Pretest	4.08	1.38		
Posttest	5.06	1.08	-7.17	.000
Competence Level to Provide Services				
Pretest	4.02	1.33		
Posttest	4.92	1.09	-7.04	.000

Table 8

Pearson Product Moment Correlations between Initial Perceived Self-Efficacy and Initial Knowledge Scores (N = 206) and between Final Perceived Self-Efficacy and Final Knowledge Scores (N = 66)

	Concepts	Computer	Knowledge
Initial			
Initial Overall Self-Efficacy	.991**	.199**	.272**
Initial HIV AIDS Concepts		.064	.250**
Initial Computer Skills			.195**
Final			
Final Overall Self-Efficacy	.990**	.532**	.495**
Final HIV/AIDS Concepts		.407**	.486**
Final Computer Skills			.287**

Note. * $p < .05$; ** $p < .01$

Pearson's Product Moment Correlations between final perceived self-efficacy scores and final knowledge scores are shown in the bottom half of Table 8. Similar to the baseline correlations, both subscales, HIV/AIDS Concepts, $r(66) = .990$, $p < .01$ and Computer Skills, $r(66) = .532$, $p < .01$, were significantly correlated to baseline overall

perceived self-efficacy scores. Opposite to the baseline correlations, final perceived self-efficacy toward HIV/AIDS Concepts and Computer Skills were significantly correlated, $r(66) = .407, p < .01$. Overall perceived self-efficacy, as well as both subscales, were significantly positively correlated, and were stronger than baseline correlations (Cohen & Cohen, 1975) with baseline knowledge scores, indicating that an increased final perceived self-efficacy is related to an increased final knowledge score, and vice versa.

Additional Pearson's Product Moment Correlations showed no significant relationships between the final perceived self-efficacy scores and the number of HIV/AIDS patients seen in the last year, all r s, ns . The number of hours spent to complete the CD-ROM training was also not significantly correlated with final overall perceived self-efficacy or final perceived self-efficacy toward HIV/AIDS Concepts. However, the number of hours spent to complete the training program, was significantly negatively correlated with final perceived self-efficacy scores toward computer skills. As expected, the greater number of hours spent to complete the training was related to a decrease in perceived self-efficacy towards computer skills, and vice versa (See Table 9).

HIV/AIDS Test Items

Chi square tests revealed that participants were more likely to choose the correct answer than an incorrect answer for all pretest and posttest items ($p < .05$), except item #9 on the pretest, asking which immunizations should "Lacey" have. The majority of participants answered "all of the above" (Varicella vaccine, Hepatitis B vaccine, Pneumococcal vaccine, and Measles, Mumps, and Rubella vaccine), followed by

"Varicella," and "Pneumococcal." The correct answer was "both Hepatitis B vaccine and Pneumococcal vaccine," which was answered correctly by only six participants.

Table 9

Pearson Product Moment Correlations between Number of HIV/AIDS Patients Seen in the Last Year and Hours Spent to Complete Educational Training Program with Post Perceived Self-Efficacy Scores (N = 66)

	Number of Patients	Hours
Final Overall Self-Efficacy	.169	-.013
Final HIV/AIDS Concepts	.184	.044
Final Computer Skills	-.033	-.312*

Note. * $p < .05$; ** $p < .01$

Satisfaction

As shown in Table 10, participants in the study were relatively satisfied (almost 6 on the 7-point Likert scale) with various aspects of the CD-ROM, including the graphics ($M = 5.80$, $SD = 1.18$), readability of the font size ($M = 5.98$, $SD = 1.01$), visual appearance of the content information ($M = 5.83$, $SD = 1.14$), sound quality ($M = 5.95$,

$SD = 1.04$), design of the layout ($M = 5.72$, $SD = 1.38$), and the ability to navigate throughout the sections ($M = 5.89$, $SD = 1.06$).

Participants also reported being highly likely to take another HIV educational CD-ROM ($M = 5.95$, $SD = 1.30$) and that they would recommend this HIV educational CD-ROM to other healthcare professionals ($M = 6.05$, $SD = 1.15$). Participants reported that the educational program moderately changed their feelings for caring for people living with HIV ($M = 3.68$, $SD = 2.05$). Participants also reported that the information presented on the CD-ROM was culturally appropriate ($M = 5.82$, $SD = 1.12$) and that they were highly satisfied that the content of the CD-ROM would help them care for people living with HIV in a more culturally sensitive manner ($M = 5.34$, $SD = 1.42$) (See Table 10).

Only 15 participants reported having attended any HIV related educational program that increased their HIV knowledge since completing the pretest. However, independent samples t tests between those individuals who had attended an HIV related educational program and those who did not, revealed that the two groups did not differ on their posttest knowledge or perceived self efficacy scores, all ts , ns . In addition, eight of the 15 participants discussed above, as well as an additional five participants, reported that there had been an event in their life since the pretest other than the educational program that increased their HIV knowledge. Similarly, independent samples t tests between those individuals who had an event and those who did not, revealed that the two

groups did not differ on their posttest knowledge or perceived self efficacy scores, all *ts*,

ns.

Table 10

Descriptive Statistics for Post Satisfaction Items (N=65)

Item	Mean	SD	Range
Satisfaction with:			
Graphics	5.80	1.18	3 – 7
Font Size	5.98	1.01	4 – 7
Visual Appearance	5.83	1.14	3 – 7
Sound	5.95	1.04	3 – 7
Layout Design	5.72	1.38	2 – 7
Ability to Navigate	5.89	1.06	3 – 7
Likely to Do Again	5.95	1.30	2 – 7
Would Recommend Others	6.05	1.15	2 – 7
Overall Satisfaction	5.95	1.22	2 – 7
Changed Feelings	3.68	2.05	1 – 7
Culturally Appropriate	5.82	1.12	3 – 7
Care in Culturally Sensitive Manner	5.34	1.42	1 – 7
Teach Resources Used Effectively	5.82	1.12	3 – 7
Impact on Approaching Patients	5.48	1.56	1 – 7
Address Needs	5.83	1.32	1 – 7
Worth Time	6.00	1.20	2 – 7
Recommend	6.11	1.30	1 – 7
Free of Commercial Bias	6.42	.97	3 – 7
Objectives Related to Goal	6.34	.91	3 – 7
Hour to Complete Training	5.29	6.92	1 - 40

Participants reported that it took them an average of almost five and a half hours to complete the educational training program ($M = 5.29$, $SD = 6.92$). Participants in the present sample reported that the teaching/learning resources were relatively appropriate and effective ($M = 5.82$, $SD = 1.12$), and that it had an impact on the way they approach their patients ($M = 5.48$, $SD = 1.56$), as well as the activity addressed their professional needs ($M = 5.83$, $SD = 1.32$). They also reported that this activity was worth their time and effort ($M = 6.00$, $SD = 1.20$) and that they would recommend this CD-ROM to their peers ($M = 6.11$, $SD = 1.30$). Participants reported that the activity was free of commercial bias ($M = 6.42$, $SD = .97$) and that the objectives were related to the overall purpose or goal of the activity ($M = 6.34$, $SD = .91$) (See Table 10).

Qualitative Information

The participants were asked to answer some open-ended questions for the researcher to acquire more detailed information regarding issues and feelings participants encountered during this educational program. The open-ended questions to attain qualitative data and a summary of the responses follow.

Qualitative Question 1. If not satisfied with the educational CD-ROM, please tell us what problems you encountered.

While the satisfaction ratings with the educational CD-ROM were high, it was important to extrapolate information regarding problems participants may have encountered. Only 11 participants responded and provided an example of a problem with the CD-ROM. The problems were related to technical issues such as (a) the inability to

minimize the screen, (b) sounds, (c) graphics, (d) inability to open Web links in a new window and print easily, and (e) difficulty with navigating back and forth through the tables and large amount of supplemental information. In addition, one person reported they were "*stuck in some places and had to reload and start over.*" However, this could have been a problem related to the participant's personal computer. Two participants contacted the research team because a technical problem with the CD-ROM product required it be replaced.

Qualitative Question 2a. Has this educational program changed your feelings about caring for people living with HIV?

The participants answered this question by rating on a 7 point likert type scale with options ranging from *not changed at all* to *highly changed*. Participants reported that the educational program *moderately changed* their feelings for caring for people living with HIV

Qualitative Question 2b. If so, how has it changed?

Twenty-three participants provided examples of how this educational program changed their feelings toward the care of people living with HIV. This question required the participants to reflect upon about their attitudes towards people living with HIV. Three themes emerged from this probing question. The themes that resounded in these responses were (a) awareness/increased awareness, (b) confidence/ more confidence, and (c) knowledge/increased knowledge.

Participants discussed awareness in a variety of ways. One person noted awareness of their own personal *"need to be more confident and supportive in approaching HIV patients."* Some individuals noted clinical practice changes and increased awareness of the numbers of individuals that are HIV infected. One example of system change was noted by a participant. Systems change is "a clear mention by the trainee that different procedures and guidelines are being followed due to the information acquired during the training" (Henderson et al., 1999, p.415). The participant noted that *"health maintenance concerns and risk assessment screening is much more likely in my practice when evaluating patients."* This is consistent with the findings in one study (Henderson et al., 1999) in which more than half of the participants provided at least one example of a system change as a result of an HIV/AIDS training program.

The theme of confidence resonated over and over again. Participants noted *"being able to talk to and treat patients"*, *"now I feel confident"*, and *"more able to explain to my patients about their conditions."* Some respondents noted changes in both confidence and knowledge. One person wrote *"I feel more confident in my knowledge level and more willing to address their concerns"*. Another wrote, *"I feel more comfortable with my knowledge level of the disease, its course and the therapy for this patient population. I have not had any issues with this patient population other than feeling that I didn't have the knowledge base that I would have liked."* These statements are also evidence of increased self-efficacy regarding the care of people living with HIV.

The increase in knowledge and confidence noted by participants is consistent with the assertion of many HIV continuing education programs that are based on the assumption that improving knowledge will also increase confidence, satisfaction with skills, and willingness to treat people living with HIV/AIDS (All & Sullivan, 1997; Dimick, Levinson, Manteuffel, & Donnellan, 1996; Gallagher, 1996; Irving, Ferguson, Cox, & Farnsworth, 1997; Wyness & Goldstone, 1998). In this study, 10 out of the 23 participants that responded to this question either used or referred to the term “increased knowledge” in comments regarding how their feelings had changed as a result of this CAI CD-ROM program.

Qualitative Question 3. What other features would you like to see added to this educational program (CD-ROM)?

The participants gave a rich array of suggestions for improvements in future versions of the CD-ROM. The suggestions relate to content, presentation, and ideas for new CAI CD-ROMs developed specifically for special target populations and issues. The complete list of suggestions is stated in the Recommendations section, below.

Research Questions

Research Question 1. Is CAI an effective strategy among healthcare professionals to gain knowledge on the topic of HIV/AIDS?

Paired Samples *t* tests revealed that participant’s posttest knowledge scores were significantly greater than their pretest knowledge scores. Thus, this computer assisted

instruction CD-ROM was found to be an effective strategy to educate and train healthcare professionals in the specialty of HIV/AIDS for this group of participants.

Research Question 2. Is gain of knowledge different for participants of various healthcare professional job functions, employment settings, work locations, gender, ethnicity, and HIV+ patient volume?

ANCOVAs, controlling for pretest knowledge scores showed that this group of healthcare professionals were not different on posttest knowledge scores based on their professional position, job function, employment setting, work location, gender, ethnicity, or HIV+ patient volume. Differences were found between rural and urban participants, such that controlling for pretest knowledge scores, urban participants had significantly greater posttest knowledge scores than rural participants.

Research Question 3. Will healthcare professionals have a statistically significant difference in perceived self-efficacy to care for people living with HIV after completing the "HIV/AIDS Prevention, Early Intervention, and Health Promotion" CAI program?

Paired Sample t tests showed that posttest scores were significantly greater than pretest scores for overall perceived self-efficacy and items focusing on HIV/AIDS related concepts.

Research Question 4. Will the participants' perceived self-efficacy to utilize a CAI CD-ROM approach for continuing education change after the completion of the "HIV/AIDS Prevention, Early Intervention, and Health Promotion" CAI program?

Paired Samples *t* tests showed there was no statistically significant difference between pretest and posttest scores on the participant's perceived self-efficacy to utilize a CAI CD-ROM approach for the purpose of continuing education as a result of the educational intervention.

Research Question 5. What is the level of satisfaction among the participants using this CAI strategy to obtain continuing education? Satisfaction is measured in terms of utility, format, aesthetics and cultural appropriateness of the CD ROM.

Descriptive statistics showed that this sample of healthcare professionals reported satisfaction with this CAI strategy to obtain continuing education. This statement is based on the results a satisfaction survey the participants completed at the end of the posttest. The participants were also able to provide some suggestions to change and improve this educational strategy.

Summary

The present program evaluation showed that this CAI CD-ROM was an effective educational strategy to increase knowledge in a group of healthcare professionals on the topic of HIV/AIDS prevention, early intervention and health promotion. This evaluation research study also demonstrates increased perceived self-efficacy towards HIV/AIDS concepts on the posttest self-appraisal (self-efficacy) survey. Differences were also found on final posttest knowledge scores for participants who were from urban and rural settings. Chapter 5 further discusses these findings and their implications.

CONCLUSIONS AND RECOMMENDATIONS

HIV/AIDS has become one of the largest public health concerns in the world today. Disproportionate effects of the virus are evident in the African American community, particularly with minority women (Kaiser Family Foundation, 2004c). While the death rates related to HIV/AIDS decreased in the late 1990s, as a result of the medical advances with treatments, the HIV/AIDS diagnosis rates continue to rise (CDC, 2005b).

The importance of and necessity for healthcare professionals to be educated and trained to identify individuals at risk for HIV/AIDS and to care for the increasing population of people living with HIV/AIDS is undeniable. The utilization of educational strategies that are accessible, convenient, affordable, interactive, and learner-centered is the key to successful educational programs for healthcare professionals (Davis et al., 1995; Davis et al., 1999; Gallagher, 1996; Gandsas & McIntire, 2002). There isn't one educational strategy that is appropriate for all individuals. Because people learn differently, varied types of educational methods should be available to meet the needs of different learners. Therefore, the team that develops, designs, and plans educational programs should perform a needs assessment of the target audience that includes asking their preferences for continuing education activities in terms of traditional vs. non-traditional strategies.

Computer assisted instruction strategies for healthcare professional continuing education have been proven to be as effective as traditional educational strategies (Wutoh et al., 2004). It appears that some healthcare professionals prefer one over the other strategy for various reasons. Obviously, individuals that lack the knowledge, ability, and skill to utilize the computer will not prefer a CAI strategy (Charles & Mamary, 2002; Hegge et al., 2002). In contrast, individuals that are computer and technology savvy, or those who have limited time for travel to national conferences, may prefer the convenience of accessing CAI activities (McKillen, 2002). This chapter will summarize findings and discuss conclusions of this evaluation research study. The implications for health education and recommendations for future evaluation research studies and educational programs will also be reviewed.

Summary

This quasi-experimental research study was conducted to evaluate an educational CD-ROM program that was developed for healthcare professionals. The study utilized a pretest/posttest design and incorporated short answer, open-ended questions to obtain qualitative information. The primary purpose of this evaluation research project was to evaluate the effectiveness and participant satisfaction of the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” educational CD-ROM product. The secondary purpose was to evaluate effectiveness of CAI as a HIV/AIDS training strategy for health care professionals seeking continuing education. This study also examined the healthcare professionals’ perceived self-efficacy (a) to utilize the educational CD-ROM approach

for continuing education, and (b) to care for people living with HIV after completing the CD-ROM.

Study participants were recruited through emails, flyers, listservs, announcements, professional organization newsletters, and the Association of Nurses in AIDS Care web site. There were 221 participants that initially entered the study by taking the pretest online that was posted and maintained by Elite Research. Elite Research is an online research company owned and operated by a university statistician consultant and computer expert.

The final study sample of usable participants that completed the posttest online was 66 healthcare professionals from across the United States. The sample of participants came from over 30 different zip codes, representing nurses, nurse practitioners, advanced practice nurses, physicians and physician assistants. The findings are based on data collected and statistical analysis conducted with SPSS 12.0 by comparing the pretest and posttest case study scores, comparing the pretest and posttest self-appraisal survey information, and analyzing the results from the demographic profile and satisfaction survey.

Conclusion

There were five research questions addressed in this study regarding the effectiveness of CAI as an education strategy for healthcare professionals on the topic of HIV/AIDS for continuing education. This section will provide the research question and a brief summarized response based on the conclusions from the findings of this study.

1. Is CAI an effective strategy among healthcare professionals to gain knowledge on the topic of HIV/AIDS?

Based on the findings of this research study, this group of participants found this computer assisted instruction CD-ROM to be an effective strategy to educate and train healthcare professionals in the specialty of HIV/AIDS. The participants demonstrated a statistically significant gain in knowledge when comparing the pretest and posttest case study scores. Fifty of the 66 research study participants passed the posttest on the first attempt. Therefore, the participants who failed were given the option to retake the case study portion of the posttest to obtain the CEU/CME certificate. Five participants retook the posttest case study, 3 passed the test and 2 failed on the second attempt. Thus, a total of 53 participants earned a CEU/CME certificate or completion of the program certificate.

2. Is gain of knowledge different for participants of various healthcare professional job functions, employment settings, work locations, gender, ethnicity, and HIV+ patient volume?

As previously stated, there was a statistically significant difference in the knowledge scores when comparing the pretest with the posttest. This group of healthcare professionals did not show a difference in the pretest and posttest knowledge scores based on their professional position, job function, employment setting, work location, gender, ethnicity, or HIV+ patient volume.

3. Will healthcare professionals have a statistically significant difference in perceived self-efficacy to care for people living with HIV after completing the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” CAI program?

This evaluation research study was able to demonstrate a statistically significant difference in a sample of healthcare professionals’ perceived self-efficacy to care for people living with HIV after completing an educational strategy treatment/intervention. Participants were also able to give specific examples of how this educational program changed their feelings about caring for people with HIV.

4. Will the participants’ perceived self-efficacy to utilize a CAI CD-ROM approach for continuing education change after the completion of the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” CAI program?

While the participants did show an increase in self-efficacy to care for people living with HIV, there was no statistical significance to demonstrate an increase in the participant’s perceived self-efficacy to utilize a CAI CD-ROM approach for the purpose of continuing education as a result of the educational intervention.

5. What is the level of satisfaction among the participants using this CAI strategy to obtain continuing education? Satisfaction is measured in terms of utility, format, aesthetics and cultural appropriateness of the CD ROM.

This sample of healthcare professionals reported satisfaction with this CAI strategy to obtain continuing education. This statement is based on the results a satisfaction survey the participants completed at the end of the posttest. The participants

were also able to provide some suggestions to change and improve this educational strategy.

Discussion and Implications

This study investigated the healthcare professionals' knowledge, perceived self-efficacy, and overall learner satisfaction after completing a CAI CD-ROM on HIV/AIDS. The participant's knowledge refers to the cognitive domain of learning, which is an essential aspect of any educational program (Gallagher, 1996). Self-efficacy is associated with the healthcare professional's perceived confidence and capability to care for people living with HIV and identifying individuals at risk for HIV (Bandura, 1994). The overall satisfaction with the educational CD-ROM assesses the participant's view as to the performance of the CD-ROM as an educational tool and technical product.

Knowledge

The development of an educational program that will translate into an increase in an individual's knowledge can be a challenging task. The posttest correct scores in this study were significantly greater than the pretest correct scores. This supports the idea that CAI is an effective strategy among healthcare professionals to gain knowledge on the topic of HIV/AIDS. This may be partially explained by the way in which the developers of the CD-ROM addressed two of the challenges discussed by the National Institute of Education (1984) to maximize knowledge gains (cited by Gallagher, 1996). This was accomplished by the HIV educational program objectives being provided at the beginning of the CD-ROM, and the interactive tools utilized in the form of case-studies

and self-quizzes. The effectiveness demonstrated with this CAI CD-ROM educational program, as validated by an increase in knowledge scores, is also consistent with other research studies that have established increased knowledge through an educational program (Curran et al., 2000; Huba et al., 2000b; Messmer et al., 1998; Sowell et al., 1998; Wutoh et al., 2004).

Another explanation for this positive result of increased knowledge could be related to the hybrid format of the CD-ROM. This created a learning environment that provided a large amount of multimedia information for participants to access from the Internet. This is consistent with studies evaluating a hybrid delivery system for physicians in the field of dermatology (Curran et al., 2000), and a CAI program for medical residents on AIDS infection control (Garrett, 1990). These findings are also consistent with Wutoh et al. (2004) that documented an increase in knowledge during a review of 16 research studies that compared traditional and Internet-based continuing education.

In contrast, this study refutes general educational programs discussed in the review of literature (Eagle & Brouard, 1995). This inconsistency in the literature may cause some confusion in the educational arena regarding the most effective strategies for continuing healthcare professional education. Landon et al. (2002) reported that HIV knowledge was linked to the HIV-infected patient caseload of the healthcare professional rather than to the expertise or the area of specialization. However, in this research study, the number of HIV/AIDS patients treated in the past month was not related to the pretest

or posttest case study knowledge scores, or to knowledge gain scores. One postulate to explain this is related to the wide range of caseload numbers in this study. This variation may mask previous knowledge through experience and inaccurately suggest that knowledge gains were related to the content of the educational program.

In this research study, knowledge gain scores are not significantly different between African American and Caucasian participants, males and females, job settings, professions, primary roles, or practice specialties. These results are similar to Liljestrand's (2004), in that demographic variables such as gender, race, practice setting were not predictors for healthcare professionals' continuing education attendance, satisfaction with skills, or willingness to provide HIV care.

Urban participants had significantly greater posttest knowledge scores than rural participants, even after controlling for individual differences of pretest scores. This information validates the importance of and need for rural healthcare professionals to have accessible, affordable, convenient, and flexible HIV educational programs (Suggs et al., 1998). Lewis and Miramontes (1999) found that nurse practitioners in rural areas preferred attending an educational program in their local areas rather than traveling. Therefore, CAI may be an ideal educational strategy for rural healthcare professionals to who wish to be updated regarding the rapidly changing treatment guidelines and recommendations in the specialty of HIV/AIDS.

The number of hours participants spent to complete the educational training program was significantly related to their posttest knowledge scores; an increase in the

number of hours related to an increase in the posttest knowledge score. Conversely, a decrease in the time spent reviewing the CD-ROM was related to a decrease in the posttest knowledge score. Some healthcare professionals may have encountered issues related to limited time to review the CD-ROM for an extended period of time. They may have initially thought this educational program to be a quick and easy way to earn 6 continuing education units or 5 continuing medical education credits.

Perceived Self-Efficacy

Total perceived self-efficacy scores were significantly greater at the end of the study than at the beginning. As described in Chapter 4, the 17 perceived self-efficacy items loaded to create two factors, concepts and computer use. Results show that perceived self-efficacy toward HIV/AIDS concepts was significantly greater at the end of the study than at the beginning.

These findings strongly support the results of a study in which nurses reported increased professional preparedness to care for people living with HIV after an HIV classroom and internship program (Sowell et al., 1998). The findings in both of these research studies resonate with the concept of self-efficacy in the work of Albert Bandura's social cognitive theory. The theory posits that people who function with high levels of self-efficacy promote an environment of confidence, self-satisfaction and insight that they can achieve what they think they can achieve (Bandura, 1994; Pajares, 2002). This theory serves as a framework to explain the association of how the initial perceived self-efficacy scores were significantly related to initial knowledge scores. Also, an

increase in the participant's perceived self-efficacy was related to increased knowledge scores, and a decrease in knowledge scores were related to decreases in perceived self-efficacy. Similarly, final perceived self-efficacy scores were significantly related to final knowledge scores.

However, the participants' perceived self-efficacy toward computer use did not significantly change. This contrasting finding is not surprising. The actual question was, "how well can you use a CD-ROM to obtain continuing education?" The participants had marginally greater perceived self-efficacy scores at the end of the study than at the beginning. To explain this finding, we must observe the participants' pretest perceived self-efficacy scores for this question. At the entrance of this CAI CD-ROM educational program the participant's average score was 5.49, corresponding to above "*pretty well*" on the 7 point likert scale. This is not surprising, because the healthcare professional is volunteering to utilize a CAI method for continuing education. Also, it was not an educational objective of the program to increase the computer skills of the healthcare professionals as a result of completing this CAI CD-ROM.

Another interesting finding is that the number of hours participants spent to complete the educational training program was significantly related to their posttest perceived self-efficacy scores toward computer use. An increase in the number of hours was related to a decrease in the posttest perceived self-efficacy scores toward computer use. Conversely, a decrease in the number of hours spent reviewing the CD-ROM was related to an increase in the posttest perceived self-efficacy scores toward computer use.

This may be explained simply, in that people that have more confidence with computer usage and skills required less time to navigate the CD-ROM and complete the educational program. However, the perceived self-efficacy scores were not significantly related to the number of HIV/AIDS patients treated in the past month.

HIV/AIDS Test Items

Participants were more likely to choose the correct answer than an incorrect answer for all pretest and posttest items except item #9 on the pretest. The question relates to immunizations the HIV/AIDS patient described in the case study should have. The majority of participants answered *all of the above* (Varicella vaccine, hepatitis B vaccine, pneumococcal vaccine, and measles, mumps, and rubella vaccine), followed by *varicella*, and *pneumococcal*.” The correct answer is *both hepatitis B vaccine and pneumococcal vaccine*. Only 24 participants answered this question correctly. Similarly, in a national sample of physicians and nurses, only 30% of the nurses and 61% of the physicians correctly answered a question about HIV and Hepatitis B transmission with a needle stick (Colombotos et al., 1995). There may be some general confusion on the topic of hepatitis among healthcare professionals that do not specialize in infectious disease. Thus, this finding draws attention to the need for continuing education about the important topic.

Satisfaction

The participants were asked to complete a satisfaction survey as part of the posttest. The results verified customer approval and satisfaction with the educational

product and program. This overall positive satisfaction is a significant finding; especially in light of the fact that this is the first edition of the CAI CD-ROM. Participants rated the questions 5, 6, or 7 on a 7 point likert scale, indicating they were satisfied with the various aspects of the CD-ROM. This specifically included the graphics (84.6%), readability of the font size (80.8%), visual appearance of the content information (84.6%), sound (82.3), layout design (84.6%), and the ability to navigate throughout the sections (80.7%).

Two questions were asked to assess for threats to internal validity. Responses indicate that only 15 participants reported having attended any HIV-related education program that increased their HIV knowledge since completing the pretest. However, statistical tests comparing those who attended an HIV related program and those who did not, revealed no statistical significant difference on posttest knowledge or self-efficacy scores. Responses to the second question indicate that 8 of these individuals, as well as five additional participants, reported that there had been an event in their life since the pretest other than the educational program that increased their HIV knowledge. Similarly, statistical test comparing those who had an event in their life and those who had not, revealed no statistical significant difference on posttest knowledge or self-efficacy scores.

Eighty-nine percent of the participants reported being highly likely to take another HIV educational CD-ROM and approximately 91% would recommend this HIV educational CD-ROM to other healthcare professionals. The participants also reported that the educational program moderately changed their feelings for caring for people

living with HIV. Furthermore, 89.2% of the participants reported that information presented on the CD-ROM was culturally appropriate for their culture. They also reported they were highly satisfied that the content of the CD-ROM would help them care for people living with HIV in a more culturally sensitive manner.

The participants in this evaluation study reported taking an average of almost five and a half hours to complete the educational training program. The developers of the CAI CD-ROM estimated the time to complete program to be 5 to 6 hours. One participant reported reviewing the CD-ROM for 20 hours, 2 participants gave a high time frame of 40 hours to complete the educational CD-ROM program, with the remaining range being from 1 to 8 hours.

Eighty-seven percent of the participants reported that the teaching/learning resources were relatively appropriate and effective. Eighty-three percent reported the educational program had an impact on the way they approach their patients, and that the activity addressed their professional needs. Strikingly, a total of 90.8% ranked the educational activity to be worth their time and effort. Moreover, 93.9% concurred that the activity is free of commercial bias and 96.9% agreed that the objectives relate to the overall purpose or goal of the activity.

The results of this survey demonstrate participants' overall satisfaction with the CAI educational CD-ROM program. Furthermore, the satisfaction results with this CD-ROM as an educational tool are consistent with the satisfaction and value measures reported by Lemaire and Greene (2003). The CD-ROM group consistently provided

higher ratings than did those using three other electronic media methods of delivering continuing education.

General Limitations

The participants were selected from a convenience sample of healthcare professionals located in the United States. For the purpose of this study, healthcare professionals were limited to registered nurses; advanced practice nurses/nurse practitioners, physicians, and physician assistants. Therefore, participants are not representative of other healthcare professions, and results may not be generalizable to the other healthcare professionals served by the AETC.

This educational strategy was limited to healthcare professionals that have access to a computer and have at least minimal computer navigational skills. The study was limited to participants with access to a computer with adequate specifications and software for the CD-ROM to run. The sample of participants was also limited to healthcare professionals that read and comprehend the written English language, because the CD-ROM is available in English only.

Non-Completion

Emails and phone calls stating inability to access and run the CD-ROM on computers at work were sent by many healthcare professionals from one of the main recruitment locations. Despite being offered access to an appropriate computer at the local AETC, many of these individuals did not complete the program. In an effort to capture the reasons for non-completion, an email was sent to the 142 participants that did

not take the posttest. They were asked one question and provided 5 possible multiple choice answers. The majority of the 35 people that responded indicated that the time required to complete the CD-ROM program prevented them from completing the posttest. Other reasons were related to increasing work responsibilities and competing life events that prevented completion of the program. These barriers are consistent with recruitment problems and barriers encountered by other research studies in the literature (Atack & Rankin, 2002; Lemaire & Greene, 2003; Schmitt et al., 2004).

Technical problems

There was an unforeseeable problem that occurred when the http link malfunctioned. This malfunction inadvertently directed potential participants to another Elite Research Web site. This broken link issue was evaluated by three computer experts that mutually decided it was not preventable and was related to events that occur in the emailing transfer process. Therefore, the statement "If the link below is broken at the end: please copy and paste the first line of the link into your Web browser, then copy and paste the line below in your web browser" was placed before the link to provide instructions to the potential participants in the event the link broke.

The day after the issue with the broken link, a major computer crash occurred with the mainframe of the research company that managed the maintained the Web site and stored the data. Fortunately, there was no data lost because of computer backup mechanisms that were already in place. The problem was later identified to be related to the high number of people accessing the research study Web site host server at the same

time. Therefore, safeguards were put in place by Elite Research to prevent this problem from reoccurring.

Implications for Clinical Practice & Health Education

The debate continues regarding whose responsibility it is to guarantee healthcare professionals competence to provide healthcare services. Is it the state medical or nursing board's responsibility? Is it the employer's responsibility? Is it the employee's (healthcare professional) responsibility? Whatever the answers are to these questions, the fact that remains constant is that healthcare professionals will continue to have a need for continuing education to stay up to date with trends in healthcare and in their specific areas of specialty.

Yet, healthcare professionals continue to have personal and professional barriers in obtaining continuing education. The arena of effective educational strategies available to healthcare professionals is improving. It has expanded to include strategies of computer assisted instruction. The implications for all types of health professionals and health educators are significant, exciting, promising, and challenging.

The basics of educating healthcare professionals should remain constant as to the objectives to increase knowledge, improve patient care outcomes, and maximize the quality of life for patients. The CAI format opens more doors to deliver necessary information for healthcare professionals to stay up-to-date. The field of HIV/AIDS education is widening to work with technical experts to design and develop computer assisted educational programs that are balanced with information and technical devices.

This evaluation research study of a computer assisted instruction CD-ROM program as a strategy to educate health professionals provides an opportunity for planners of HIV education programs to improve future programs. This educational program has proven to be an effective method to increase knowledge and perceived self-efficacy of healthcare professionals to care for people living with HIV. It is important to build upon this CAI CD-ROM program, along with needs assessments of the intended audience, to develop educational programs in other specialties. Two different themes that have emerged from the results of this study are focused on HIV/AIDS education and CAI CD-ROM technology. Recommendations from the participants and suggestions for future investigations follow.

Participants' Recommendations for Improving the CAI CD-ROM

1. *"Should be able to open Web links in a new window with a click."*
2. *"Ability to minimize entire screen, for users to have the availability of multi-tasking".*
3. *"The ability to use with either a PC or a MAC computer."*
4. *"More issues that are affecting the African Americans, Hispanic/Latino, and female populations."*
5. *"HIV counseling certification" and "Initiation of ART doses and how they are determined."*
6. *"More interactive."*
7. *"Teens and HIV."*

8. *"The noises got annoying."*
9. *Graphics: "I think that more detailed graphics might help this CD. From the beginning to end I felt as though the CD graphics were rather primitive", and "Graphics on each page would have made it more visually appealing", and "Increase graphics would be nice".*
10. *"Printing: "Better ability to copy/paste & print some of the web site info", "better printing capabilities", and "Much of the format wasn't printer friendly".*

Recommendations for HIV/AIDS Education

1. This study should be compared with a traditional HIV continuing education program with identical content presented. For example, self-study print-based materials, or a 1-day workshop or seminar.
2. This study should be expanded to include measuring the participant's attitudes, behaviors, and practice changes as a result of the educational program.
3. Perform a follow-up study 6 to 12 months after completion of the educational program to identify system changes as a direct result of the program.
4. Utilizing the suggestions from the participants to create educational programs that are learner-centered, interactive, and based on the needs of the intended audience.

Recommendations related to Computer Assisted Instruction, CD-ROM

1. Investigate the possibility of making the entire educational program downloadable directly from the educational agency Web site.

2. Incorporate telephone-based consultative services with the CAI educational program, so the learner can obtain technical assistance for problems related to the CD-ROM.
3. Borrow some of the lessons learned from undergraduate and graduate distance education programs and utilize CAI as an adjunct to traditional educational strategies.

Education programs are vital for healthcare professionals to maintain competency in their individual areas of practice in order to provide quality healthcare. This is especially important in light of the rising numbers of HIV/AIDS in the United States and worldwide. This evaluation research study has shown computer assisted instruction to be an effective strategy to educate and train healthcare professionals about HIV/AIDS for the purpose of continuing education. The results of this research study confirm that the concept of self-efficacy, as a theoretical framework for increasing knowledge on HIV/AIDS, can improve a healthcare professional's perceived capability to care for people living with HIV/AIDS.

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APPENDIX A

Recruitment Flyer

Recruitment Emails

Free Continuing Education Units

*Approved for 6 hours credit in Nursing and 5 hours
AMA PRA by the University of Colorado School of
Medicine Accredited by ACCME*

HIV/AIDS PREVENTION, EARLY INTERVENTION & HEALTH PROMOTION:

A CONTINUING EDUCATION PROGRAM CD-ROM

WHO CAN PARTICIPATE?

Registered Nurses
Advanced Practice Nurses
Physicians
Physician Assistants

HOW CAN I SIGN UP?

Log on to www.????.com

QUESTIONS?

Contact Paula Reid at 214-590-4548

Beeper: 214-786-2129

Email: preid@parknet.pmh.org

APPROVAL FOR RECRUITMENT AD
<i>Ch. Hantel of 12/28/16</i>
Chairman, IRB
ICS Standards Comm

CD-ROM Developed by: Mountain Plains AIDS Education & Training Center
Evaluation Research Project: Paula Reid, RNC, WHCNP, PHD(c), Nurse Practitioner
HIV Services Department at Parkland Health & Hospital System, and Adjunct
Faculty for Texas/Oklahoma AIDS Education & Training Center

Mail Message

Novell

Close Next Forward Reply to Sender Reply All Move Delete Read Later Properties

From: PAULA REID
To: PAULA REID
Date: Thursday - December 16, 2004 9:11 PM
Subject: Parkland Postmaster Email Announcement

Free Continuing Education Units

Approved for 6 hours credit in Nursing and 5 hours AMA PRA by the University of Colorado School of Medicine Accredited by ACCME

HIV/AIDS PREVENTION, EARLY INTERVENTION & HEALTH PROMOTION: A CONTINUING EDUCATION PROGRAM CD-ROM

WHO CAN PARTICIPATE?

Registered Nurses
Advanced Practice Nurses
Physicians
Physician Assistants

HOW CAN I SIGN UP?

Log on to www.pph.com

QUESTIONS?

Contact Paula Reid at 214-590-4548
Beeper: 214-786-2129
Email: preid@parknet.pmh.org

CD-ROM developed by: Mountain Plains AIDS Education & Training Center
Evaluation Research Project: Paula Reid, RNC, PhD(c) Nurse Practitioner, HIV Services Department at Parkland Health & Hospital System
Adjunct Faculty for Texas/Oklahoma AIDS Education & Training Center

Attention Potential Parkland Participants: The CD-ROM will only run on the Parkland "Custom Computers."
Contact Paula Reid for an available "Custom Computer" near you.

Mail Message

icvell.

[Close](#) [Previous](#) [Next](#) [Forward](#) [Reply to Sender](#) [Reply All](#) [Move](#) [Delete](#) [Read Later](#) [Properties](#)

From: PAULA REID
To: PAULA REID
Date: Thursday - December 16, 2004 9:18 PM
Subject: Email & Listserve Recruitment Announcement

Free Continuing Education Units

Approved for 6 hours credit in Nursing and 5 hours AMA PRA by the University of Colorado School of Medicine Accredited by ACCME

HIV/AIDS PREVENTION, EARLY INTERVENTION & HEALTH PROMOTION: A CONTINUING EDUCATION PROGRAM CD-ROM

WHO CAN PARTICIPATE?

Registered Nurses
Advanced Practice Nurses
Physicians
Physician Assistants

HOW CAN I SIGN UP?

Log on to www.pmh.org

QUESTIONS?

Contact Paula Reid at 214-590-4548
Beeper: 214-786-2129
Email: preid@parknet.pmh.org

CD-ROM developed by: Mountain Plains AIDS Education & Training Center
Evaluation Research Project: Paula Reid, RNC, PhD(c)Nurse Practitioner, HIV Services Department at Parkland Health & Hospital System
Adjunct Faculty for Texas/Oklahoma AIDS Education & Training Center

APPENDIX B

Research Study Instructions

Purpose: The primary purpose of this evaluation research project is to evaluate the effectiveness of the “HIV/AIDS Prevention, Early Intervention, and Health Promotion” educational CD ROM product. The secondary purpose will be to evaluate effectiveness of Computer Assisted Instruction (CAI) as a HIV/AIDS training strategy to educate health care professionals seeking continuing education.

Privacy/Confidentiality Statement: The information that you provide will be handled with total privacy and confidentiality. The researcher will not access any information that identifies the participant by name. A “research study ID code” will be assigned to each participant and placed on your CD-ROM holder that will be mailed after completion of the pretest. This is a process that will be conducted by a faculty member from a non-affiliated university. In addition, a clerical research assistant will process all continuing education materials & forms required for obtaining a continuing education certificate.

Continuing Educational Credit: The University Of Colorado School Of Medicine in collaboration with the Mountain Plains AIDS Education & Training Center (MPAETC) approves this educational program for 6 hours Nursing credit and 5 hours AMA PRA accredited by the Accreditation Council for Continuing Medical Education (ACCME).

Procedure: This evaluation research project will consist of a pre-test and post-test to assess knowledge gained and satisfaction with this educational method. The steps are as follows:

1. Complete the pretest survey online, which consist of:
 - “HRSA AIDS Education and Training Centers Participant Information Form”, United States Federal Government OMB Form.
 - Self-Appraisal
 - Case Study pretest
2. The self-study educational CD-ROM on “HIV/AIDS Prevention, Early Intervention, and Health Promotion” will be mailed to the contact information provided at the end of the pre-test case study.
3. Study and review the educational CD-ROM
4. Return to the research study Web site and complete the post-test online which consist of:
 - Case Study post-test
 - Self-Appraisal (post educational program CD-ROM)
 - Final Evaluation Survey
5. Continuing education certificate that has been approved for 6 hours Nursing credit and 5 hours AMA PRA by the University of Colorado School of Medicine

accredited by the Accreditation Council for Continuing Medical Education (ACCME), will be mailed to you at the contact information provided in step 2. All parts of the project must be completed and score 75% on the post-test case study in order to obtain continuing education certificate.

Your participation is voluntary and greatly appreciated. You may remove yourself from this evaluation research project at any time. **The submission of your completed questionnaire with contact information constitutes your informed consent to act as a participant in this research.**

Thank you in advance for your participation in this research project.
Paula V. Reid, RNC, WHNP, PhD(c)

Questions: Call Paula at 214-590-4548 (office) or 214-786-2129 (Beeper)
Email: preid@parknet.pmh.org

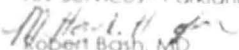
APPENDIX C

IRB Approval Forms

CONTENTS

Institutional Review Board

TO: Paula V. Reid, RNC, WHCNP, PhD(c)
HIV Services - Parkland

FROM: 
Robert Bash, MD
Institutional Review Board 2 Chairman
IRB - 8843

DATE: January 24, 2005

RE: **Exempt From IRB Review**
IRB Number: 012005-027
Title: The Effectiveness of Computer-Assisted Instruction as a Strategy for HIV/AIDS Education & Training for Health Care Professionals

The Institutional Review Board considers that this research is exempt in accordance with the Code of Federal Regulations, Title 45, Part 46, Sub-part 101(b)(1) as revised November 13, 2001. Further review of this study by the IRB is not required unless the protocol changes in the use of human subjects. In that case, the study must be resubmitted immediately to the Board. Please inform the IRB when this research is completed.

If you have any questions related to this research or the IRB, you may telephone Jan Harrell, at 214.648.9453.

RB/iw

BEST



Institutional Review Board
Office of Research and Sponsored Programs
P.O. Box 425619, Denton, TX 76204-5619
940-898-3378 Fax 940-898-3416
e-mail IRB@twu.edu

February 1, 2005

Ms. Paula Reid

Dear Ms. Reid:

Re: *The Effectiveness of Computer-Assisted Instruction as a Strategy for HIV/AIDS Education and Training for Health Care Professionals*

The above referenced study has been reviewed by the TWU Institutional Review Board (IRB) and has been determined to be exempt from further review because it has been reviewed and approved by an IRB at The University of Texas Southwestern Medical Center at Dallas.

Another review by the TWU IRB is required if your project changes in any way, and the TWU IRB must be notified immediately regarding any adverse events. If you have any questions, feel free to call the TWU Institutional Review Board at the phone number listed above.

Sincerely,

Dr. David Nichols, Chair
Institutional Review Board - Denton

- cc. Dr. Susan Ward, Department of Health Studies
Dr. Jody Oomen, Department of Health Studies
Graduate School

Simply the **BEST**

APPENDIX D

IRB Approval Letter for Appreciation Drawing

Memo

Date: 5/2/05
To: TWU Denton Campus, IRB
Cc: William Cissell PhD, Dissertation Committee Chair for Paula Reid
From: Paula V. Reid RNC, WHCNP, MSN
RE: Addition to Research Study

This memo is to follow through on a conversation with Dr. Nichols today regarding an addition to my dissertation research study. This research study was given IRB exempt approval on February 8, 2005.

Study Title: The Effectiveness of Computer Assisted Instruction as a Strategy for HIV/AIDS Education & Training for Health Care Professionals

Study Addition: After discussion with Dr. Jody Oomen (committee member), it was suggested to place the enrolled participants into a raffle drawing when the post- test is completed by the current study ending date of July 1, 2005. There will be two raffle drawings. The prize for the first one will be a \$100.00 gift certificate for amazon.com. The prize for the second raffle drawing will be a \$100.00 gift card for Target. This addition will be included in a reminder emails that are scheduled to be sent out in May and June 2005.

My current dissertation committee chair, Dr. William Cissell was informed of this addition and is in agreement. Dr.Cissell directed me to contact Dr.Nichols with IRB, that instructed me to write-up what will be done in the form of a memo to IRB.

Thanks You,

Paula V. Reid, RNC, WHCNP, PhD (c)

APPROVES
5/3/2005
Doreen J. Nichols

5/2/05

Confidential

1

APPENDIX E

Appreciation Drawing E-mail

Title: "Appreciation Drawing" for CD-ROM: CAI & HIV Evaluation Research

Evaluation Research Participant:

Hurry to the "post test finish line!" We are anxiously awaiting your arrival. To show our appreciation, all participants that **complete the post test by July 1, 2005 (deadline)** will be entered in **2 raffle drawings**.

Drawing #1 Prize: Amazon.com gift certificate valued at \$100.00

Drawing #2 Prize: Target gift card valued at \$100.00

When you are ready to complete the post test, please click on the link below or copy & paste into your web browser window the following link;

<http://www.elite-research.com/dev/TakeSurvey.asp?SurveyID=l0H5n3M34n5M1>

Second Option: Send an email requesting the post test to CAI@eliteresearch.com. The web site link for the post test will be sent via email- reply.

You are almost done!! Please, don't stop now and miss out on those 6 valuable continuing education credits or 5 CME's!

Study Tip:

Schedule: 1.5 hours per week ---- 4 weeks remaining

Average: 15 minutes per day, with a free day each week

You can do it!

Thank You, Paula Reid RNC, WHCNP, PhD(c)
CAI Research Evaluation Project, Principal Investigator

APPENDIX F

Winners of Appreciation Drawing E-mail

Appreciation Drawing #1 Winner E-mail

Title: Congratulations CAI "Appreciation Drawing" Winner

Congratulations, I am pleased to inform you that you are the winner of the Appreciation Drawing conducted with a random numbers table. As the winner of the first drawing you have won a \$100 gift certificate for Amazon.com. To receive more details and discuss how you can collect your prize, contact me via email reply or phone at 214-590-4548.

Thank you very much for volunteering to be a participant in this evaluation research project to improve future HIV educational programs. Your time and participation is greatly appreciated.

Paula Reid, RNC, WHCNP, PhDc
Principal Investigator

Appreciation Drawing #2 Winner E-mail

Title: Congratulations CAI "Appreciation Drawing" Winner

Congratulations, I am pleased to inform you that you are the winner of the Appreciation Drawing conducted with a random numbers table. As the winner of the second drawing you have won a gift card for Target department stores in the amount of \$100. To receive more details and discuss how you can collect your prize, contact me via email reply or phone at 214-590-4548.

Thank you very much for volunteering to be a participant in this evaluation research project to improve future HIV educational programs. Your time and participation is greatly appreciated.

Paula Reid, RNC, WHCNP, PhDc
Principal Investigator

Appreciation Drawing Winner Announcement E-mail

Final CAI Program Evaluation E-mail
Announcement of "Appreciation Drawing" Winner's

I just wanted to send a personal note to say thank you for completing the Computer Assisted Instruction (CAI) Evaluation Research Project for the "HIV/AIDS Prevention, Early Intervention & Health Promotion", an educational CD-ROM program.

Also, I am pleased to announce the "Appreciation Drawing" has been completed. This was performed by a random number table selection process. The winners have been notified electronically, one from the state of Texas, and another from the state from North Carolina.

Thank you very much for participating in this project, it is greatly appreciated.

Paula Reid, RNC, WHCNP, PhDc
Principal Investigator

APPENDIX H

Professional Organization Newsletter Announcements

Member Reports

From the Dean-

One of the many ways that the School and Chapter are working together is related to scholarship support of BSN students. Delta Theta Tau Chapter provided a \$10,000 endowment in 2003 that result in a \$500 scholarship to a BSN student annually in perpetuity. The March 7th 2005 Dream Makers Luncheon provided the opportunity for Deborah Green to sit with the Delta Theta Tau Chapter Scholarship recipients, Rochelle Vaughn, and Elizabeth Knight, and learn more about their background, achievements and goals. The students will feel an especially close connection and I expect will want to be members of STT. They will also personally see the benefits of scholarship support and therefore more readily want to give back to other students through mentoring and as well as donations for UTA student scholarships. This is a wonderful way for the chapter to create important life long linkages with our BSN students who are the chapter's future members.

On the agenda for the near future is another collaborative initiative, the naming of a room in the School that will officially serve as Delta Theta Chapter's home site. We are well on the way with planning efforts and look forward to the dedication of the room.

Elizabeth C. Poster, PhD, RN, FAAN

FREE CEU's: Evaluation Research Project!

Approved for 6 hours credit in Nursing and 5 hours AMA PRA by the University of Colorado School of Medicine Accredited by ACCME

"HIV/AIDS PREVENTION, EARLY INTERVENTION & HEALTH PROMOTION:

A CONTINUING EDUCATION PROGRAM CD-ROM"

Log on to the following website:

<http://elite-research.easycgi.com/dev/TakeSurvey.asp?SurveyID=341lm3L29m33G>

Please pass the word to other healthcare professionals!

Questions: Contact Paula Reid at 214-590-4548 (Parkland Hospital) Email: preid@parknet.pmh.org

Nominees for the following positions will be accepted until April 15, 2005:

Treasurer

Vice-President

Chair of Leadership and Succession Committee & 3

elected members

Members of Governance Committee 3 elected

members

For more information,
please contact:
barr@uta.edu



ANAC METRO NEWS

ANAC-METRO ATLANTA CHAPTER

1000 Peachtree St., Atlanta, Georgia 30308-0995
 Phone: 404.525.5555 Fax: 404.525.5556

Message from ANAC President Barbara Blake, RN, PhD, ACRN

Happy 2005! It may be two months late, but I believe it is better late than never! It is hard for me to believe that I have had the privilege of being the president of YOUR chapter for over two months.


For those of you who do not know me, I have only been a member of our chapter for slightly more than two years. What I remember most about my first educational meeting is not the speaker or the restaurant, but the warm welcome I received from everyone in attendance and the dedication to the chapter and the HIV community that I sensed. Now that I am chapter president, I would like to take this opportunity to share with you my personal philosophy and vision for the chapter's future.

Notice that I began this message by talking about being the president of YOUR chapter. This is important to me because I believe that our ANAC chapter will only be as good as what we, the members, are willing to do not only for the chapter, but for the community. As the year progresses, I challenge each member to take time to consider volunteering for one of our community service activities or volunteering to help make a difference in our chapter. Working for the chapter does not require that you hold an office, because there is always a need for help with special activities or initiatives. If you are not sure what opportunities are available-just ask a member of the Executive Committee- there is always something to do. If this is not a good year, then make the commitment for next year. It is also important that we continue to grow

our membership. Without new members and new ideas, we will not flourish as a chapter. Remember that you can also contribute to our chapter by inviting other individuals who are dedicated to the delivery of healthcare to persons infected or affected by HIV to become members. As the president, I want each member to know that the Executive Committee works for you. However, if members do not voice their recommendations or concerns, it is left to the Executive Committee to determine what is best for the chapter. Therefore, if you have an opinion or a proposal that you believe will benefit the chapter, plan to attend one of the bimonthly Executive Committee meetings or you can email or call one of the committee members. The Executive Committee is always looking for fresh ideas!

At our next meeting, I urge every one to network not only with those individuals you already know, but to introduce yourself to someone you have not seen at one of our previous meetings. Our meetings are a great opportunity for building bridges within the HIV community. Please take advantage of them.

Over the next year, I hope I have the opportunity to meet each and every one of you at our educational meetings, as this is my personal goal. Let me end by saying that this is a great organization, an exceptional chapter, and I believe "the best is yet to come!"

Thanks again for the opportunity to serve as your president. 



FREE CONTINUING EDUCATION UNITS

Approved for 6 hours credit in Nursing and 5 hours AMA PRA by the University of Colorado School of Medicine Accredited by ACCEME

HIV/AIDS PREVENTION, EARLY INTERVENTION & HEALTH PROMOTION: A CONTINUING EDUCATION PROGRAM CD-ROM

WHO CAN PARTICIPATE?

Registered Nurses
Advance Practice Nurses
Physicians
Physician Assistants

HOW CAN I SIGN UP?

Log onto the following website or copy & paste the address below into your browser:

<http://elite-research.easycgi.com/dey/TakeSurvey.asp?SurveyID=341lm3L29m33G>

If you know of anyone that would be interested and/or eligible to participate in this project, please forward this email to them.

QUESTIONS?

Contact Paula Reid at 214-590-4548
Beeper: 214-786-2129
Email: pried@parksnet.pmh.org

CD-ROM Developed by: Mountain Plains AIDS Education & Training Center

Evaluation Research Project: Paula Reid, RNC, WHCNP, PHD©, Nurse Practitioner
HIV Services Department of Parkland Health & Hospital System, and Adjunct Faculty for
Texas/Oklahoma AIDS Education & Training Center

Great New ANAC Member Benefit: JANAC Online

ANAC and Elsevier publishers are pleased to announce that the *Journal of the Association of Nurses in AIDS Care (JANAC)* was launched with a new online version in January 2005. Please visit www.janacnet.org to see this exciting member benefit first-hand.

The user-friendly format of JANAC Online allows you to view the full text of the print journal. You can search across issues, abstracts, citations, authors, or text. You can also save your searches and have new search results delivered automatically via e-mail alerts. You can elect to receive the table of contents by email each month—featuring links to the articles in the latest issue—well in advance of receiving your print issue. JANAC Online is a

valuable resource tool and the perfect companion to your print issues.

After June 1, 2005, access to JANAC Online will be reserved exclusively for ANAC members and JANAC subscribers. To continue to access the journal online, you will need to register. Please go to www.janacnet.org and follow the registration steps today. If you have any questions or problems, you can contact Elsevier's Customer Service by calling (800) 654-2452 (Toll Free US & Canada) or (407) 345-4299 (Outside US & Canada).

Experience the full potential of your subscription to JANAC, and take part in this ANAC member benefit. Activate your online access now at www.janacnet.org.

Call or email the ANAC national office for your copy of the third edition of the Distinguished Lecturers Directory. This directory features our members as nurse experts on issues related to HIV/AIDS. You may have immediate access by going to http://www.anacnet.org/programs/pubs/lecturers_list.php. Consider inviting a Distinguished Lecturer for your next chapter, community or institution event. Take advantage of their knowledge and expertise as you plan your programs.

What is I-TECH?

The Nursing Workforce Development Initiative is a component of The International Training & Education Center on HIV (I-TECH). The goal of the Nursing Initiative is to develop strategies to assist resource-poor countries build capacity for the effective deployment of nurses in AIDS care that increase competency in their roles as educators, advocates, and caretakers. Building on the foundation of I-TECH and the framework of the Nursing Workforce Development Initiative, the principle objective is to work directly with nurses in resource-poor settings to assist in initiating country specific capacity development activities. These activities will focus on three essential components: pre-service nursing preparation, mentorship and nursing workforce issues. The I-TECH Nursing Workforce Development Initiative activities are presently underway in Malawi and Ethiopia. For more information visit the I-TECH website: www.go2itech.com or contact MaryAnn Vitiello at mav4@u.washington.edu or Carmen Portillo at carmen.portillo@nursing.ucsf.edu.

Free CEU's! - CD-ROM Evaluation

Free Continuing Education Units! Approved for 6 hours credit in Nursing and 5 hours AMA PRA by the University of Colorado School of Medicine Accredited by ACCME

HIV/AIDS PREVENTION, EARLY INTERVENTION & HEALTH PROMOTION: A CONTINUING EDUCATION PROGRAM CD-ROM

WHO CAN PARTICIPATE? Registered Nurses, Advanced Practice Nurses, Physicians, Physician Assistants

HOW CAN I SIGN UP? Log on to the following web site: <http://elite-research.easycgi.com/dev/>

[TakeSurvey.asp?SurveyID=3411m3L29m33G](http://elite-research.easycgi.com/dev/TakeSurvey.asp?SurveyID=3411m3L29m33G)

ANAC MEMBERS: PLEASE HELP RECRUIT!! We invite you to participate in this free CEU offering and help us recruit. Please help get the word out about this educational opportunity to your peers, friends, colleagues, and physicians that are eligible. If you know of anyone that would be interested and/or eligible to participate in this project, please share this information and the web site.

QUESTIONS?

Contact Paula Reid at 214-590-4548, beeper: 214-786-2129 or email: preid@parknet.pmh.org. CD-ROM Developed by: Mountain Plains AIDS Education & Training Center Evaluation Research Project: Paula Reid, RNC, WHCNP, PHD(c), Nurse Practitioner HIV Services Department at Parkland Health & Hospital System, and Adjunct Faculty for Texas/Oklahoma AIDS Education & Training Center

EXECUTIVE DIRECTOR REPORT

ADELE WEBB



It is so exciting to hear about all of the chapters that are hosting education days and spring meetings. Since the chapter meetings held last year, there has certainly been an upturn of activity in each of the chapters. In addition, funded chapter meetings on new medications and co-infection have brought some chapters together as they hosted joint meetings around these special topics.

The midyear conference is fast approaching and the agenda is quite stimulating. This meeting presents an excellent opportunity for our researchers to hear what their colleagues are doing as well as share their own research projects. Watch the website for information about next year's midyear conference.

As always, we are looking ahead to November. Sitting in Ohio right now in the winter weather makes Orlando look extremely attractive as a venue. For those of you who have never been to the Swan Hotel, it offers state of the art meeting space, comfortable rooms and ample entertainment. The Call for Abstracts has been distributed. The Exhibitor Prospectus is available. Look for the Preliminary Program July 1st.

The Nominations process is underway. Watch your mail for your ballot and make your vote count. Also - consider nominating yourself or a colleague for an ANAC award. Information will be out in the next month regarding available awards and the associated criteria.

APPENDIX I

HRSA AIDS Education and Training Centers Participant Information Form

APPENDIX J

Self-Appraisal Survey (Self-Efficacy)

Self-Appraisal Survey (Self-efficacy)
(This was given in the pretest and posttest.)

1. How well can you "discuss the dynamics of HIV infection?"

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

2. How well can you "discuss the implications for clinical care related to HIV transmission?"

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

3. How well can you "identify the different stages of HIV disease?"

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

4. How well can you "describe the implications for clinical care related to HIV prevention?"

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

5. How well can you "define the responsibilities of the health care provider in HIV case findings?"

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

6. How well can you "list essential components of HIV pre and post test counseling?"

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

7. How well can you “recognize the components of conducting an HIV risk assessment?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

8. How well can you “identify when HIV testing should be recommended?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

9. How well can you “conduct a comprehensive initial visit with an HIV-infected client?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

10. How well can you “identify essential laboratory tests needed in an initial patient visit?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

11. How well can you “discuss considerations for the initiation of antiretroviral therapy?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

12. How well can you “describe the importance of adherence to antiretroviral therapy?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

13. How well can you “identify important health maintenance issues?”

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

14. How well are your computer navigational skills?

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

15. How well can you use a CD-ROM to obtain continuing education?

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

16. Overall, how confident are you to provide healthcare services to people living with HIV?

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

17. Overall, what is your competence level to provide healthcare services to people living with HIV?

1	2	3	4	5	6	7
Not well At all		Not too well		Pretty well		Very well

APPENDIX K

Pretest Section 3 Case Study

Pretest Section 3
Case Study

Note: This was adapted from the posttest developed by MPAETC – to be parallel. This patient name was changed to Donna from Lacey and answers placed in a different order according to test writing principles.

Please read the following case and circle the one best response to each question that follows.

Donna, a 45-year-old author, is a new patient for you. On her first visit she told you she had been successful enough to allow her to set up a studio in a rural area not far from your clinic. She told you she lives alone at the studio and enjoys the solitude. She also mentions that she enjoys working in a quiet place, but, intended to travel “a lot” to do research and to go to book signings. Donna presents today with a painful lesion on her vulva that erupted two days ago. Examination reveals vesicles typical of herpes simplex type II. You give Donna a prescription for acyclovir.

1. Donna’s chart reveals she did not have a thorough risk assessment on her first clinic visit. How would a risk assessment be best approached?
 - a. Ask Donna why she isn’t concerned about sexually transmitted diseases
 - b. Based on Donna’s age and current living situation, a risk assessment is not needed
 - c. Start with and focus on questions related to sexual activities
 - d. Tell Donna that she has to give you some personal information
 - e. Tell Donna that you need to ask some questions to help determine areas of risk

2. Donna denies any injection drug use. You should:
 - a. encourage her to continue to abstain from drug use
 - b. give her literature on treatment for drug use
 - c. reinforce the risks of injection drug use
 - d. show her how to clean injection equipment

3. Which of the following should prompt HIV counseling and testing?
- Any STD diagnosis
 - History of a single act of unprotected sexual intercourse
 - Kaposi sarcoma
 - Pregnancy
 - a & d
 - All of the above
4. You encourage Donna to be tested for HIV infection as well as other STDs. Before she consents to the test, you should do all of the following, except:
- discuss the limitations of the test
 - provide risk reduction counseling based on her risk profile
 - provide information about the personal consequences of having the HIV test
 - tell her you will call her with the results within the next two weeks
5. Donna returns to the clinic in a week to learn her HIV test results, which were positive for HIV. Post-test procedures should include:
- Assessment for emotional distress
 - Instructions to abstain from all sexual and needle sharing activities
 - Offer to contact her family to give them the news
 - Request for her to give you permission to disclose her HIV status to other health care providers
6. Donna's blood work reveals a CD4+T cell count of 222 cells/mm³ and a viral load of 42,000 copies/ml. According to current treatment guidelines, what should you suggest?
- Consider offering combination antiretroviral therapy after consultation with an HIV specialist
 - Defer treatment and monitor her status
 - Discuss the need for Donna to move closer to specialty services
 - Offer prophylaxis for PCP and discuss the use of zidovudine as an initial treatment

7. Donna's care over the next several months should include all of the following, except:
- Age appropriate health maintenance
 - Career counseling to change to a job with less traveling
 - HIV-specific education and social support
 - Referral to HIV care specialists as needed
 - Routine laboratory assessment of viral loads and CD4+T cell counts
8. Which would be the most important initial labs to assess on Donna?
- CBC, viral load, CD4+ T cell count, LFTs
 - CBC, fasting glucose, LFTs, CD4+ T cell count
 - CD4+ T cell counts, viral load, triglycerides, TSH
 - Hepatitis panel, viral load, Pap smear, serum cholesterol
9. Which of the following immunizations should Donna have?
- Hepatitis B vaccine
 - Measles, Mumps, and Rubella vaccine
 - Pneumococcal vaccine
 - Varicella vaccine
 - b & c
 - all of the above
10. According to the CDC, Donna would receive a diagnosis of AIDS if:
- Donna already qualifies for a diagnosis of AIDS based on her lab work
 - Her CD4+T cell count goes below 200 cells/mm³
 - She develops peripheral neuropathy or lactic acidosis
 - She develops persistent nausea, vomiting, and diarrhea
11. The goals of antiretroviral therapy for Donna would include all of the following, except:
- Elimination of HIV from Donna's body
 - Enhanced quality and quantity of life
 - Suppression of viral load to undetectable levels
 - Maintenance of immune function and prevention of OIs

12. If Donna decides to start taking ART, what factor would have the most negative influence on her ability to adhere to the treatment regimen?
- a. Active alcohol use
 - b. Frequent contact with her care provider
 - c. Therapy that minimizes the number of daily doses day
 - d. Selection of a regimen that fits into her work and travel schedule

APPENDIX L

Reminder and Extension E-mails

Reminder E-mail #1

Title: CEU/CME – CAI & HIV Research Evaluation

Evaluation Research Participant:

We would like to thank you for the valuable time you have spent thus far with this project. You have already made it half-way and we are anxiously waiting for you at the “post test finish line.” When you are ready to complete the post test, please send an email to CAI@elite-research.com, requesting the posttest. The web site link for the post test will be sent via email- reply.

You are almost done!! Please, don't stop now and miss out on those valuable continuing education credits!

Thank You, Paula Reid RNC, WHCNP, PhD(c)
CAI Research Evaluation Project, Principal Investigator

Final Reminder E-mail

Title: Don't forget -- CD-ROM for CAI & HIV Evaluation Research Program

Evaluation Research Participant:

Don't forget that the final **post test date** for the "HIV/AIDS Prevention, Early Intervention and Health Promotion CD-ROM" is August 8th, 2005. You still have time to complete the project and earn those valuable CEU/CME credits, even if you haven't had the time to start reviewing the CD-ROM.

Reminders:

1) To show our appreciation, all participants that **complete the post test by August 8, 2005 (extended completion date)** will be entered in **2 raffle drawings**.

Drawing #1 Prize: Amazon.com gift certificate valued at \$100.00

Drawing #2 Prize: Target gift card valued at \$100.00

2) When you are ready to complete the post test, please click on the link below or copy & paste into your web browser window the following link;

<http://www.elite-research.com/dev/TakeSurvey.asp?SurveyID=l0H5n3M34n5M1>

Second Option: Send an email requesting the post test to CAI@eliteresearch.com. The web site link for the post test will be sent via email- reply.

You can do it!

Thank You, Paula Reid RNC, WHCNP, PhD(c)
CAI Research Evaluation Project, Principal Investigator

Title: Extension -- CD-ROM for CAI & HIV Evaluation Research Program

Evaluation Research Participant:

We have decided to “**extend**” the final **post test date** for the “HIV/AIDS Prevention, Early Intervention and Health Promotion CD-ROM.” You still have time to complete the project and earn those valuable CEU/CME credits, even if you haven’t had the time to start reviewing the CD-ROM.

Study Tip & Timeline:

Theme: “5 Hours in 5 Weeks”

Time Frame: 5 weeks remaining to August 8, 2005 deadline

CD-ROM Review Time: Approximately 5 - 6 hours

Plan: Average “just” 1 hour per week

Reminders:

1) To show our appreciation, all participants that **complete the post test by August 8, 2005 (extended completion date)** will be entered in **2 raffle drawings**.

Drawing #1 Prize: Amazon.com gift certificate valued at \$100.00

Drawing #2 Prize: Target gift card valued at \$100.00

2) When you are ready to complete the post test, please click on the link below or copy & paste into your web browser window the following link;

<http://www.elite-research.com/dev/TakeSurvey.asp?SurveyID=l0H5n3M34n5M1>

Second Option: Send an email requesting the post test to CAI@eliteresearch.com. The web site link for the post test will be sent via email- reply.

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Thank You, Paula Reid RNC, WHCNP, PhD(c)
CAI Research Evaluation Project, Principal Investigator

Reminder E-mail #2

Title: "Half-Way through the final stretch" for CD-ROM: CAI & HIV Evaluation Research

Evaluation Research Participant:

We are down to 15 days before the last day to complete the evaluation project and earn those valuable CEU/CME credits.

Reminders:

To show our appreciation, all participants that **complete the post test by July 1, 2005 (deadline)** will be entered in **2 raffle drawings**.

Drawing #1 Prize: Amazon.com gift certificate valued at \$100.00

Drawing #2 Prize: Target gift card valued at \$100.00

When you are ready to complete the post test, please click on the link below or copy & paste into your web browser window the following link;

<http://www.elite-research.com/dev/TakeSurvey.asp?SurveyID=l0H5n3M34n5M1>

Second Option: Send an email requesting the post test to CAI@eliteresearch.com. The web site link for the post test will be sent via email- reply.

You are almost done!! Please, don't stop now and miss out on those 6 valuable continuing education credits or 5 CME's!

You can do it!

Thank You, Paula Reid RNC, WHCNP, PhD(c)
CAI Research Evaluation Project, Principal Investigator

APPENDIX M

Posttest Part 1 Case Study

Please read the following case and circle the one best response to each question that follows.

Case. Lacey, a 45-year-old author, is a new patient for you. On her first visit she told you she had been successful enough to allow her to set up a studio in a rural area not far from your clinic. She told you she lives alone at the studio and enjoys the solitude. She said she liked to work in a quiet place but that she intended to travel “a lot” to do research and to go to book signings. Lacey presents today with a painful lesion on her vulva that erupted two days ago. Examination reveals vesicles typical of herpes simplex type II. You give Lacey a prescription for acyclovir.

1. Lacey’s chart reveals she did not have a thorough risk assessment on her first clinic visit. How would a risk assessment be best approached?
 - a. Start with and focus on questions related to sexual activities
 - b. Tell Lacey that she has to give you some personal information
 - c. Ask Lacey why she isn’t concerned about sexually transmitted diseases
 - d. Tell Lacey that you need to ask some questions to help determine areas of risk
 - e. Decide that, given Lacey’s age and current living situation, a risk assessment is not needed
2. Lacey denies any injection drug use. You should:
 - a. reinforce the risks of injection drug use
 - b. show her how to clean injection equipment
 - c. give her literature on treatment for drug use
 - d. encourage her to continue to abstain from drug use
3. Which of the following should prompt HIV counseling and testing?
 - a. Pregnancy
 - b. Kaposi sarcoma
 - c. Any STD diagnosis
 - d. A history of a single act of unprotected sexual intercourse
 - e. b & c
 - f. All of the above

4. You encourage Lacey to be tested for HIV infection as well as other STDs. Before she consents to the test, you should do all of the following, except:
- discuss the limitations of the test
 - provide risk reduction counseling based on her risk profile
 - tell her you will call her with the results within the next two weeks
 - provide information about the personal consequences of having the HIV test
5. Lacey returns to the clinic in a week to learn her HIV test results, which were positive for HIV. Post-test procedures should include:
- An assessment for emotional distress
 - An offer to contact her family to give them the news
 - Instructions to abstain from all sexual and needle sharing activities
 - A request for her to give you permission to disclose her HIV status to other health care providers
6. Lacey's blood work reveals a CD4+T cell count of 222 cells/mm³ and a viral load of 42,000 copies/ml. According to current treatment guidelines, what should you suggest?
- Defer treatment and monitor her status
 - Discuss the need for Lacey to move closer to specialty services
 - Offer prophylaxis for PCP and discuss the use of zidovudine as an initial treatment
 - Consider offering combination antiretroviral therapy after consultation with an HIV specialist
7. Lacey's care over the next several months should include all of the following, except:
- Age appropriate health maintenance
 - Referral to HIV care specialists as needed
 - HIV-specific education and social support
 - Career counseling to change to a job with less traveling
 - Routine laboratory assessment of viral loads and CD4+T cell counts
8. Which would be the most important initial labs to assess on Lacey?
- CBC, viral load, CD4+ T cell count, LFTs
 - CBC, fasting glucose, LFTs, CD4+ T cell count
 - CD4+ T cell counts, viral load, triglycerides, TSH
 - Hepatitis panel, viral load, Pap smear, serum cholesterol

9. Which of the following immunizations should Lacey have?
- Varicella vaccine
 - Hepatitis B vaccine
 - Pneumococcal vaccine
 - Measles, Mumps, and Rubella vaccine
 - b & c
 - all of the above
10. According to the CDC, Lacey would receive a diagnosis of AIDS if:
- Her CD4+T cell count goes below 200 cells/mm³
 - She develops peripheral neuropathy or lactic acidosis
 - She develops persistent nausea, vomiting, and diarrhea
 - Lacey already qualifies for a diagnosis of AIDS based on her lab work
11. The goals of antiretroviral therapy for Lacey include all of the following, except:
- Enhanced quality and quantity of life
 - Elimination of HIV from Lacey's body
 - Suppression of viral load to undetectable levels
 - Maintenance of immune function and prevention of OIs
12. If Lacey decides to start taking ART, what factor would have the most negative influence on her ability to adhere to the treatment regimen?
- Active alcohol use
 - Frequent contact with her care provider
 - Therapy that minimizes the number of daily doses day
 - Selection of a regimen that fits into her work and travel schedule

APPENDIX N

Satisfaction Survey

Please answer the following questions in regard to the educational program CD-ROM (Computer Assisted Instruction strategy) entitled, "HIV/AIDS Prevention, Early Intervention, and Health Promotion" --- a continuing education program.

1. How satisfied were you with the effectiveness of the graphics.

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

2. How satisfied were you with the readability of the font size?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

3. How satisfied were you with the visual appearance of the content information for the educational program (CD-ROM)?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

4. How satisfied were you with the sound quality of the educational program (CD-ROM)?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

5. How satisfied were you with the layout design of the educational program (CD-ROM)?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

6. How satisfied were you with the ability to navigate through the sections of the CD-ROM without problems?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

If not, tell us what problems you encountered.

Discussion question

7. Overall, how likely is it that you will take another HIV educational program CD-ROM that requires the assistance of a computer?

Not likely at all 1 2 3 4 5 6 7 Highly likely

8. Overall, how likely is it that you will recommend this HIV educational program CD-ROM to other healthcare professionals?

Not likely at all 1 2 3 4 5 6 7 Highly likely

9. Overall, how satisfied were you with this HIV educational program CD-ROM?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

10. Has this educational program changed your feelings about caring for people living with HIV?

Not changed at all 1 2 3 4 5 6 7 Highly changed

If so, how has it changed?

Discussion question

11. How satisfied are you with the cultural appropriateness, for *your* culture, of the information presented on the CD-ROM?

Not appropriate at all 1 2 3 4 5 6 7 Highly appropriate

12. How satisfied are you that the content of the CD-ROM will help you to care for people living with HIV in a more culturally sensitive manner?

Not satisfied at all 1 2 3 4 5 6 7 Highly satisfied

13. What other features would you like to see added to this educational program (CD-ROM)?

Discussion question

14. Since completing the pre-test for this educational program (CD-ROM), have you attended any HIV related educational program that increased your HIV knowledge?

Yes

No

15. Has there been an event in your life since completion of the pre-test, other than the educational program, that would increase your HIV knowledge?

Yes

No

APPENDIX O

University of Colorado -- Evaluation Questions

University of Colorado -- Evaluation Questions

Please answer the following questions in regard to the educational program CD-ROM (Computer Assisted Instruction strategy) entitled, "HIV/AIDS Prevention, Early Intervention Health Promotion" --- a continuing education program.

1. How satisfied were you with the effectiveness of the graphics?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied
At all						

1. How satisfied were you with the readability of the font size?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied
At all						

2. How satisfied were you with the visual appearance of the content information for the educational program (CD-ROM)?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied
At all						

3. How satisfied were you with the sound quality of the educational program (CD-ROM)?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied
At all						

4. How satisfied were you with the layout design of the educational program (CD-ROM)?

1	2	3	4	5	6	7
Not Satisfied						Very Satisfied
At all						

5. How satisfied were you with the ability to navigate through the sections of the CD-ROM without problems?"

1 2 3 4 5 6 7
Not Satisfied Very Satisfied
At all

6. If not satisfied with the educational CD-ROM, please tell us what problems you encountered.

APPENDIX P

CEU and CME Certificates

University of Colorado at Denver & Health Sciences Center School of Nursing
Professional Development and Extended Studies

CONTACT HOUR CERTIFICATE

This is to certify that

«Name»

completed

HIV/AIDS Prevention, Early Intervention and Health Maintenance: A Self- Study Module for the Primary Care Provider
in

«LOCATION»

on

«DATE» and earned «CONTACT_HRS» Contact Hours

Permanent CE
Record

Director, Professional Development
and Extended Studies

University of Colorado at Denver & Health Sciences Center-School of Nursing is an approved provider of continuing education by the Colorado Nurses Association, an accredited approver by the American Nurses Credentialing Center's Commission on Accreditation for the approval period of July 1, 2003 through June 30, 2006. CEU Provider #UHS-0303
University of Colorado at Denver & Health Sciences Center, Office of Professional Development & Extended Studies, 4200 East Ninth Avenue, Campus Box C268-8, Denver, Colorado 80262 (303) 315-8691.

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE
OFFICE OF CONTINUING MEDICAL EDUCATION

CREDIT CERTIFICATION

University of Colorado School of Medicine

certifies that

Participant Name MD

has participated in the educational activity titled

HIV/AIDS Prevention:
Early Intervention & Health Promotion:
A Self-Study Module for the Primary Care Provider

Release date: October 2003

Expiration date: October 2005

and is awarded

5 category 1 credits toward the AMA
Physician's Recognition Award

The University of Colorado School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The University of Colorado School of Medicine designates this educational activity for a maximum of 5 category 1 credits toward the AMA Physician's Recognition Award.

Each physician should claim only those credits that he/she actually spent in the activity.



Richard E. Bekemeier, MD
Associate Dean for Continuing Medical Education

UNIVERSITY OF COLORADO SCHOOL OF MEDICINE
OFFICE OF CONTINUING MEDICAL EDUCATION

CERTIFICATE OF PARTICIPATION

University of Colorado School of Medicine

certifies that

Participant Name PA-C

has participated in the educational activity titled


HIV/AIDS Prevention,
Early Intervention and Health Promotion:
A Self-Study Module for the Primary Care Provider

Release date: October 2003
Expiration date: October 2005

The University of Colorado School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

The activity was designated for 5 AMA PRA category 1 credits.

Each participant should claim only those credits that he/she actually spent in the activity.


Richard A. Bakemeier, MD
Associate Dean for Continuing Medical Education

APPENDIX Q

Congratulations Page



Congratulations!!!

You have completed the post-test for the educational CD-ROM program, “HIV/AIDS Prevention, Early Intervention, and Health Promotion” --- a continuing education program. In approximately 3 to 4 weeks, your continuing education certificate will be mailed to the address you provided at the end of the pretest. You will be sent an email with your post-test score. If the post-test score is below the required 75% to qualify for continuing education credits/continuing medical education, it may be repeated one time.

Again, we thank you for your participation in this evaluation research study. Because of the time and effort you volunteered, future educational programs will be improved based on the comments and suggestions you provided.

Paula Reid RNC, WHCNP, PhD(c) Principal Investigator

APPENDIX R

Pass E-Mail

Pass Email

Congratulations!! I am pleased to inform you, that you have successfully completed the “HIV/AIDS Prevention, Early Intervention, and health Promotion” educational CD-ROM educational program. You have “passed” the final program post-test with a score of “??.” Your educational program packet of information has been mailed to the Mountain Plains AIDS Education and Training Center in Denver, Colorado for processing. The CE certificate will be mailed to you within 3 to 4 weeks from the University of Colorado at Denver, Health Science Center – continuing education department.

Again, we thank you for your participation in this CAI evaluation research study. Because of the time and effort you volunteered, future educational programs will be improved based on the comments and suggestions you provided.

Paula Reid RNC, WHCNP, PhD(c) Principal Investigator

APPENDIX S

Need To Retake E-Mail

Participant Name:

Thank you for participating in the evaluation research project for the educational program, "HIV Prevention, Early Intervention, & Health Promotion" CD-ROM --- a Computer Assisted Instruction (CAI) strategy. We are sorry to inform you that you didn't score the required 75% on the post-test. Your score was "??." But, it's not the end and you still have another chance.

We strongly desire all participants to obtain the certificate of successful completion in the form of CEU/CME. Therefore, a separate web site has been set up for all participants that score below 75% to retake the case study section (only) of the post-test. It will be the same case study and questions. We suggest that after reviewing the CD-ROM, with close attention to the case study post-test information covered, you give it another try.

Go for it!!

<http://www.elite-research.com/dev/TakeSurvey.asp?SurveyID=31K8n30I9p53G>

Elite Research