HIV Risk Among Nursing Students in Rwanda: Self-Efficacy, Knowledge and Attitudes

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HIV RISK AMONG NURSING STUDENTS IN RWANDA:
SELF-EFFICACY, KNOWLEDGE AND ATTITUDES

By

Jacqueline Wosinski

A Dissertation in Partial Fulfilment of the Requirements for the
Degree of Doctor of Public Health in Health Promotion and Education

June, 2008
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ABSTRACT OF THE DISSERTATION

HIV Risk among Nursing Students in Rwanda: Self-efficacy, Knowledge and Attitudes

by

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Doctor of Public Health Candidate in Health Promotion and Education

Loma Linda University, Loma Linda University, 2008

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Acquired immune deficiency syndrome (AIDS) is the leading cause of death in sub-Saharan Africa. With a prevalence rate of 3.1% in 2006, Rwanda is one of the hardest hit countries. Nurses are often the leading health professionals in rural communities and at the forefront of the fight against the HIV pandemic. Little has been written on how nurses are prepared to intervene successfully along the continuum of HIV prevention and care. A mixed-methods sequential exploratory approach was used to explore this question.

In the first phase, cognitive, socio-psychological, and environmental factors of nursing education in Rwanda in regard to HIV prevention and care were qualitatively explored using grounded theory-guided data collection and analysis. Key informant interviews with nursing students, nursing practice instructors and nurses (N=25) completed by observations elicited three themes affecting nursing students' preparedness: perceived risk in the context of stretched resources, sexual risk prevention education and psycho-social counseling. These themes were linked with lack of emotional and cognitive
preparedness to care as well as people living with HIV/AIDS (PLWHA) stigmatization among nursing students.

The results of the qualitative study were used to develop a questionnaire as a means of exploring and comparing HIV knowledge, attitudes, experience, expectations and their relationship to counseling self-efficacy among 2\textsuperscript{nd} and 3\textsuperscript{rd} year nursing students in Rwanda (N=203). In this cross-sectional design, respondents completed an anonymous, self-administered questionnaire. T-tests and chi-squares revealed that 3\textsuperscript{rd} year students had insufficient HIV transmission and prevention knowledge and had built a moderate level of counseling self-efficacy, but reported a lower degree of stigmatization and higher counseling expectations. They also reported more experience with PLWHA care, although 13\% had not yet provided care to PLWHA. Multiple regression analysis revealed that being affiliated with the Catholic Church, correct knowledge and PLWHA care experience significantly predicted counseling Self-Efficacy.

Results point to a lack of readiness to participate in HIV prevention and care activities among nursing students in Rwanda. Results support the need to contextualize training, discuss culturally imbedded beliefs, emphasize self-efficacy building and strengthen psychosocial counseling and health education skills among students. Results of this study will inform the design and implementation of future nursing training programs.
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CHAPTER 1
INTRODUCTION

A. Statement of the Problem

In 1999, 11% of adult Rwandans and close to 10% of those sexually active under 20 years of age were HIV positive (HIV+); AIDS is a leading cause of death in the country. Causes include: multiple sex partners, first sexual intercourse at an early age, commercial sex as well as resistance to condom use and to discussions about sex (Joint United Nations Programme on HIV/AIDS, 2000; UNAIDS).

Findings from different countries consistently suggest that nursing students have the same rate of risky sexual behaviors as other students and that there is no correlation between knowledge and preventive behavior. According to the results of a study done in Benin, college and nursing students have an adequate knowledge of HIV transmission and prevention methods but only half of them practice safe sex (Fourn & Ducì, 1993). Moreover, unless they have had a specific skills training program, graduating nursing students express fear of patients diagnosed with AIDS.

A measure of factual knowledge indicates the extent to which each student has accurate and complete information about HIV. However, as stated earlier, knowledge alone has repeatedly failed to be correlated with lower incidence of HIV risk taking behaviors. To achieve behavioral change, learning programs need to address participants’ affectivity. According to Bandura (1977b), self-efficacy integrates the cognitive, affective and behavioral components of education. A comprehensive nursing education leading to
effective skills acquisition needs to integrate vicarious learning and modeling. In turn, to lead effective health education programs in the hospital and community setting, nurses in the function of lay health educators should model successful HIV prevention skills in their own lives. To know what skills the students would need to learn, we need to understand barriers to successful HIV preventive behavior, both on the personal and professional level and domains in which nursing students don’t feel confident they can prevent getting infected. Nursing students need to be recipients of effective health education before they can become lay health education leaders.

B. Purpose of Study

The purpose of the study is to explore the relationships between factual knowledge, attitudinal factors, barriers, enactive experiences and outcome expectations regarding HIV professional prevention and care among 2nd and 3rd year nursing students in Rwanda.

C. Research Aims

To qualitatively investigate factual knowledge, attitudinal factors, barriers and enactive experience regarding professional HIV prevention and care among nursing students in Rwanda.

To compare factual knowledge, attitudinal factors, outcome expectations, enactive experiences and HIV counseling self-efficacy among 2nd and 3rd year nursing students in Rwanda.
To explore multivariate relation of independent variables, factual knowledge, attitudinal factors, enactive experiences, outcome expectations and dependent variable HIV counseling self-efficacy among 2\textsuperscript{nd} and 3\textsuperscript{rd} year nursing students in Rwanda.

1. Hypotheses

There is a difference between 2\textsuperscript{nd} and 3\textsuperscript{rd} year nursing students in Rwanda regarding factual knowledge, attitudinal factors, outcome expectations, enactive experiences and HIV counseling self-efficacy related to professional HIV prevention.

There is a positive relationship between factual knowledge, attitudinal factors, enactive experiences, outcome expectations and HIV counseling self-efficacy.

D. Significance to Major Field

More health education research needs to be conducted in developing countries and particularly in Africa. The prevalence of HIV is still increasing. After reviewing about 100 articles on HIV research in Burkina Faso, Desclaux (1997) concluded that a key to efficient health education strategies may be the understanding of professionals’ AIDS prevention attitudes. Both literature reviews and quantitative research underline the need to expand the body of knowledge about nursing students in Africa and their attitudes and behaviors toward HIV. We assess barriers to HIV preventive behaviors (including barriers to self-Efficacy) among Rwandan nursing students. The study contributes to a better understanding of the relationships between knowledge, self-Efficacy, outcome expectations and preventive HIV behaviors among nursing students in Rwanda. This research conducted among nursing students accessorially deepens the understanding of
young adults' HIV sexual preventive behaviors in Rwanda. In all its purposes, the study contributes to health education research.

Human immunodeficiency virus (HIV) remains a major public health problem in Rwanda. Nurses are often the only health professionals available and need to intervene as lay health educators. At this point in time however, hard and soft data indicate that African nurses are often unable to fulfill their role of care and counseling of HIV+ patients. The lack of knowledge or means, fear and prejudice has been cited as causes for this phenomenon. These elements needed to be investigated in the Rwandan context. The Jakarta Declaration on Health Promotion (1997) stressed the effectiveness of comprehensive approaches. It called upon health settings and health professionals to participate in global health promotion efforts. Nurses in Rwanda may act as experts due to their knowledge and social position and may be models in their community. One aim of preventing the spread of HIV in this group would be to keep this professional workforce operational. Strengthening nurses' self-efficacy in facing the fear of AIDS, using universal precautions and practicing safe sex may represent a sensible health investment. Their teaching and modeling concerning HIV prevention, as lay health educators in the professional as well as in the private setting, could play an important role in fighting the pandemic and ultimately reducing the incidence of HIV among Rwandans. One long-term aim of this study is to lead to a theory-based intervention supported by our findings.
CHAPTER 2
LITERATURE REVIEW

Human immunodeficiency virus (HIV) is a leading cause of death in sub-Saharan Africa and an unprecedented tragedy affecting societal organization, economy, education, health and ethics. Epidemiological data is overwhelmingly tragic. In 2002, out of five million newly infected people worldwide, 800,000 were children and 3.5 million lived in sub-Saharan Africa. Out of 42 million people worldwide living with AIDS, 70% lived in sub-Saharan Africa (UNAIDS/HIV, 2002). It should, however, not prevent us from seeing the efforts made by families to survive and by many grassroots organizations to stop the spreading of the epidemic and to take care of the sick and their relatives. Sadly, nurses despite their expertise in the field of health, disease and prevention don’t seem to be at the forefront of these movements. Environmental conditions, lack of transfer from knowledge to skills and lack of confidence in one’s own ability to deal with risk factors may affect nursing students’ attitudes toward HIV. The social cognitive theory and especially the self-efficacy and outcome expectancies constructs may be important explanatory and problem-solving tools.

A. The Research Deficit

Less than 10% of global spending on health research is devoted to diseases or conditions that account for 90% of the global disease burden. Low/middle-income countries carry 85% of the world population and 92% of the global disease burden. The
rate for communicable diseases is 13 times higher in low/middle-income countries than in high-income countries (Currat & Lucas, 2000). After malnutrition and water/sanitation, unsafe sex is the third risk factor weighing on the global burden of disease (Frenk & Murray, 1999). Behavioral-related research in HIV reflects this trend. Most research has been done in the US (Currat & Lucas, 2000).

B. HIV in Rwanda

1. Epidemiology

Acquired Immune Deficiency Syndrome (AIDS) has become the leading cause of death in sub-Saharan Africa. In 2000, 3.8 million inhabitants became infected with HIV and 2.4 million died of AIDS, compared to 1.5 million and 642,000 respectively for the rest of the world. More than 25 million Africans from sub-Sahara lived with HIV, compared to 10.8 million for the rest of the world. Fifty five percent were women. One third were between 15 and 24 years of age (Johns Hopkins University Info Project, 2001).

In 2006, the HIV prevalence rate among adults, ages 15 to 49, was 3.1 per cent (UNAIDS, 2006); AIDS is the leading cause of death in Rwanda. Causes include multiple sex partners, first sexual intercourse at an early age, commercial sex as well as resistance to discussions about sex and resistance to condom use. The HIV prevalence among antenatal clinic attendees in Kigali, the nation’s capitol, through 1995 was 25-33%. The prevalence may be lower in rural areas. In 1997, 0.1 condoms were available per capita. In 1992, 26.7% of Rwandan women were pregnant by age 19 (UNAIDS,
2000). The number of young people infected with HIV and the high teenage pregnancy rate indicate the need to target children and adolescents for HIV prevention education.

The socio-economic costs of the epidemic in sub-Saharan Africa are staggering. More than eight million orphans have parents who died of AIDS. They may rely on overtaxed extended family for help. This system of mutual care sags under the burden of AIDS. Grandparents often become the caregivers. Orphans may try to lead a household of siblings. Many end up on the streets. Agriculture suffers from the lack of skilled adult workers. As a result, the economic problems of the continent have increased. Resources spent on HIV are taken from other vital areas such as education or economy (World Bank, 2000). The virus has also taken its toll on professionals, which impairs education and the future growth of African nations. In Zambia and Malawi, more than 30% of teachers are infected (UNAIDS, 1998). There is no indication that the rates are lower for nurses.

2. Behavioral and Socio-Cultural Contributing Factors

Major factors contributing to the pandemic in Rwanda are little or no condom use, multiple and overlapping sexual partners, older males having sex with teenage or young adult girls, women’s dependence on marriage and prostitution as well as migration and business travel (UNAIDS, 1999).

Factors known to reduce the pandemic are abstinence, delaying first sexual intercourse, fidelity, safe sex that implies condom use for every sexual encounter if fidelity is not certain or if one partner is HIV+, no sexual intercourse with unknown partners and limiting the number of sexual partners (UNAIDS, 1999). In a study
conducted among adolescents after onset of sexual activity (mean age = 16.2 years), an association was detected between condom use and being male, a factor that is consistently supported by literature, and a history of limited risk behaviors. When adolescents engage in risk behaviors, they generally do so in more than one domain. For example, binge drinking is associated with unsafe sex. In the same study, perception of condom use by friends and the degree of general impulsive attitudes predicted the intention to use condoms or not (Brown, DiClemente, & Park, 1992). In several parts of Africa, condom use may be associated with prostitution or loose morality (Maharaj, 2001).

Studies done in different countries of sub-Saharan Africa point to several specific practices that increase the risk of HIV transmission. Anal sex may be practiced as a contraceptive method or may be associated with commercial sex (Courtois, Mullet, & Malvi, 2001). Reports from Malawi and Nigeria indicate that female students may need to have a “sugar daddy” to provide them with clothing or other items in exchange for sex, also known as survival sex (Rivers & Aggleton, 2002). These risks need to be assessed in the Rwandan culture through a qualitative research based on grounded theory. This process may be used to provide an in depth understanding of thoughts, emotions and cultural context of nursing students’ sexuality. It will clarify concepts and relationships pertinent to HIV prevention (Strauss & Corbin, 1998).

In the Rwandan culture, sex is not usually discussed with young people. It is a private matter. This conservative culture does not condone sexual promiscuity for women. Single men on the other hand may use the services of sex workers and put
themselves and their future wives at risk (Vidal & Desgrees du Lou, 2001). A study done among nursing and midwife students in Bulawayo, Malawi, corroborated these findings (Verkuyl, 2000). Nurses who want to help prevent the spread of HIV will have to address not only individual behaviors, but will also need to take socio-cultural factors into account.

C. Nurses and HIV

To achieve sustainable health care, it is vital that nurses learn to care for themselves as well as others and do not succumb to the HIV epidemic.

1. Role of the Nurse in Rwanda

In Africa, there are 12000 inhabitants per doctor and 3000 per nurse compared to 500 inhabitants per doctor and 150 per nurse in the US. The physician often has a practice in the city, works in a hospital or has a managerial position. In rural areas, nurses treat most of the patients and often oversee community health workers (Lankinen, Bergstrom, Makela & Peltomaa, 1994).

In Rwanda, nurses may easily become leaders and initiate action. The educational role of the nurse in Rwanda addresses not only the individual patient, but also the community. The nursing curriculum includes, for example, family planning education (Direction des programmes de l’enseignement secondaire, 1988b). The nurse has the opportunity to come in regular contact with the population, particularly women in childbearing age. Between 1990 and 1999, health personnel attended 26% of births in Rwanda. However, attendance is probably higher in urban than in rural areas. Between 1995 and 1998, 77% of one year old children received full immunization for diphtheria,
poliomyelitis and tetanus (WHO, 2000a). This indicates that nurses doing immunization clinics have access to most of the population of females and young children.

Brown and Waybrant (1988) showed that teaching patients about their diagnosis and related self-care should be nurses’ main activity. Preventive testing and counseling has been proven to reduce the risk of HIV. Di Scenza, Nies and Jordan (1996) found a significant change in high risk sexual behavior among 20 HIV+ patients from an inner-city outpatient clinic, three months after a counseling session with a nurse. Allen, Serufilira, Bogaerts and Van de Perre (1992) found in a Rwandan study that counseling HIV positive women and their partners decreased the incidence of HIV transmission from 4.8 to 1.8%. It also decreased positive gonorrhea cultures among HIV+ women from 13 to 6%. Nurses trained in counseling for HIV can play a major role in reducing the epidemic. After a qualitative study conducted in Soweto, South Africa, the authors defined three objectives of HIV counseling: emotional support, information and guidance in decision-making and problem-solving (Stein & al., 1997). However, to fulfill this function, nurses need to receive adequate training and face their fear of HIV contamination.

2. Nurses’ Susceptibility to HIV Infection

The HIV pandemic has modified the nurse’s role. The risk of professional infection is real and present in every exposed professional’s mind.

a. Nurses and Risk on a Personal Level. Nursing students and nurses are as exposed to the risk of HIV infection through sexual contact as the general population. There is no indication that nurses have a lower incidence of HIV. In 1991, Williams
found that 5.800 (0.76%) of AIDS afflicted Americans were nurses. The large majority were men who had been contaminated through sexual intercourse. Moreover, studies indicate that professional medical knowledge doesn’t induce a change in behavior. An investigation conducted among 115 male and female nursing students of Cotonou, Benin, examined their knowledge and preventive behaviors regarding HIV as well as their attitudes toward patients infected with HIV. Ninety-eight percent of the nursing students demonstrated a satisfactory medical knowledge of AIDS. However, only 55% of them regularly used condoms and 77% were reluctant to care for HIV+ patients (Fourn & Duci, 1993). Providing clear and relevant information is essential to the success of an educational program, but cannot be the only component of it.

b. Nurses and Occupational Hazard. Among health care workers in the US, nurses are the group most exposed to the occupational risk of HIV infection (Stine, 2001). A study done among 83 paramedics in England showed a 20% underreporting of needlestick injuries (Gaffney, Carrigan & Johnson, 2000). In a study conducted among nurses in South Africa, Elhers (2006) indicates that fear of HIV infection linked to lack of protective measures induces employment attrition among nurses.

Nurses may knowingly or not be exposed to the HIV infected body fluid of their patients. Some patients may be declared HIV+, but all patients who didn’t undergo HIV testing are potentially contagious. This is why precautions to prevent contamination should be used by professionals for each patient, regardless of their blood-borne infection status. In 1987, the US Centers for Disease Control (CDC) issued the “recommendations for prevention of HIV transmission in health care settings,” referred to as universal
precautions. They aimed at preventing all contact with blood that could possibly contain pathogens. The Body Substance Isolation System (Gerberding, 1991), which was designed to avoid professional contamination in high prevalence areas, had the same goals, but related precautions to the degree of contact with body fluids or mucous membranes. Later as described by Garner (1996), the CDC combined both methods in the standard precautions.

Actual cases of occupational HIV transmission are linked solely to blood contamination. As described by Tait (1995), percutaneous exposure accounted for 84% of the documented occupationally acquired HIV cases in 1992. The risk of becoming infected with HIV through pricking with a contaminated needle (0.67%) is greater than for having anal or vaginal intercourse with an HIV+ partner (respectively 0.56% and 0.40%). It is a frequent occupational hazard unless appropriate precautions are taken (Kamps, Brodt & Helm, 2000). In 1997, Miller found that, each year in the US 800,000 needle stick injuries occur, 16,000 of which are HIV contaminated. Non-recapping of needles reduces the risk of injury by half. Infection of another member of the staff or a patient by a contaminated piece of equipment has also been documented (Stine, 2001).

However, health care workers have a much lower risk of contracting HIV professionally than sexually. Marcus (1988) calculated a 1/300 risk of becoming infected through blood contamination for health workers. These figures may be too conservative for a country like Rwanda where the exposure to HIV infected patients is much higher than in the US. In the nations of Cote d'Ivoire, Zambia and Zimbabwe, 50 to 80% of the patients are infected with HIV (World Bank, 1999). In Rwanda, nurses have access to
disposable syringes and needles, at least in the main hospitals. They also usually use needle disposer. The situation in rural clinics hasn’t been assessed. Gloves are less available and may have to be recycled locally. Sterilization measures vary from autoclave to pressure cooker, both recommended by the World Health Organization (WHO). The HIV virus is inactivated by 20 minutes of boiling or chlorine based chemicals such as bleach or 70% alcohol. Each piece of equipment that has been used should either be disposed of or dismantled after disinfection and thoroughly cleaned. In Rwanda, waste is usually buried in a deep pit (WHO, 2000b).

Lack of trained workers may also increase the risks. In a study conducted in Morocco, researchers found that 85% of the 266 health workers had been exposed to patients’ blood. Only 7.1% of the accidents had been reported. Causes for injuries cited by the health workers included working too fast (57.8%), inattention (51.8%) and not conforming to precautions. More than 48% of the workers still recapped the needles after use. Physicians and professionals who had received specific training or worked in the infectious disease ward were better informed on occupational HIV related hazards and had fewer accidents. Findings in Benin gave evidence of insufficient technical knowledge on HIV transmission for 60% of interrogated health professionals (Fayomi, Zohoun, Josse, Catraye, & Akinocho, 1994).

A study conducted among 90 health care workers in two main cities of Cote d’Ivoire indicated that their awareness of risk increased parallel to their interaction with high-risk patients. Uncertainty about how to avoid professional contamination led health workers to refuse to engage in certain procedures. It also led some of them to abandon
their profession (Diarra, Msellati, Brissac, Gordon & Rey, 1996). A thorough instruction about universal precautions and adequate equipment would greatly relieve nurses’ fear to contract HIV through their occupation.

However low, the risk for occupational HIV infection exists and can be greatly reduced by adequate use of the universal precautions. Nonetheless, if nurses don’t receive adequate support to deal with their fear of HIV, they may withdraw from giving adequate care to their HIV+ patients.

3. Nurses’ Attitudes Toward HIV

In a survey conducted among physicians, nurses and non-health workers in the university hospital of Ilorin, Nigeria, the authors assessed knowledge and attitudes toward the care of HIV+ patients. One third of the nurses and one fourth of the physicians hesitated to treat a patient with AIDS (Adelekan, Jolayemi, Ndom, Adegboye, Batatunde et al., 1995). Nurses’ attitudes toward HIV need to be addressed both at the personal and professional levels. It may in some instances be difficult to notice the difference between the two. Prejudice, burnout, fear or lack of equipment may interfere with the care for patients. A survey conducted among health care workers in Bamako, Mali, showed that consultations of HIV+ patients are shorter, include fewer physical examinations and a longer waiting time. The health care workers cited the lack of gloves as a cause for their behavior. They listed sadness, pity and fear as their main feelings. They also expressed fear of needles and trash bins (Diarra, 1999). The emotional burden of caring for PLWA among health care workers in areas where etiologic and symptomatic medications are sparse requires targeted interventions.
Nurses in Africa may not take advantage opportunities for education about safe sexual practices. In a cross sectional study conducted among hospital based physicians and nurses of Kampala, Uganda, 31% of health workers had never advised symptomatic patients to be tested and 59% of nurses did not refer patients to HIV counseling. They gave time constraints and lack of confidence in their skills to counsel properly as their main reasons for failing to educate the patients. Moreover, 29% of them perceived recapping needles as a low risk professional hazard, but casual contact with patients and condom use as high risk activity (Mugherera, Van der Straten, Hall, Faigeles, Fowler et al., 1997).

The HIV pandemic raises many issues among African nurses. Research reviewed in this section suggests that lack of knowledge and low sense of self-efficacy for using universal precautions may lead nurses to refuse care to PLWHA. Their personal beliefs and behaviors may not reflect safe sexual practices and may interfere with their teaching role and prevent them from being role models.

4. Nurses as Role Models

Policies written over the years, starting with Florence Nightingale and continuing through the International Conference on Primary Health Care (Declaration of Alma-Ata, 1978) have stressed the educational role of nurses. The Jakarta Conference on Health Promotion (1997) underlined participation of health professionals as a necessary component of comprehensive and successful health promotion programs. The holistic approach to nursing includes self-awareness and self-development strategies as tools for more effective counseling with the client (Schank, 1999). Modeling by a person of
knowledge, status and power can motivate the process of behavior change in another (Soeken, Bausell, Winklestein & Carson, 1989). Bandura (2000a) considers vicarious experience, learning through watching someone else experiment with the desired behavior and observing the results of success, as important components of a self-efficacy-based educational intervention.

Alderman (2001) indicates several venues to nurses’ behavior change and adaptation to new challenges. She particularly insists on system and critical thinking as well as on compassion and self-examination. She interprets role modeling as a way to guide without controlling. Current trends in nursing care insist on the proactive role of patients. Research indicates that decision-making promotes behavior change. Nurses need to develop an empowering attitude (Roberts & Krouse, 1995).

Nurses need to break the rule of silence on sexual behaviors, foster advocacy and serve as role models (WHO, 2000b). To be credible role models, nurses need to practice the recommended behaviors themselves (Kinney and Erickson, 1990). Their training should provide opportunities for pertinent behavior acquisition.

D. Nursing Students and HIV

1. Students and High Risk Sexual Behavior

a. Students in General and High Risk Sexual Behavior. In 1991-1994, HIV incidence in Uganda was higher among pregnant women, age 15-24, with post primary education than women with primary or no education. In 1995-97, the effect was inverted (Kilian, Gregson, Ndyanaangi, Walusaga, Kipp, et al., 1999). The higher rate of infection during the first period may be attributed to the fact that educated women sought
help more readily. Education provides women with more financial security and is usually regarded as a protective factor against high risk sex among women.

Social science students of the University of Bophuthatswana, South Africa, demonstrated a general knowledge about AIDS, but indicated a high number of sexual partners. A minority used condoms and then only sporadically. The students received information mainly through peers and not parents, teachers or lecturers (Kaya & Kau, 1994). The lack of targeted programs, but mainly the strength of peer education may account for these findings.

b. Nursing Students and High Risk Sexual Behavior. In a survey of 283 female Canadian nursing students, Zimmer and Thurston (1998) found that more than 90% of the students had accurate information about HIV. Sixty percent felt susceptible to HIV on a personal level. Students with post-secondary education had significantly more positive attitude toward condom use than those with only high school education. Eighteen percent of sexually active students under 25 never used condoms. There was no connection between condom use and number of partners. Compared to a study done among university students in Canada, in 1988, there was no difference in number of sexual partners and abstinence. In Africa, female nursing students seem to have significantly fewer sexual partners than males. The percentage of male nursing students using condoms regularly has been stable from 1992 to 1995 in Cotonou, Benin (Fourn, Fayomi, Massougbodji & Zohoun, 1997). These findings suggest that nursing students are not different from other students in their HIV preventive behaviors and that behaviors don’t change over time despite HIV prevention campaigns.
2. Nursing Students and Occupational Hazard

A large minority of nursing students fears contracting HIV through contact with PLWH and has an exaggerated perception of risk. However, as knowledge about HIV increases, fear diminishes and willingness to care for HIV patients increases (Gignac & Oermann, 1991). Nurses in a bachelor of nursing program at the University of Ibadan, Nigeria, received instruction on HIV, PLWHA care and universal precautions, based on social cognitive theory. The author reported an increase in knowledge about HIV, of compliance with universal precautions and of positive attitudes toward HIV+ patient care. Given such approaches, behavior change is possible (Uwakwe, 2000).

3. Nursing Students and Attitudes Toward HIV

A study done in Sydney, Australia measured change in knowledge, attitudes and willingness to care for patients after a knowledge, attitudes and problem solving based educational intervention among registered nurses. Results indicated significant change in knowledge and willingness to work with HIV+ patients. Attitudes toward PLWH or concern about the risk of occupationally acquired HIV didn’t change significantly (McCann & Sharkey, 1998).

Nursing students may reject victims of HIV. They may blame their lifestyle, suspecting prostitution, drug addiction or homosexuality (Li et al., 1993). However, Gignac and Oermann (1991) found that when a student personally knew a man who had sex with other men, their willingness to care for PLWHA increased. Comfort in caring for HIV+ patients increases as nursing students have the chance to interact with AIDS
afflicted persons (Bowman, Brown & Eason, 1994). Nursing students should have the opportunity to challenge their beliefs and values during their training.

4. Role of Gender Differences

Nursing students in Rwanda learn about family planning and STDs prevention. These subjects are laden with gender issues, distribution of power and the socio-cultural view of men and women’s role in society. Gender affects the exposure to HIV. Women are more vulnerable for physiological and socio-cultural reasons.

Biologically, women are more susceptible to HIV infection and other STDs. “Transmission of HIV from male to female is 2 to 10 times more effective than from female to male” (Stine, 2001). The virus is more concentrated in semen and the vaginal area has a larger mucosal area. Moreover, STDs weaken the mucous membrane barrier and increase the risk for HIV (La Ruche, Djeha, Boka-Yao, Digbeu & Coulibaly, 2000). Females are also at a disadvantage socio-culturally. Many people associate condom use and contraception with women of loose moral principles (Desclaux, 1997). Females may also for economic or hierarchy reasons have little power in negotiating safe sex (Waldby, Kippax & Crawford, 1990).

Of a cohort of 921 women in Kigali, Rwanda, after 24 months of follow-up, 21% of women in steady relationships reported physical violence, which was associated with male testing HIV positive. A third of the women reported sexual coercion that was associated with women testing HIV positive. Predictors of violence included: condom negotiation, partner’s alcohol abuse, financial inequality and refusal to have sex (Van der Straten, King, Grinstead, Vittinghoff, Serufilira et al., 1998). A qualitative study
conducted among Xhosa speaking female teenagers in South Africa revealed that coercion was normative, often associated with gifts of money or clothes and sometimes confused with love (Wood, Maforah & Jewkes, 1998). These findings show that HIV preventive behaviors are linked with social issues such as alcohol abuse, negotiation skills, economic conditions, family planning and violence. Men are consistently shown to practice safe sex more frequently than women (Brown, DiClemente & Park, 1992). Women have little negotiation power and yet, the responsibility of safe sex is often left to them (Maharaj, 2001). Heinrich (1993) showed that women who have undergone forced sexual intercourse had a lower sense of personal control on contraception. Wingwood and DiClemente (2000, 1998) reported that a history of abuse among women is correlated with a high prevalence of STDs and an unlikelihood to negotiate condom use. These findings indicate the need to investigate sexual violence in connection with the HIV epidemic.

The needs of men and women must be addressed separately. Peer groups have repeatedly been reported as effective agents of behavior change. The WHO encourages the creation of women’s groups aimed at HIV prevention (WHO Fact Sheet, 2000). How nursing students understand gender issues and their values regarding this subject may need to be clarified.

5. Nursing Curriculum

The subject of HIV appears in several segments of the A2 nursing curricula in Rwanda: uro-genital pathology, family planning, ethics, adolescent development, gynecology, obstetrics and infectious diseases (Direction des programmes
de l’enseignement secondaire, 1988b). A closer look at the family planning curriculum shows that most of action verbs used in the curricula such as: define, cite, explain, specify or identify imply a cognitive activity. The curricula emphasize knowledge rather than value clarification and skills. But as Bandura (2001) states, only a specific sense of self-efficacy ensures that a behavior will occur; motivation does not suffice to induce behavior change. Objectives of a psychomotor nature such as “give advice helping to overcome barriers” may be transformed in a cognitive one if the students are asked to list the possible advices. One of the general objectives is “increase awareness in the general population about demographic problems.” This objective is of a psychomotor nature but does not translate into relevant suggested activities in the development of the curriculum. If students acquire sufficient knowledge, they also need to apply it successfully in the professional setting. Their effectiveness as nurses will depend on how much training they have received. The methods nursing instructors develop in their lesson plans, their own comfort with the subject of HIV and their role modeling will tremendously affect the students’ ability to effectively address the HIV epidemic.

E. Social Cognitive Theory and HIV Education for Nursing Students

Social cognitive theory is a theory of learning. The central construct of self-efficacy is based on some of the same principles as the current learning theory used in nursing science schools in Rwanda. The construct presupposes three reciprocal causal determinants of a given activity: cognitive internal personal factors, affective internal personal factors and behavior. The weight of each component may vary according to the nature of the activity (Bandura, 2000b). Furthermore, the theory acknowledges the need
to break general goals in smaller proximal ones that more effectively induce task learning. Subgoals provide measurable criteria for success and thus increase the sense of self-efficacy among those who achieved a satisfactory performance (Bandura, 2000c).

1. Overview of the Theory

Social cognitive theory makes the assumption that one’s perceptions about an action mediate the path from information to behavior. Assessing factual knowledge evaluates the amount and accuracy of information acquired by the student about HIV prevention. However, declarative knowledge is only one aspect of skill mastery (Bandura, 2000d). Many other factors such as self-regulatory processes, interpersonal skills, a sense of personal efficacy and the perception of the value of outcome will determine the level of competency in sexuality or occupational hazard management (Bandura, 2000e). Nursing education on HIV needs to integrate all these factors and give opportunities to experience vicariously and personally effective behaviors. Social cognitive theory seems to operate successfully in geographic and socio-cultural settings around the world (Bandura, 2002). Social cognitive theory stipulates that for change to occur, the student must be exposed to information, modeling, role-playing and feedback. Programs for teenagers including these elements have been shown to reduce unprotected sex and unwanted pregnancy incidence in comparison to information programs only (Jemmott, Jemmott & Fong, 1992). A nurse who has a low sense of personal control will be more vulnerable to social pressures and intrapersonal factors. These factors will influence a behavior more strongly than the perception of HIV related risk.
2. Self-efficacy

a. Difference Between Self-efficacy and Self-esteem. Self-esteem isn’t necessarily linked to the proper execution of an activity. People may have a good level of self-esteem because they don’t challenge themselves much or have little self-esteem because they have high standards. They may not care about their lack of skill because they have no interest in that particular activity. Conversely, they may feel that they can perform in an area, but will not act because it doesn’t enhance their sense of self-satisfaction. Moreover, a person may have good self-esteem in one area such as family life, sport, work or social life and not in others. Self-esteem is not general or specific enough to offer a good measure of how well one person will carry out a specific activity. On the contrary, self-efficacy is skills specific and can be measured accordingly. Bandura (2000f) affirms: “Efficacy beliefs vary across different domains, within the same activity domain at different levels of difficulty and different circumstances.”

b. Definition and Development. Bandura (1977a) states that perceived self-efficacy “refers to beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments.”

Two types of knowledge among other factors contribute to self-efficacy. Factual knowledge refers to the information one receives. The acquisition of problem-solving decision processes is called procedural knowledge. These two competences are pertinent only to the cognitive domain. To be translated into enactment, other sources of self-efficacy are needed (Bandura, 2000g).
Sources of self-efficacy include enactive mastery experience, vicarious experience, verbal persuasion, physiological and affective states and the integration of efficacy information. Enactive mastery experience is the process of learning by personal direct experience through trial and error, self-evaluation and self-modeling. However, this learning process alone would be very time consuming as well as hazardous. This is why vicarious experience is an important part of the learning experience. Vicarious learning takes place through the observation of others. One learns from the model’s behavior. Observing the consequences of the action also provides a learning experience. The learning process occurs through direct observation of skill mastery by family members, peers and educators but also symbolic models. Successful personal and vicarious behaviors weigh on learning more than unsatisfactory ones.

Bandura classifies the skills into two categories: fixed and generative. Fixed skills involve activities that are codified and repeated with little variation each time. Generative skills require adaptation to changing circumstances (Bandura, 2000h). HIV education for nursing students would involve both fixed and generative skills. On one hand certain activities such as giving an injection or putting on a condom need to be executed with precision. However, condom negotiation may have to be adapted to the state of the relationship and universal precautions to the nature of the available equipment.

"People attribute success and failure to four possible factors: their own ability, their effort, the difficulty of the task or situation, or luck" (Valdiserri, 1989). Several reasons may contribute to a low sense of self-efficacy regarding self-protective behaviors, especially in a country where HIV is prevalent. Fear inducing information can discourage
some people. Others may not be familiar with the behaviors involved in HIV prevention. People facing new situations, for which no socio-cultural answer has been provided, find it difficult to implement new behaviors. Those who failed in their attempt to undertake the change will find it difficult to believe that they still may succeed.

c. Self-efficacy and HIV Research. Basen-Engquist (1994) reported a significant difference in the implementation of HIV protective behaviors after a skills mastery intervention versus a traditional information based intervention. Self-efficacy has been reported as a strong predictor for a behavior, including condom use (Dilorio, Maibach, O’Leary, Sanderson & Celentano, 1997). However, studies also demonstrate that to be effective, an intervention must address not only technical skills, but also relational ones. A study conducted among 522 African-American women failed to show a significant relationship between condom application ability and safe sex (Crosby, DiClemente, Wingood, Sionean, Cobb, et al., 2001). Condom use related self-efficacy includes negotiation skills.

In a randomized controlled design, Wingwood and Di Clemente (2000) compared knowledge, attitudes and intentions of nurses to assess adolescents’ risk of contracting HIV and comfort with the procedure among nurses following a didactic workshop or one based on the social cognitive theory. The latter one showed significantly better results on all variables, 8 weeks after the workshops.

Self-efficacy includes all processes leading the student to feel that he/she can successfully perform an action. Self-efficacy and predicts behavior. A behavior can be objectified at multiple levels of performance. In studying self-efficacy, these levels
should not be confused with outcomes that are a byproduct of the behavior (Bandura, 2000i).

3. **Outcome Expectations**

Outcomes follow actions. Personal or vicarious experiences enable us to anticipate the consequences of taking action. Outcome expectations, to a lesser degree than self-efficacy, also predict if a person will carry through with the behavior.

* a. **Theory.** Physical or material incentives to perform a behavior include pleasant sensory experiences. On the contrary, negative sensory experiences will adversely affect the decision to perform a behavior. Social recognition, access to power and financial gain represent powerful social incentives while rejection and penalties are dissuasive.

A person behaves partly according to external stimuli such as physical and social expectations, but each individual also behaves according to his/her own standards. Adhering to their beliefs provides them with a sense of self-satisfaction. Acting out of line with their standards leads to self-censure. Outcome expectations measure the results that a person expects from performing an action. The judgment about the outcome of an action partly depends on one’s perception of self-efficacy. Outcome expectations are indirect predictors of behavior through their impact on Self-Efficacy (Bandura, 2000j). They provide reinforcement for a behavior through the “anticipated satisfactions of desired accomplishments and the negative appraisals of insufficient performance” (Bandura, 1977b).
For certain behaviors, self-efficacy conditions the outcome in such a predictable way that measuring the outcome becomes redundant. However, the literature on sexual behaviors studied in previous paragraphs indicates that outcomes are controlled by self-efficacy but also by other factors such as the socio-cultural milieu and gender. Outcome expectations in the Rwandan context need to be elicited by qualitative research.

b. Outcome Expectations and HIV Research. In a study conducted in 16 clinics, fatalistic attitudes among care providers was associated with significantly less reporting of counseling sessions among HIV+ participants. (Steward, Koester, Myers & Morin, 2006). Six months after participating in an intervention based on the precede-proceed educational factors influencing behavior, primary care reported higher levels of confidence in their HIV counseling skills and outcome expectations (Bluespruce, Dodge, Grothaus, et al., 2001). These findings demonstrate the need to integrate outcome expectations in studies related to sexual behaviors, these being intricately linked with social norms and pleasure.

F. Conclusion

In a review of the impact of sexual and HIV education on the sexual behavior of young people, Grunseit (1997) issued the components necessary to implement an effective program: gender sensitivity, based on social learning theory, fostering onset delay of sexual activity and safe sex practice, addressing social influence, teaching communication and negotiation skills. The present study assesses these components as well as issues regarding the professional role and challenges of nurses in the context of
the HIV epidemic. Barriers to PLWHA care, counseling, modeling and consistent, effective observation of standard precautions emerged from the literature as salient themes.
CHAPTER 3

METHODS

A. Theory and design

1. Justification for Model

Social cognitive theory and more precisely the self-efficacy construct were used as a base for the theoretical model as determinant of behavior. Self-efficacy is both a predictive and intervention construct. To design effective HIV prevention and care training program among nursing students in Rwanda, specific self-efficacy skill levels regarding HIV preventive behaviors and care for PLWH as well as understanding of determinants of efficacious behaviors of nursing students in Rwanda had to be assessed. This was crucially important in the context of HIV in Rwanda.

Many well-researched factors such as self-regulation or vicarious learning are conductive to self-efficacy and would be necessary components of a skills based intervention. However this study aimed at expanding the body of knowledge on HIV preventive behaviors of nursing students in Rwanda. The self-efficacy construct was studied in relationship to other determinants of HIV risk prevention such as knowledge, attitudinal factors and outcome expectations.

The self-efficacy construct has been used repeatedly to study students, teachers and schools efficacy (Bandura, 2000k). It fits well with the learner-centered approach to teaching used in Rwanda.
2. Model

The HIV counseling self-efficacy prediction model we used is shown in Figure 1.

![Diagram of HIV Counseling Self-efficacy Prediction Model]

**Figure 1.** HIV Counseling Self-efficacy Prediction Model

3. Design

This was a two phase study, both qualitative and quantitative.

B. Qualitative Research

The first phase of the study was an original qualitative research design. Its purpose was to elicit culturally relevant responses regarding the domains specific to the research questions. The key informant questionnaire addressed values, social influences and self-regulation processes among nursing students in Rwanda. Bandura (2001) states that to develop an efficacy scale, one must first find out what motivates or triggers people to a certain action and "what makes it hard for them to perform the required activities regularly." The qualitative research helped contextualize the operationalization of the
variables. Existing data shows that beliefs about condoms, for example, vary across sub-Saharan African countries. It was important to uncover the salient ones in Rwanda. These findings facilitated the design of a culturally relevant close-ended questionnaire using terms generally understood by Rwandan nursing students and describing accurately the variables under study. Another aim was to assess the appropriateness of the intended questionnaire design, such as the use of a Likert scale. This part of the study was inductive, based on grounded theory methods. It was conducted in two nursing schools in Rwanda. The two schools from which students and teachers were chosen were from different settings. Interviews started in a rural privately funded nursing school and were completed in an urban publicly funded school. There were a total of 78 male and 77 female students enrolled in the study.

Schools participating in the qualitative study did not participate in the quantitative part of the study to reduce contamination threat. The nursing school directors helped the investigator to select respondents and provided time for students and teachers to participate in the interviews and focus groups. The qualitative study was conducted by a non Rwandese, to make room for disclosure. It was conducted in French as this is the language used in secondary school settings.

1. Key Informant Interviews

For the interviews, the directors of the nursing school provided a small office insuring privacy. They provided limited information about the students under their supervision such as age, gender, type of lodging and grade level to promote adequate theoretical sampling. No record of name or address of the interviewees was kept.
Confidentiality was further assured by only one non-national investigator conducting all the interviews. Professional books were provided as incentives for the participating students. To reach saturation, using theoretical sampling guided by the research questions, eight female and seven male students were selected for key informant interviews. To allow for triangulation, five nurses and five nursing practice instructors were also interviewed. Before each interview, the interviewee received written and oral explanations about the procedure and its confidentiality and signed the consent form to indicate his/her agreement. The key informant was informed that he/she could refuse to answer any question he/she didn’t feel comfortable with or even discontinue the interview at any time.

The interviewer used the key informant guide for the content of the interview. She addressed the issues in a semi-directive way. She was attentive to possible interviewer bias and refrained from inducing answers. The interviews were taped and then transcribed. Immediately after each interview, the investigator wrote an observation report about the setting, the body language of the interviewee and herself and her feelings and decisions, where necessary.

Results were confirmed by observation of working environment in seven clinics and one hospital, information gathered during a focus group and training session with nurses in Rwanda as well as feedback of leading health professionals in Rwanda.

2. Data Analysis

Collected data was analyzed using grounded theory as delineated by Strauss and Corbin (1998). Salient words, phrases and expressions emerged from line by
line scanning of first transcripts. Relevant text blocks situated in context were underlined in following interviews. Possible meanings of words, phrases, and expressions were explored and listed by using structural, temporal, spatial, theoretical and practical questions. Objects and concepts were compared for similarities and differences. Emerging concepts were filed in categories and sub-categories. For each category, general characteristics were listed as properties. Variations of properties under different conditions formed dimensions. Categories were completed with each additional interview until theoretical saturation. Relationships between concepts under varying conditions were uncovered and provided provisional hypotheses. This process began with coding. Through further investigation first ideas were refined, invalidated or confirmed and new unexpected emergent concepts were identified. Tools used were: literature, observations, interviews, focus groups, an open-ended questionnaire which evolved according to theoretical sampling, field notes, memos and diagrams. This process allowed interviewees’ interpretation of events to be expressed while allowing for interplay between data and investigator’s prior knowledge of subject.

C. Quantitative research

1. Design

This was a pilot study using a cross-sectional, observational design.

2. Subject Population

We recruited 203 level two nursing students from two accredited nursing schools in Rwanda. Nursing students begin their nursing program in their fourth year of high school. In this study, students entering the nursing program are called 1st year
students and students exiting the program, 3\textsuperscript{rd} year students. To be included, students needed to be 18 years or older. They were enrolled in 2\textsuperscript{nd} or 3\textsuperscript{rd} year of nursing training to allow for a good command of the languages of higher education, which can be French or English, Kinyarwanda being the language of primary education. Exclusion criteria included student enrolled in 1\textsuperscript{st} year of nursing training and being less than 18 years old.

3. Measures

For all measures of the quantitative questionnaire, we tried to use whole or partial existing questionnaires, adding questions based on the qualitative study. Due to the scarcity of culturally contextualized scales, scales tested for reliability in the US were used for measures. Additional items from other relevant and validated questionnaires guided the writing of qualitative and quantitative questions. We choose the following variables, as shown in Table III-1.

a. Dependent Variable. An HIV counseling self-efficacy scale was the dependent variable. All questions began with “I am able to.” A score was computed by adding values of items scaled from 1 to 10 and dividing the sum by the number of items.

b. Independent Variables. Demographics. Demographics were assessed through ten items: school year, gender, birth year, marital status living arrangements while studying, home location, father and mother’s occupation, father and mother’s education, and religious affiliation.

Knowledge. HIV knowledge was assessed through questions about HIV beliefs, transmission and prevention. Single item indicators were used to measure sexual risk prevention knowledge and mother to child HIV transmission knowledge. The HIV
transmission score was obtained based on the number of correct responses to three questions. Correct responses on the basis of current scientific knowledge were coded as ‘1’, and incorrect and ‘don’t know’ responses were coded as ‘0.’

**Attitudinal factors.** The motivation to nursing scale was derived from the qualitative study. For this scale and the attitudes toward sexual relationships scale, scores were obtained by adding and then dividing items scaled from one “not at all” to 10 “totally” through the number of items. A single item indicator was used to measure stigma (HIV-AIDS survey indicators database) on a scale of one “not at all” to four “much.”

**Enactive experience.** Enactive experience was assessed through having tested for HIV (CDC, 2001) measured as yes or no and the PLWHA care experience scale. This score was obtained by adding items measured as yes or no and dividing the sum by the number of items. The PLWHA care experience scale was derived from the qualitative study.

**Outcome expectations.** Single item indicators were used to measure professional risk expectation (Bluespruce, Dodge, Grothaus et al., 2001) and counseling expectation. Items were scaled from one “not at all” to 10 “totally.”

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<tr>
<th>Table 3.1. Scales Construction</th>
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<td><strong>Variables</strong></td>
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<td>HIV counseling Self-Efficacy*</td>
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<td>Transmission knowledge</td>
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<td>Trim, Adams &amp; Elliott, 2003. 7 items.</td>
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4. Questionnaire Development

The questionnaire was based on published instruments which were adapted according to the findings of the qualitative study. It consisted of demographic data, beliefs, factual knowledge, attitudinal factors enactive experience, expectations and self-efficacy questions regarding professional and sexual risk as well as HIV counseling.

The questionnaire was written in French and English as these are the languages used from secondary school onward. The questionnaire was aimed at a 6th year grade level and was proofread by selected teachers. To obtain the French questionnaire, questions were translated in French and then backtranslated by a different translator to insure consistent meaning and were then adapted to colloquial French in Rwanda.

The questionnaire was designed for completion during one 50 minute class period.
5. Power Analysis

We used all independent variables in the initial model and four of the demographics: school year, gender, profession of father, profession of mother and religious affiliation. Six variables were retained for the final model: religious affiliation, HIV transmission knowledge, sexual prevention knowledge, mother to child transmission knowledge, PLWHA care experience and counseling outcome expectations. Using G*power (Faul, F., 2008), for a power for multiple regression testing =.93, a small effect size =.15 and an α =.05, 138 participants were needed.

6. Pre-testing of the Questionnaire

The questionnaire was pre-tested on 12 students for clarity and completion time on a convenience sample of 1st year to 3rd year nursing students in the school in which the qualitative study took place. The appropriateness of the readability level was assessed. Questions that were not understood were rewritten. Internal validity was also assessed. Ambiguous terms were rewritten. Non-differentiating responses were eliminated. Internal consistency reliabilities were computed using Cronbach's alpha. Scales proved to be unreliable in Rwanda and were adapted to the context.

D. Ethical Issues

The guarantee of confidentiality for the information given by the students was the main ethical issue. A written consent form was given to each participant in the qualitative part of the study immediately prior to his or her participation (interviews, questionnaire respondents). Participants were verbally informed about the purpose of the study, the benefits and risks to them and the population as well as their rights. They were informed
that there would be no consequences if they decided not to participate in the study or to interrupt it after it had already started. Participants were given time to go through the form and those willing to participate were asked to sign. The same explanations were given for the respondents to the written questionnaire, however, the written explanations were in the cover letter which they signed to indicate their willingness to participate. The students were instructed to return the questionnaire blank if they didn’t want to participate. The procedure helped maintain a high level of confidentiality on this sensitive survey. It was difficult to discern a difference between respondents and non-respondents.

For interviews, no name was given for identification. The investigator made sure that a third party would not overhear the conversation. Unauthorized persons, including school authorities, teachers or other students did not have access to the content of the interviews. The investigator kept all tapes in a secluded place.

The questionnaire was anonymous. There was enough space between respondents to the questionnaire so that they were unable to see each other’s responses. After completion of the survey, the students put the questionnaire face down in a box that was collected by the principal investigator.

Separate debriefing for males and females was possible after the survey, but no student took advantage of it.
E. Data Analysis

1. Data Collection

The questionnaire was self-administered among nursing students in their classrooms. Only the investigators and the students remained in the classroom. The teachers were asked to leave the room while the students completed the questionnaire.

The students received information about the procedure, risks and benefits of the study. Each student received a questionnaire, a cover letter and an envelope. All students gave their active consent to participation in this study. Respondents received instructions about how to fill the questionnaire. They were instructed to measure their present capabilities and behaviors. The investigator showed how to use a scale. During the survey, investigators were available to students for questions on a one to one basis and in a quiet voice so as not to disturb others.

The assurance of confidentiality may have fostered participation. After completion of the survey, the students placed the questionnaire face down in a box. The principal investigator made sure no one else accessed the content of a questionnaire while in the participating schools. On their way out, students took with them a notebook and a pen as a material incentive to thank them for participating.

After the survey, a debriefing group was offered separately for males and females to dispel fears and orient individuals in need of private counseling related to possible exposure to the HIV virus or another issue triggered by the questionnaire. Students were provided with phone numbers to use if questions or problems were to arise at a later time. No student made use of any of these opportunities.
2. Data Analytic Process

With the assistance of a statistical package for analyzing social science research data (SPSS 15), the principal investigator double entered all collected questionnaires into a database for analysis. The data were cleaned and controlled for out of range variables and outliers using standard measures. Categorical variables were coded into groups and scaled where possible. Variables were examined for normality assumptions. In line with the research aims, data was analyzed as follows: Pearson chi-squares and likelihood ratios described categorical variables; mean standard deviation and independent t-tests described continuous variables; and median, range and Mann-Whitney U tests described non-parametric variables. Univariate regression was used for model building, as shown in Table III-2. Multiple linear regression analysis was used to examine relationships between outcome and independent variables.
Table 3.2. Model Building Strategy

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<th>Variable class</th>
<th>Variables in class</th>
<th>Variables significant from individual classes</th>
<th>Final Model</th>
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<td>School year</td>
<td>Religious affiliation</td>
<td>Religious affiliation HIV transmission Sexual prevention Mother to child transmission Cared for PLWHAs Counseling expectation</td>
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CHAPTER 4
FIRST PUBLISHABLE PAPER

HOW PREPARED TO HIV PREVENTION AND CARE ARE NURSING STUDENTS IN RWANDA?

AIDS Journal

Jacqueline Wosinski
Susanne Montgomery
Dynnette Hart
Naomi Modeste
HOW PREPARED TO HIV RISK PREVENTION AND CARE ARE NURSING STUDENTS IN RWANDA?

ABSTRACT

Background. The HIV epidemic remains a public health challenge in sub-Saharan Africa. The prevention of HIV is a central element of the epidemic's overall control. Success is tied to effective involvement of nurses at all levels of the HIV continuum of prevention and care in resource poor countries. Worldwide, nurses' preparedness is influenced by several factors, including knowledge, health beliefs, behaviors, barriers and self-efficacy.

Purpose of study. The study aimed at preparing nursing students in Rwanda to intervene along the HIV continuum of prevention and care.

Methods. We used mixed methods to explore preparedness of male and female nursing students in Rwanda for HIV risk prevention and care. We used a semi-structured key informant outline to explore overall knowledge of HIV risk prevention, knowledge, barriers, attitudes and self-efficacy regarding sexual prevention, condom use, needlestick injuries and care of PLWHA. Data were collected among 25 students, nurses and nursing instructors. Grounded theory guided data analyses. The development of relevant quantitative survey items was driven by the beliefs and understandings we identified. Once univariate data were collected, selected results were used to further explore qualitative findings.

Results. Three themes were identified as critical elements affecting nursing students' preparedness to HIV prevention and care:
1. Perceived professional risk in the context of stretched human and material resources
2. Lack of preparedness to sexual risk prevention education
3. Lack of psycho-social counseling preparation

These themes were associated with the lack of cognitive preparedness to prevention and care, stigmatization and the lack of emotional preparedness to prevention and care among nursing students in Rwanda which contributed to a lack of readiness to participate in HIV prevention and care activities.

**Conclusion**

The lack of contextualized nursing training and culturally embedded discussion of personal and professional health beliefs with nursing teachers impaired nursing students’ acquisition of professional HIV prevention knowledge, dispelling fears and stigmatizing attitudes regarding PLWHA and efficient counseling with clients among nursing students in Rwanda. It negatively affected their level of preparedness for HIV prevention and care.

**INTRODUCTION**

**Background.** AIDS remains the leading cause of death in sub-Saharan Africa and HIV risk prevention, given the lack of an effective vaccine, a central element of the epidemic's overall control. In 2007, the low estimate HIV prevalence rate among adults, ages 15 to 49, in Rwanda was 2.4 percent (UNAIDS/WHO, 2008). According to a World Bank report (Genderstats, 2008), 21,000 people died of AIDS in 2007. While antiretroviral therapy (ART) scaling up is well underway in Rwanda, 50% of PLWHA didn’t yet have access to treatment. The incidence of HIV varies from 12% in the capital city Kigali to 2.2% in rural areas. HIV incidence among young women (ages 15-24) was
twice that of young men in the same age group. Seventy five percent of HIV incidence in Rwanda (HIV/AIDS National Care and Treatment Plan 2003-2007) is attributed to heterosexual contact and 25% to mother to child transmission. survival sex, a staggering number of orphans vulnerable to sexual abuse, low access to condoms as well as sexual practices including multiple and overlapping sexual partners and older males having sex with teenage or young adult girls contribute to the epidemic. Factors known to reduce the pandemic are sexual practices behavior change, empowering women, voluntary counseling and testing (VCT), ART, PLWHA care as well as measures building knowledge, skills and self-efficacy (Agyei-Mensah, 2005; Practical Guidelines for Intensifying HIV Prevention, 2007). According to the 2005 demographic survey (Demographic and Health Surveys [DHS] Final Report, 2006), more than 50% of males and females ages 15-24 could correctly identify ways to prevent HIV and reject misconceptions about HIV transmission. However, how this knowledge affects behavior is unclear. In the same study, 13.2% of males and 3.9% of females reported having had sexual intercourse, of which only 44% of males and 22% of females declared using condoms (Kayirangwa, Hanson, Munyakazi, & Kabeja, 2006). Although life skills-based HIV education is being implemented in some schools (Kabanyana-Zigira, Rutayisire, Muvunyi & Sebaruma, 2005), its extent was not reported (DHS Final Report, 2006).

**Health sector.** Success in controlling the epidemic is tied to effective involvement of nurses at all levels of the HIV continuum of prevention and care in resource poor countries. In 2005, 30% of healthcare positions in Rwanda were not filled. The number of health workers in Rwanda was well below requirements for Sub-Saharan Africa as defined by the WHO (Health Strategic Plan, 2005). Nurses implement most prevention
and care measures in rural Rwanda. A2 nurses, trained for three years after three years of high school education, frequently run clinics, diagnosing and treating most of the patients and overseeing community health workers. In 2005, only 56% of health workers, mainly A2 nurses, were assigned to rural areas. Yet, they carried 80% of the burden of care (Human Resources for Health Strategic Plan, 2006).

In Rwanda, many health centers have limited access to water and electricity and lack equipment and supplies. Nurses have access to disposable syringes and needles, at least in main hospitals. They also may use a needles disposer. Single use gloves are less available and may be washed for further use (Rwanda Country Report, 2008). The situation in rural clinics is unclear; however Faye (2001) has described an overall shortage of supplies, including single use equipment, scarcity of complete and safe disposal systems and prevalence of sterilization by boiling equipment.

Universal precautions include personnel protective equipment and interventions. Actual cases of occupational HIV transmission are linked solely to blood contamination. Needlestick injuries, occurring mostly during intravenous procedures and penetration of sharp objects, account for 80% of blood exposure incidents (Nsubuga & Jaakkola, 2005). They are mainly linked to two handed needle recapping. Injection safety includes no harm to recipient, injection giver or visitor (Cutter & Gammon, 2007). The level of preparedness to quality of care defined as safety, effectiveness, patient centeredness, and timeliness (Agency for Health Care Research and Quality, 2006) among Rwandan nursing students is unclear.

Dealing with psychosocial factors in areas such as palliative care and counseling has become a crucial component of HIV prevention and care. Worldwide, nurses'
preparedness is influenced by factors such as knowledge, health beliefs, behaviors, barriers and self-efficacy (Uys, 2003; Oyeyemi, Oyeyemi & Bello, 2006). Thus the question arises how Rwandan nursing students’ personal backgrounds and belief systems impact how they integrate care and how they are prepared to clarify their own values and attitudes before counseling with patients.

As nursing students enter the field of nursing science, they are aware of the potential health risks they will be facing. There is no indication that nurses have a lower incidence of sexually transmitted HIV. In addition, they are exposed to HIV in their work, especially since universal precautions are known to be implemented to varying degrees at best. Whether nursing schools prepare students to effectively manage their sexual and professional risks as well as boundaries and self care and thus proceed confidently in HIV prevention and care is unclear.

**Conclusion.** Nurses are expected to intervene at all levels of the HIV continuum of care. Whether nursing students are effectively prepared to take up this challenge is unclear. Many questions regarding nursing students’ ability to engage in HIV prevention and care remain unanswered.

This study explores how culture, training and environmental determinants of care shape nursing students’ personal and professional behaviors regarding HIV prevention and care. We used a qualitative method research approach to investigate these issues. Identifying beliefs and better understanding how care was given helped develop items for a quantitative survey. Once data was collected, selected univariate results were used to further explore qualitative findings.
METHODOLOGY

Study design. A mixed-methods study was conducted to investigate knowledge, beliefs, attitudes, behavior, self-efficacy and barriers regarding HIV preventive behaviors and care for PLWHA in a convenience sample of male and female nursing students in Rwanda. Since little is known about HIV risk prevention and care among nursing students in Rwanda, we utilized a two phased exploratory approach: Data were collected and analyzed in Phase I, then used to develop the phase II quantitative survey, a 125-question self-administered questionnaire.

The study was conducted between July 2004 and March 2005 in four secondary school level nursing schools, one training hospital and two training clinics in three regions of Rwanda. The study was approved by the Loma Linda University Institutional Review Board and authorized by the Ministry of Health in Rwanda. Participants signed informed consent forms before interviews. A culturally competent foreign interviewer interviewed the participants. All interviews were conducted in French at seven rural and urban schools and health centers.

Sample. Eligibility selection criteria included being a nursing student at least 18 years old, a nurse in charge of students or a nursing teacher in Rwanda.

Qualitative data collection. Phase I consisted of qualitative data collection around HIV risk and care issues. To assure triangulation, 25 key informant interviews with nursing students, practicing nurses and nursing teachers (Table 1) were conducted using a semi-structured key informant outline to help guide the discussion.

This key informant guide was based on existing literature and health behavior theory and explored knowledge, attitudes, self-efficacy and barriers around four
behaviors: needlestick injuries, HIV+ patient care, sexual relationships and condom use as well as knowledge on HIV transmission, prevention and treatment. In line with standard grounded theory methods (Strauss & Corbin, 1998), the guide evolved as saturation on a topic was reached. All participants were interviewed in a private office. Confidentiality was stressed as part of the informed consent procedure. Each participant received a nursing textbook as an incentive. Interviews were audio-recorded if the respondent agreed. For two of the informants who declined the taping, notes were taken during the interviews and completed afterwards. Interviews were transcribed verbatim to allow in-depth qualitative analysis. Field observations were also included in the analysis.

**Qualitative data analysis.** Our final qualitative data set consisted of 25 transcripts (Table 1) as well as of field notes. Grounded theory methods were used to analyze the resulting data. In a code book, the researcher documented the process of organizing emergent data embedded in participants’ views into a meaningful pattern.

Quantitative data collected among 2nd and 3rd year nursing students were entered and analyzed using predictive analytics software technology (SPSS 15). For this paper, descriptive frequencies and means of 3rd year nursing students’ responses to questions matching our qualitative themes were selected to explore if our qualitative findings were validated in the quantitative phase of the study.

RESULTS

*Table 4.1. Qualitative Study Demographics (N=25)*

<table>
<thead>
<tr>
<th>Gender</th>
<th>Male</th>
<th>2</th>
<th>3</th>
<th>2</th>
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<th>1</th>
<th>3</th>
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<tbody>
<tr>
<td>Female</td>
<td></td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Place of origin</td>
<td>Rural</td>
<td>5</td>
<td>4</td>
<td>-</td>
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<td></td>
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<td></td>
<td>2</td>
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</tr>
<tr>
<td>Living quarters</td>
<td>Dormitory</td>
<td>5</td>
<td>6</td>
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<tr>
<td></td>
<td>Family</td>
<td>-</td>
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<td>2</td>
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<td>-</td>
</tr>
<tr>
<td>Age</td>
<td>18-24</td>
<td>18-23</td>
<td>19-30</td>
<td>-</td>
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</tr>
</tbody>
</table>
Context of Entry Level Nursing Students

Before exploring the three major emerging themes, it is critical to understand the context of nursing students in Rwanda for the purpose of our research.

Physicians and highly trained nurses tend to concentrate in Rwanda’s urban areas. As a result, A2 level nurses run Rwanda’s clinics. While isolated in rural areas, they are at the forefront of the primary healthcare system.

As A2 students enter nursing school, they have preconceptions of HIV and related topics that may impact their professional attitudes. Students have acquired knowledge, beliefs and values regarding HIV in their home and through national prevention campaigns. In families, it appears to be the father’s role to pass on values about sexual conduct and information about sexual risks to the children, male or female, but the mother can fulfill that role if the father is absent. Radio broadcasts, attendance of theater plays targeting youth, and neighbors and friends are other often named sources of information. A third of the students report having helped care for a relative afflicted with AIDS.

Although the need for education is valued in Rwanda as a necessary step toward better living conditions, nursing studies at the secondary school level are not prestigious. “They give us bizarre names. In this school, they call us ninjas... They say we come from the countryside, have little knowledge and do this because we weren’t accepted anywhere else (male 3rd Y st.).”

In our study, reasons for choosing nursing studies are: family influence, hope of later attending medical school, lack of other options, desire to serve the community and help one’s family. This last motivation was more often cited by females.
It is in this context that students enter nursing school. In our analysis, we identified three themes as critical elements affecting nursing students' preparedness to HIV prevention and care: perceived professional risk in the context of stretched human and material resources, a lack of preparedness to sexual risk prevention education and a lack of psychosocial counseling preparation.

Theme 1: Perceived professional risk in the context of stretched human and material resources

Students perceived their risk being infected with HIV while working as higher than practicing nurses we interviewed. Seriousness of being diagnosed with HIV was considered as very high in the context of no cure. However, students did not seem to realize that each patient could potentially be HIV+ and tended to express concern only around caring for those identified as PLWHA. Furthermore, students had difficulties distinguishing innocuous procedures such as bathing a patient from the more serious tasks such as drawing blood (Table IV-2).

Needlestick injuries

Although needlestick injury is the main source of HIV contamination and preventive ART treatment among nurses, most students could not accurately describe the whole procedure to discard a needle after injection (43.3% among respondents of the quantitative study). Students practicing in a hospital delivering ART treatment tended to describe a more accurate procedure for secondary prevention of needlestick injuries. Nursing students expressed concern regarding the possible deadly consequences of needlestick injuries as opposed to working nurses who seemed to accept this as part of the realities of their chosen profession: “Of course I get pricked. It is part of my job (Male
Procedures to reduce environmental risks for themselves and students were unequally and incompletely described. As confirmed by field observations, managing equipment disposal, particularly needle recapping, induced most contamination risks. Respondents frequently associated departure from standard procedures with lack of awareness and poverty. However, nurses and students alike reported adhering to Rwanda’s policy about restricting injection equipment to single patients. Patients were said to be well informed of this policy through radio programs.

Glove use

Students thought that gloves would protect them in a context where the availability of gloves is problematic. Students felt secure caring for PLWHA if they wore gloves. They accurately mentioned the need to resort to double gloving for more risky procedure such as suturing. Most students cited gloves as the only means to avoid HIV contamination, although cutting skin across gloves is not infrequent. Moreover, in many health institutions, we observed that gloves were available in only very limited supply and their use restricted to surgery and deliveries. Consumption of this highly valued equipment was a source of tension between nursing students and nurses. “In somewhat poor hospitals, there is no equipment, as it is the patient who must pay for gloves. But we are the students and when we use them, they say that we waste them (F. 2nd Y. st.).”

Students seemed unequipped to contextualize glove use in an environment of equipment scarcity, discuss appropriate alternatives or deal with contamination fears.

Universal precautions

Almost all interviewees did not understand the term universal precautions and did not know where to find written procedures. Field observation confirmed the statements
even as posters describing opportunistic diseases treatment or HIV counseling procedures could be seen in clinics. Moreover, compliance with procedures was perceived as low. Yet, it was assumed that nurses knew about standard precautions and would be able to model safe practice to students. “Nurses are supposed to know. They are supposed to have learned this when they got their nursing training. They get training on HIV care, not universal precautions (Male nurse).”

As a result, nursing students and students alike were largely unable to accurately assess HIV contamination risks to patients, visitors or staff in the healthcare institutions where they were active.

**Table 4.2. Selected Results to Professional Risk in the Context of Stretched Human and Material Resources**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Qualitative results</th>
<th>Quantitative results for knowledge of 3rd year students (n=93)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and professional risk</td>
<td>Frankly, the rules are not published so that we can find them anywhere and read these rules (M nurse)</td>
<td>Discarding needles without recapping (yes) 56.7%</td>
</tr>
<tr>
<td></td>
<td>I must put the needle in its cap, but cautiously so that I don’t get pricked with the needle (M. 3rd y. st.).</td>
<td>Single use needles (yes) 82.2%</td>
</tr>
<tr>
<td></td>
<td>You too if you don’t wear gloves, you can get this illness. But when we do care, we use gloves so that we don’t get this illness (F 1st y. st.)</td>
<td>Gloves for all procedures with PLWH (no) 6%</td>
</tr>
</tbody>
</table>

**Theme 2: Lack of preparedness to sexual risk prevention education**

Interviewees pointed out challenges to sexual risk prevention education (Table 3) that need to be addressed to prepare nursing students to this role.

**Health beliefs**

Nursing students had to confront beliefs held in the community with their newly acquired medical knowledge. They reported that imprecise anatomical conceptions leading to the belief that condoms could be lost in the vagina were held in the
community. Condoms were regarded as unsafe as they could potentially have a hole or rupture. They were also thought of as a barrier to pleasure—"one doesn't eat a sweet with its wrapping (F 2nd y. st.)."

Students also had to face cultural values and norms, at times hindering best practices, such as condom use negotiation or fighting prejudice towards members of the community choosing risky behaviors.

In the population, it is thought that the woman shouldn't go with certain men, not work with her sex. She must look for all means not to do it. Sometimes, wandering occurs not because there is no ways to work, but because one is... of seeing that one doesn't want to work (female 1st Y st.).

Although trade sex was widely perceived as a result of poverty, all respondents felt that everyone had a choice, be it the one of poverty and that one had look for other hypothetical options, such as soliciting overstretched family members.

HIV prevention among females

During their health education training, students related exposure to inconsistent health education practices targeting mostly women.

When we give health education, we say that the wife must require this from her husband, her partner and that it is the woman that must, I don't know that must place the condom. But how they behave in this thing, I don't know (M. nursing teacher).
All interviewees felt that in the community, condom use was associated with sexual promiscuity. They stated that it made it very difficult to negotiate safe sex, especially for females, as they would be accused of unfaithfulness. Although this difficulty to negotiate safe sex was widely acknowledged, these women didn’t receive skills training to be able to follow through with the advice. No respondent seemed to have heard of or themselves received negotiation skills training.

*Promoting safe sex*

Most students (68% among respondents of the quantitative study) declared choosing abstinence. The main motivations were: religious conviction, safest method to avoid HIV infection and part of a career plan for females. However, not all schools were said to provide open HIV prevention information for students. Discussions about sex with teenagers was perceived as inadequate and kept to a legal minimum. Some health care institutions seemed to have equally unclear HIV prevention guidelines. Depending on values held in the institutions, interviewees mentioned that condoms were available for demonstration during health education, but not for sale at the institution’s pharmacy, sending students mixed messages.

*At our hospital I don’t know. We find them only when we make a demonstration; one can give us a condom. Do they have large quantities, I don’t know. How they give it to the population, I don’t know. I don’t know if they sell any. If they sell them, I am not aware of it (Male nursing teacher).*
Students were more conservative in their values statements than nursing practice teachers who expressed less judgmental attitudes and were more focused on effective care and prevention. However, students, nurses and institution leadership seemed to be at loss with their ethical dilemmas and conflicted about health professionals’ role in HIV prevention. Several issues pointing to the need for counseling preparation were uncovered (Table 4).

**Table 4.3 Selected Results to Sexual Risk Prevention Education**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Qualitative results</th>
<th>Quantitative results for behavior and attitudes of 3rd year students (N=74)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beliefs, values and sexual risk</td>
<td>MY FATHER... HE TOLD ME THAT IT IS AN ILLNESS THAT HAS CAUGHT MANY PEOPLE... HE GIVES ME THE COUNSEL OF ABSTINENCE. (2ND Y. F ST.)</td>
<td>Abstinence (yes) 68%</td>
</tr>
<tr>
<td></td>
<td>AIDS is shameful because we know that in a majority of cases, it is transmitted through sexual intercourse... It is shameful because people will see that you have been wandering (3rd y. M st.)</td>
<td>PLWH who are sick because of their sexual behavior have their just reward (no) 58.2%</td>
</tr>
</tbody>
</table>

**Theme 3: Lack of preparedness to psycho-social counseling**

**Stigma**

Sexual norms seemed to induce a judgmental attitude toward people who practice sexual “vagrancy.” Attitudes toward PLWHA, however, seemed to be mitigated by two factors. Students named fear of contamination as the main reason for avoiding contact with PLWHA before undertaking nursing training. But students who had helped care for a close HIV+ family member state they felt comfortable caring for PLWHA.
Several students expressed shock at the harsh way patients were treated in some clinics. In the light of field practice experiences, they viewed the community as being wary of nurses.

Respondents also expressed a sense of loss from the part of the community when a young adult was diagnosed with HIV.

*Adults who have AIDS, they are people who, of which we expected already a certain return for society, they are people who should perform a service for society. Well, when he has become a PLWH, there is one resource less. And well, it is regrettable* (Male nursing teacher).

Yet respondents perceived nurses’ role as that of encouraging PLWHA inclusion in the community, to foster hope and self-esteem as well as stress their opportunity for healthy productive lives, particularly in the context of ART treatment.

*HIV transmission counseling*

Students cited HIV transmission modes quite accurately, at times so extensively as to include rare modes.

*To reduce AIDS, there are other things that people don’t know. When there are very deep kisses, when there is a wound in the mouth and the other also is wounded in that place and that of these two people one has it, he can contaminate others* (Male 2nd y. st.).
Concomitantly, although one nurse acknowledged it verbally, quantitative results indicated that 22.4% of 3rd year students were not sure insects cannot transmit HIV and 19.9% didn’t exclude the possibility of becoming infected with HIV through witchcraft. Some teachers worked with the students on their beliefs.

*We had to break this kind of myth that if you talk with a PLWA, or one who is HIV+, one can be contaminated, when we eat together, when there are mosquitoes that are with you at home, well we tried to push this aside (M. nursing teacher).*

*Counseling methods*

In some counseling centers, students were barred from access to counseling sessions, because of confidentiality issues. Nurses becoming HIV counselors were trained in current best practices regarding HIV prevention, but not nursing teachers who felt they could not adequately prepare students for HIV prevention and care.

Students received classes in ethics and health education. However, when describing their counseling sessions with PLWH, students seemed to lack professional skills. When talking with PLWA, students seemed to be most comfortable advising them to pray. "*We tell him not to worry, that he can live with AIDS. But I advise him to pray much and when he has reached, when the light, he will go to heaven (F. 1st y st.).*"

They could not explain how they would assist patients in dealing with their emotions, such as shame related to not having complied with prevention principles promoted by the media. A need for teaching counseling in further stages of AIDS was identified. Students didn’t receive training to deal with their own emotions in regard to
announcing an HIV positive diagnosis to a patient; neither were they prepared to care for chronically ill PLWA who would get weaker and weaker despite healthcare workers efforts and ultimately die. Respondents expressed their distress as professionals trained to help their patients get well. They also expressed progressive loss of motivation in caring for chronically ill patients in a context of professional risk. They might not have seen this activity as part of their professional role.

Finally, private and professional lives were intertwined in rural settings. Nurses had difficulties in maintaining a professional attitude.

"Sometimes I am the only person in the area who knows that he is HIV+. So when the person has a problem, he comes to my door at home and asks for help. It is at time overwhelming, so I have devised a monthly budget for these cases (Male nurse)."

However, nurses and nursing students did not receive training in setting healthy boundaries, stress management or self-care.

**Table 4.4 Selected Results to Psycho-Social and Spiritual Counseling**

<table>
<thead>
<tr>
<th>Themes</th>
<th>Qualitative results</th>
<th>Quantitative results for Knowledge and attitudes toward PLWH of 3rd year students (N=94)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before coming to school, I didn't want to greet them. I was afraid I could get AIDS. When I saw them, I didn't event want to share food with them. But now, I know the solution (M 1st y. st)</td>
<td>If a member of your family became sick with the AIDS virus, would you be willing to care for him or her in your household (yes)? 79.2%</td>
</tr>
<tr>
<td>Psycho-social and spiritual counseling</td>
<td>He says that when we pray, that is it, AIDS is gone (M. nurse)</td>
<td>Witchcraft causes HIV (no) 90.9%</td>
</tr>
<tr>
<td></td>
<td>Infected by mosquitoes: No, nobody can think that (3rd y. F st.)</td>
<td>Insects transmit HIV (no) 87.6%</td>
</tr>
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<td></td>
<td>If ART isn't effective, it will hinder the staff, because then we have patients that are permanent for a trimester, a semester, a year, so sometimes it bothers too. So, as we say that monotony is the enemy of evolution, it is found that may be the effort on the patient isn't the same when we have tried several times so that he can recover and the nurse, the care provider is a bit discouraged, even if he doesn't express it, he is tired (M, nursing instructor).</td>
<td>Attended PLWH (yes) 76.8%</td>
</tr>
</tbody>
</table>
DISCUSSION

As Rwanda is transitioning from a high school nursing degree to undergraduate nursing, the question of whether nursing students have, so far, been prepared to take a leading part in HIV prevention and care and how they might be better prepared is critical. We have blended the three themes as they emerged from the data as well as the context of entry level nursing students in Rwanda in three discussion issues: (a) lack of cognitive preparedness to prevention and care, (b) stigmatization of PLWHA and (c) lack of emotional preparedness regarding prevention and care.

The context of entry level nursing students permeates all three issues. Space should be made for nursing students to cognitively integrate scientific knowledge with HIV information received in their community. Experience with HIV in the family circle does positively change students’ perception of PLWH. Encounters with PLWH should be fostered among nursing students. Negative appraisal of nursing students by students of other disciplines weakens the emotional resources needed for prevention and care.

**Cognitive Lack of Preparedness**

Leonard (2001) identified prejudice, bias, stereotyping, and differences in perceptions and expectations as barriers to cultural competence. "Health care providers may not appreciate the effect of culture on their own lives, their professional conduct or the lives of their patients" (Gilbert & Puebla-Fortier, 2003). Students didn’t receive training enabling them to bridge potential gaps between the Rwandan world view regarding HIV health beliefs, such as illness occurring through witchcraft (Konrfield, Babalola, Awasum & Quenum-Renaud, 2002), and the western medical education paradigm.

**Stigmatization**

Perceived threat and seriousness of contracting HIV professionally is high among nursing students around the world (Durkin, 2004) and a deterrent to the care of PLWHA. In Rwanda, this problem is magnified by difficulties in mastering contextualized universal precautions. According to Uwakwe (2000), social cognitive-based skills training affects behavior change and task mastery, yet the exposure to nursing practice varied considerably among students. While some students did receive task specific skills training, others were asked to rely mainly on cognitive processes including memorization.

Stigmatization of PLWH has been described as a social process linked to factors such as sexuality, gender, class or fear, all of which have been elicited in our study. In line with Parker and Aggleton (2003), respondents explained how an HIV diagnosis affected the whole family and community. The economic burden of HIV on Rwanda has been well described: diversion of resources for treatment, loss of trained professionals, and a high number of orphans (Sekabaraga, Nizeyimana, Diop & Soucat, 2005). Respondents perceived PLWH as betraying the hopes of the community that they would contribute to its wellbeing. This concept echoes in the words of Esposito (2001) who affirms that community must be defined as a debt, something to which each member contributes. Thus, a positive cultural aspect may, in the context of HIV, lead to negative appraisal and neglect of PLWHA.
Nursing students expressed the condemnation, prevalent in Rwandan society, of sexual promiscuity. Rwandan values regarding sexual activity seemed to significantly protect nursing students from sexual risk (United Nations General Assembly Special Session [UNGASS], 2008), but the same values could be detrimental to a caring attitude toward PLWHA. To promote integration of community ethics and professional attitude among nursing students, they should have opportunities to discuss representations and clarify values during their training.

**Emotional lack of preparedness**

When exiting nursing school, the selected nursing student population found employment mainly in rural clinics. There, they prescribed treatment, but without the physician’s expertise or support, in underequipped and isolated settings and at risk of facing distrust from the community. Lack of protective equipment, contextualized procedures, secondary prevention of needlestick injuries and emphasis on universal precautions training among students, nurses and nursing instructors fostered a fatalistic and despondent attitude. Traditionally healthcare training in Rwanda has emphasized treatment and positive patient outcomes. The students were ill prepared to care for chronically ill patients with no hope of cure, facing a high death rate among those entrusted to their care. In Rwanda, patients were often too poor to pay for optimum care. They had to provide their own equipment such as syringes. Healthcare insurance was in its infancy. The nurse was thus confronted with difficult ethical choices such as choosing between risky procedures or denying treatment. In rural settings, private and professional life are so intricately linked that nurses were faced with making private as well as professional choices regarding PLWHA assistance. AIDS remains a chronic deadly
disease for those who don’t receive ART. However, nursing students received no training in coping skills (Gueritault-Chalvin, Kalichman & Peterson, 2000), emotional and professional boundaries management (Bennet, Miller & Ross, 1995) or end of life counseling that would enable them to address these issues as professionals. Providing tools to resolve ethical dilemmas and manage self-care would foster positive participation of nursing students in HIV prevention and care.

Conclusion

Exiting nursing students will carry the burden of care in Rwanda, but face tremendous environmental and human resources barriers. Nursing education in Rwanda is transitioning toward an undergraduate degree. Uncovering the nature of challenging issues is crucial in this context. Gaps in education have been identified. Nursing education poorly addresses knowledge and contextualization of HIV issues. Nursing students have not worked through emotional issues and are cognitively not sufficiently prepared. Program implementation designed in close collaboration with stakeholders should proceed from a thorough environmental and socio-cultural exploration. A pilot program could include: HIV prevention and care core skills as identified by best practices; health behavior change practice; training in contextualizing concepts and protocols; workshops in ethics and counseling; and managing boundaries. A research design would measure gains in preparedness to HIV prevention and care among nursing students and in a longitudinal perspective, effectiveness among community nurses.
REFERENCES


SPSS, Version 15. SPSS Inc., Chicago, Ill.


CHAPTER 5
SECOND PUBLISHABLE PAPER

PREDICTORS OF COUNSELING SELF-EFFICACY AMONG NURSING STUDENTS IN RWANDA

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Jerry Lee
Naomi Modeste

15 September 2008
Abstract

In this study we explore and compare HIV knowledge, attitudes, experience, expectations and their relationship to counseling self-efficacy between 2nd and 3rd year nursing students (N=203) in Rwanda. At the end of 3rd year, students enter the healthcare workforce. In Rwanda, 3.1% of the population was HIV+ in 2006. There is a shortage of qualified health professionals. Nurses with a high school-level education (A2) nurses run the clinics in rural communities and are at the forefront of HIV prevention. Little has been written on counseling self-efficacy building among nurses and nursing students. However, stigma, values, motivation and expectations may mediate sources of self-efficacy such as knowledge and enactive mastery. In this cross-sectional study, respondents completed an anonymous, self-administered questionnaire. T-tests and chi-squares revealed that 3rd year students have insufficient HIV transmission and prevention knowledge and have built only a moderate level of counseling self-efficacy. They report a lower degree of stigmatization and higher counseling expectations than 2nd year students. Third year students also report more experience with PLWHA care, although 13% of them not having provided care for a PLWHA. For all students, multiple regression analysis reveals that religious affiliation, knowledge and PLWHA care experience significantly predict counseling self-efficacy.

Results partially confirm the self-efficacy construct. They also point to the need to integrate sources of self-efficacy in nursing teaching in Rwanda.

Introduction

Rwanda is one of the ten countries hardest hit by the HIV epidemic. In 2006, the HIV low estimate prevalence rate among adults, ages 15 to 49, was 2.4 percent
HIV incidence among young women (ages 15-24) was twice that of young men in the same age group. While ART scaling up was well underway in Rwanda, 50% of PLWH didn’t yet have access to treatment. The HIV incidence rate has seemingly decreased in recent years (United Nations General Assembly Special Session [UNGASS], 2008).

Seventy five per cent of the HIV incidence in Rwanda is attributed to heterosexual contact, and 25% to mother to child transmission. Major factors contributing to the pandemic in Rwanda are socio-economic factors such as survival sex, the socio-cultural status of women, a staggering number of orphans and other children vulnerable to sexual abuse, barriers to condoms accessibility as well as sexual practices including multiple and overlapping sexual partners and older males having sex with teenage or young adult girls (AIDS National Care and Treatment Plan 2003-2007, 2003).

Counseling has become a major issue along the HIV continuum of care (Uys, 2003) and may include: advice on HIV transmission prevention; ensuring that the patient understands information; helping patients to cope with emotions; encouraging disclosure in a safe, enabling environment; and adapting to different patient groups and epidemic levels (Guidance on Provider-Initiated HIV Testing and Counseling in Health Facilities, 2007).

The genocide led to the loss of many educated people. Rwanda faces a shortage of professionals, particularly in rural areas, where in 2005, 80% of health care was delivered by 56% of the Rwandan healthcare workforce. There were less than 200 generalist physicians employed by the Ministry of Health. A2 nurses, trained for three years after three years of high school education, overwhelmingly staffed rural health centers (Human
Resources for Health Strategic Plan 2006-2010, 2006). They performed all the duties of community health nurses (Keller, 2004), but their tasks could also include managing clinics, diagnosing and treating patients and overseeing community health workers. Nurses are at the forefront of awareness rising about voluntary counseling and testing (VCT) in the community.

Counselors in Zimbabwe felt they were insufficiently trained and found counseling to be challenging (Richards & Marquez, 2005). HIV-related self-efficacy research has focused mostly on beneficiaries and little is known about counseling self-efficacy building among nurses and nursing students. Self-efficacy, a good determinant of behavior, refers to "beliefs in one’s capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1977a). It is both a predictive and intervention construct. Factual knowledge would be sufficient only for cognitive problem solving. For nursing students, enactive mastery experience is an important source of counseling self-efficacy (Bandura, 2000a). However, nurses' preparedness and effectiveness may be mediated by other factors such as motivation, health beliefs, barriers, and attitudes (Oyeyemi, Oyeyemi & Bello, 2006; Kinsler, Wong, Sayles, Davis & Cunningham, 2007).

In a context of oral culture, the length of attention span and the ability to memorize facts are real assets. However, multidimensional information from media, the neighborhood and nursing instructors may lead to cognitive biases (Bandura, 2000b). Environmental barriers to positive enactive experience may confuse nursing students (Faye, 2001). Stigma among healthcare providers has been shown to be a barrier to vulnerable population care (Kinsler et al., 2007) and may impair self-efficacy. Outcome
expectations, defined as the expected personal and social outcomes of a behavior have been shown to influence self-efficacy (Bandura, 1977b).

Nursing students in Rwanda prepare to take a leading role in the fight against the epidemic. It is important to understand how knowledge, attitudes, experience, expectations and self-efficacy unfold during their years of training. As Rwanda is transitioning from a high school nursing degree to undergraduate nursing studies, building counseling self-efficacy alongside other skills will be central to effective HIV prevention.

The purpose of this study held among 2nd and 3rd year nursing students in Rwanda was twofold. One aim was to explore and compare HIV knowledge, attitudinal factors, enactive experience, outcome expectations and self-efficacy regarding HIV counseling among 2nd and 3rd year students. The second aim was to explore relationships between knowledge, attitudinal factors, enactive experience, outcome expectations and HIV counseling self-efficacy. For the purpose of this study, we used a cross-sectional observational design.

**Methods**

**PARTICIPANTS**

A convenience sample of 102 2nd year and 101 3rd year students aged 18 or more was recruited among students attending nursing schools in Rwanda. To ensure an adequate level of understanding in the language of secondary education, French or English, second and third year students were selected. Out of six classes in two schools, two 2nd year classes and two 3rd year classes answered the questionnaire in French and one class for each school year in English.
PROCEDURE

A 125-item questionnaire, based on published questionnaires and qualitative analysis was developed in English, translated in French and back-translated for consistent meaning. Contextualization was insured through close collaboration with health professionals in Rwanda. The questionnaire was pre-tested on 12 students for clarity and completion time among nursing students from a different school. The appropriateness of the readability level was assessed. Questions were rewritten according to results.

MEASURES

Due to the scarcity of culturally contextualized scales, we constructed two scales and applied US-validated scales that proved to be unreliable in Rwanda. Adaptation to the context based on the qualitative work and again during the scale construction phase based on reliability analyses (Table 1) led to a decrease in items.

Dependent Variable

HIV counseling self-efficacy was the dependent variable. All questions began with “I am able to.” A score was computed by adding values of items scaled from 1 to 10 and dividing the sum by the number of items.

Independent Variables

Sociodemographics. Demographics were assessed through ten items: school year, gender, birth year, marital status, living arrangements while studying, home location, father and mother’s occupation, father and mother’s education and religious affiliation.

Factual knowledge. HIV knowledge was assessed through questions about HIV beliefs, transmission and prevention. Single item indicators were used to measure sexual risk prevention knowledge and mother to child HIV transmission knowledge. The HIV
transmission score was obtained based on the number of correct responses to three questions. Correct responses on the basis of current scientific knowledge were coded as ‘1’, and incorrect and ‘don’t know’ responses were coded as ‘0.’

Attitudinal factors. The motivation to nursing scale was derived from the qualitative study. For this scale and the attitudes toward sexual relationships scale, scores were obtained by adding and then dividing items scaled from one “not at all” to 10 “totally” through the number of items. A single item indicator was used to measure stigma (HIV-AIDS survey indicators database) on a scale of one “not at all” to four “much.”

Enactive experience. Enactive experience was assessed through having tested for HIV (HIV-AIDS survey indicators database) measured as yes or no and the PLWHA care experience scale. This score was obtained by adding two items measured as yes or no and dividing the sum by the number of items.

Outcome expectations. Single item indicators were used to measure professional risk expectation (Bluespruce, Dodge, Grothaus et al., 2001) and counseling expectation.

Items were scaled from one “not at all” to 10 “totally.”

Table 5.1 Scales Construction

<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>N</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HIV counseling Self-Efficacy</strong>*</td>
<td>I am able to ask about sexual practices:</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• males</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• females</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• girls</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• boys</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>170</td>
<td>.86</td>
</tr>
<tr>
<td><strong>Transmission knowledge</strong></td>
<td>The HIV/AIDS virus can be transmitted by an injury caused by a:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trim, Adams, &amp; Elliott, 2003, 7 items.</td>
<td>• Razor blade</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Scalpel</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Used needle</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>187</td>
<td>.66</td>
</tr>
<tr>
<td><strong>Attitudes toward sexual relationships</strong></td>
<td>It is important for me not to have sexual intercourse before</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miller, Norton, Fan, &amp; Christopherson,</td>
<td>I get married</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The risk of AIDS and other sexually transmitted diseases is reason enough for teenagers to avoid sexual intercourse before they’re married.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Having sexual intercourse is something only married couples should do.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Even if I am physically mature, that doesn’t mean I’m ready to have sex.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>176</td>
<td>.71</td>
</tr>
</tbody>
</table>
1998, 12 items, α = .85

- People who do not want to have sexual intercourse should have the right to say no.

**Motivation to nursing***

I decided to study nursing because:
- My community appreciates health professionals
- My family wanted me to have helping profession
- It is a good profession for a Christian
- I enjoy nursing
- I like working with people

| 175 | .71 |

**PLWHA care experience***

Have you already taken care of a:
- An HIV positive patient
- A patient sick with AIDS

| 197 | .73 |

* Items derived from the qualitative study

Internal reliability of scales was assessed through Cronbach’s alpha measures. The difference in Cronbach’s alpha between 2nd and 3rd year students, measured with No-Hands-Stats (Lee, 1998) was not significant and therefore all students were included in multivariate analysis.

**DATA COLLECTION**

The questionnaire was anonymous. All selected students participated. Respondents signed the informed consent form after receiving verbal explanation about its content. Each participant was offered a notebook and a pen, regardless of how much of the questionnaire was completed. Confidentiality was insured through private seating in the classroom and questionnaire collection face down by the principal investigator. No student made use of the available debriefing session or contact information. The study procedures were approved by the human subjects review board of Loma Linda University and study authorization was given by the Ministry of Health in Rwanda.

**DATA ANALYSIS**

All selected students completed the questionnaire. The data were analyzed with the assistance of predictive analytics software technology (SPSS 15). Data were entered and cleaned, then examined for outliers and assumptions. Pearson chi-squares and likelihood ratio described categorical variables. Mean standard deviation and independent
t-tests described continuous variables, and median, range and Mann-Whitney U tests described non-parametric variables. After descriptive observations were examined, we followed a data reduction model building strategy as follows: significant relationships between the hypothesized independent variables and our outcome variables were determined with univariate regression. Significant independent variables were then entered into the final model and multiple linear regression analysis used to further investigate what variables structure was correlated with counseling self efficacy. In the end, six variables were retained for the final multiple regression model: religious affiliation, HIV transmission knowledge, sexual prevention knowledge, mother to child transmission knowledge, PLWHA care experience and counseling outcome expectations.

Results

Researchers first compared 2nd and 3rd year nursing students for differences regarding sociodemographics, HIV knowledge, attitudinal factors, enactive experiences, outcome expectations and counseling self-efficacy.

SAMPLE CHARACTERISTICS

Sociodemographics of respondents are shown in Table 2a. The average age of respondents was 21 years. Females (81.7%) were overrepresented. More than 63% of students came from rural areas. Fifty-six percent lived in a school dormitory and 36.3% with their relatives. More than 49% were affiliated with a Protestant denomination and 42.8% identified themselves as Catholics. Farming was the most common occupation of both fathers (50.6%) and mothers (56.3%). Second and 3rd year students did not have significantly different socio-demographic profiles.
Table 5.2a. Descriptive Statistics for Sociodemographics Comparing 2nd and 3rd year Students in Rwanda (N = 203)

<table>
<thead>
<tr>
<th>Variables</th>
<th>2nd year</th>
<th>3rd year</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>90</td>
<td>21.1</td>
<td>96</td>
</tr>
<tr>
<td>Female</td>
<td>78.9</td>
<td>84.4</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>single</td>
<td>100</td>
<td>92</td>
<td>97</td>
</tr>
<tr>
<td>married</td>
<td>8</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Home location</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rural</td>
<td>86</td>
<td>67.4</td>
<td>92</td>
</tr>
<tr>
<td>City</td>
<td>32.6</td>
<td>40.2</td>
<td></td>
</tr>
<tr>
<td>Dormitory</td>
<td>50</td>
<td>62.1</td>
<td></td>
</tr>
<tr>
<td>Living quarters</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Family</td>
<td>98</td>
<td>39.8</td>
<td>95</td>
</tr>
<tr>
<td>Friends</td>
<td>4.1</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Orphanage</td>
<td>6.1</td>
<td>1.1</td>
<td></td>
</tr>
<tr>
<td>Protestant</td>
<td>49.5</td>
<td>49.5</td>
<td></td>
</tr>
<tr>
<td>Religious affiliation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Catholic</td>
<td>99</td>
<td>42.4</td>
<td>97</td>
</tr>
<tr>
<td>Other</td>
<td>8.1</td>
<td>7.2</td>
<td></td>
</tr>
<tr>
<td>Farmer</td>
<td>55.2</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>Father's occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office or trade worker</td>
<td>87</td>
<td>21.8</td>
<td>87</td>
</tr>
<tr>
<td>Worker</td>
<td>8</td>
<td>10.3</td>
<td></td>
</tr>
<tr>
<td>Other or deceased farmer</td>
<td>14.9</td>
<td>14.9</td>
<td></td>
</tr>
<tr>
<td>Mother's occupation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Office or trade worker</td>
<td>88</td>
<td>19.3</td>
<td>93</td>
</tr>
<tr>
<td>Worker</td>
<td>6.8</td>
<td>9.7</td>
<td></td>
</tr>
<tr>
<td>Other or deceased</td>
<td>14.8</td>
<td>16.1</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>85</td>
<td>m = 20.78</td>
<td>93</td>
</tr>
</tbody>
</table>

* p ≤ .05

DESCRIPTIVE STATISTICS

Relevant variables for 2nd year and 3rd year students were compared (Table 2b) using chi-squares for categorical variables, independent t-tests for continuous variables and Mann-Whitney U for non-parametric variables. In addition to independent variables, we completed descriptive analysis by including relevant single items on HIV transmission beliefs and professional HIV prevention.

HIV counseling self-efficacy. 3rd year students did not score significantly higher on the scale than 2nd year students. Both groups reported a medium degree of Self-Efficacy.

Factual knowledge. We found misconceptions about HIV transmission. Twelve percent of 3rd year students did not answer correctly on “HIV can be transmitted by insects” and were in this not significantly different from 2nd year students. One out of ten
did not answer correctly on "HIV could be acquired through witchcraft." However, the proportion of correct answers was statistically highly significant (p ≤ .01) compared to 2nd year students. A significantly higher proportion of 3rd year students (95%) answered correctly on "a person looking well could be HIV+" (p ≤ .01). Twenty seven percent of 3rd year students didn’t answer correctly on HIV transmission by a scratch and there was no significant group difference for this item; however twice as many 3rd year students (18%) reported that professional risk could be prevented by avoiding contact with PLWHA. Ninety four percent of students in both groups reported that one should use gloves for all procedures. This was the single highest incorrect response rate. More than 30% of respondents in both groups didn’t answer correctly on sexual risk prevention. Eighteen percent of 3rd year respondents did not answer correctly on mother to child HIV transmission but the proportion of correct answers was statistically significant compared to 2nd year respondents (p ≤ .01). There was no significant group difference for the professional transmission knowledge scale.

Attitudinal factors. Third year nursing students (M = 2.21; SD = 1.12) reported a lower degree of stigmatization (p ≤ .05) compared to 2nd year students (M = 2.52; SD = 1.06). Both groups reported similar conservative attitudes on the attitudes toward sexual relationships scale. Third year students scored no differently from 2nd year students on nursing motivation.

Enactive experience. Thirteen percent of exiting (3rd year) students reported no PLWHA care experience. In this they were not significantly different from 2nd year students. Third year students reported less care of PLWH (77%) than of PLWA (82%).
With less than 40% of students having ever undergone HIV testing in both groups, there was no statistically significant group difference.

**Outcome expectations.** Third year students (m = 10, range 1-10) had higher counseling expectations than 2nd year nursing students (m = 8, range 1-10). The difference was very highly significant (p ≤ .00). Although 3rd year students reported more positive professional risk expectation, there was no statistically significant group difference.

**Table 5.2b** Descriptive Statistics for Knowledge, Attitudes, Enactive Experience, Outcome Expectations and Self-efficacy Comparing 2nd and 3rd year Students in Rwanda (N = 203)

<table>
<thead>
<tr>
<th>Class of variables</th>
<th>Variable</th>
<th>2nd year</th>
<th>3rd year</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factual knowledge</td>
<td>A person looking healthy may be HIV+ (correct) ***</td>
<td>94</td>
<td>76.6</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>HIV can be acquired by poisoning 1 (correct) ***</td>
<td>96</td>
<td>71.9</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Some insects may transmit HIV (correct)</td>
<td>98</td>
<td>84.7</td>
<td>97</td>
</tr>
<tr>
<td></td>
<td>HIV can be transmitted through a scratch (correct)</td>
<td>98</td>
<td>24.5</td>
<td>98</td>
</tr>
<tr>
<td></td>
<td>Reduction of professional risk by avoiding contact with HIV+ persons (correct)</td>
<td>96</td>
<td>90.6</td>
<td>95</td>
</tr>
<tr>
<td></td>
<td>Reduction of professional risk by wearing gloves for all procedures (correct)</td>
<td>100</td>
<td>6.0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Sexual risk prevention knowledge</td>
<td>95</td>
<td>67.4</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Mother to child transmission knowledge ***</td>
<td>96</td>
<td>55.2</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>Transmission knowledge (0-10) (mean)</td>
<td>94</td>
<td>7.80</td>
<td>93</td>
</tr>
<tr>
<td>Attitudinal factors</td>
<td>Attitudes toward sexual relationships (1-10) (mean)</td>
<td>81</td>
<td>7.80</td>
<td>94</td>
</tr>
<tr>
<td></td>
<td>Stigma (1-4) (mean) *</td>
<td>92</td>
<td>2.52</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>Nursing motivation score (1-10) (mean)</td>
<td>69</td>
<td>6.58</td>
<td>84</td>
</tr>
<tr>
<td></td>
<td>Have you already taken care of a patient sick with AIDS (yes) *</td>
<td>99</td>
<td>69.7</td>
<td>99</td>
</tr>
<tr>
<td></td>
<td>Have you already taken care of an HIV positive patient (yes)</td>
<td>99</td>
<td>65.7</td>
<td>99</td>
</tr>
<tr>
<td>Enactive experience</td>
<td>PLWHA care experience log 10 (0-1) (mean)</td>
<td>76</td>
<td>.93</td>
<td>86</td>
</tr>
<tr>
<td></td>
<td>Have you ever been tested for HIV</td>
<td>32</td>
<td>39.6</td>
<td>32</td>
</tr>
<tr>
<td></td>
<td>Professional risk expectation (1-10) (mean)</td>
<td>95</td>
<td>6.41</td>
<td>100</td>
</tr>
<tr>
<td>Outcome expectations</td>
<td>Counseling expectation (1-10) (Man-Whitney U) ***</td>
<td>97</td>
<td>8</td>
<td>101</td>
</tr>
<tr>
<td></td>
<td>HIV counseling Self-Efficacy (1-10) (mean)</td>
<td>73</td>
<td>5.61</td>
<td>97</td>
</tr>
</tbody>
</table>

* p ≤ .05; *** p ≤ .001

1 Form of witchcraft in the context
UNIVARIATE REGRESSION ANALYSIS

The analysis included all hypothesized independent variables and relevant demographics: school year, gender, religious affiliation, mother’s occupation and father’s occupation (Table 3). Dummy variables were created for categorical variables.

Among demographics, school year, gender, mother’s occupation and father’s occupation had no effect on HIV counseling self-efficacy. Being affiliated with the Catholic Church was highly correlated with HIV counseling self-efficacy ($\rho \leq .00$) in comparison to being affiliated with a Protestant denomination.

Attitudes toward sexual relationships, stigma, motivation to nursing, having been tested for HIV and professional risk expectation had no effect on HIV counseling efficacy.

There was a significant positive effect of HIV transmission knowledge ($\rho \leq .05$) and sexual prevention knowledge ($\rho \leq .05$) and a significant negative effect for mother to child transmission knowledge ($\rho \leq .05$) on HIV counseling self-efficacy. Experience caring for PLWHA ($\rho \leq .01$) and counseling expectation ($\rho \leq .05$) had a significant positive effect on HIV counseling self-efficacy. There was a small effect for all significant correlations.
Table 5.3 Univariate Regression of Counseling Self-efficacy with Dependent Variables Among Nursing Students in Rwanda (N=203)

<table>
<thead>
<tr>
<th>Class of Variables</th>
<th>variable</th>
<th>β</th>
<th>ρ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sociodemographics</td>
<td>School year</td>
<td>.14</td>
<td>.07</td>
</tr>
<tr>
<td></td>
<td>Gender</td>
<td>-.16</td>
<td>.40</td>
</tr>
<tr>
<td></td>
<td>Religious affiliation (protestant/catholic)</td>
<td>.23</td>
<td>.00**</td>
</tr>
<tr>
<td></td>
<td>Profession mother</td>
<td>.02</td>
<td>.80</td>
</tr>
<tr>
<td></td>
<td>Profession father</td>
<td>.08</td>
<td>.32</td>
</tr>
<tr>
<td></td>
<td>Transmission knowledge</td>
<td>.18</td>
<td>.03*</td>
</tr>
<tr>
<td>Knowledge</td>
<td>Sexual prevention knowledge</td>
<td>.18</td>
<td>.02*</td>
</tr>
<tr>
<td></td>
<td>Mother to child transmission knowledge</td>
<td>-.17</td>
<td>.03*</td>
</tr>
<tr>
<td></td>
<td>Attitudes toward sexual relationships</td>
<td>.05</td>
<td>.58</td>
</tr>
<tr>
<td>Attitudinal factors</td>
<td>Stigma</td>
<td>-.09</td>
<td>.24</td>
</tr>
<tr>
<td></td>
<td>Nursing motivation</td>
<td>-.09</td>
<td>.27</td>
</tr>
<tr>
<td>Enactive behavior</td>
<td>PLWHA care experience</td>
<td>.20</td>
<td>.01**</td>
</tr>
<tr>
<td></td>
<td>Tested for HIV</td>
<td>-.01</td>
<td>.87</td>
</tr>
<tr>
<td>Outcome expectations</td>
<td>Professional risk expectations</td>
<td>.08</td>
<td>.31</td>
</tr>
<tr>
<td></td>
<td>Counseling expectations</td>
<td>.16</td>
<td>.03*</td>
</tr>
</tbody>
</table>

• p ≤ .05; **p ≤ .01

MULTIVARIATE REGRESSION ANALYSIS

We used all independent variables with a significant relationship to counseling Self-Efficacy in the final model.

In this model, HIV transmission knowledge had a positive and statistically highly significant (p ≤ .01) effect on Self-Efficacy and sexual prevention knowledge a positive and statistically significant (p ≤ .05) effect. We found affiliation with the Catholic Church had a positive significant effect on HIV counseling self-efficacy (p ≤ .05). Experience caring for PLWHA had a statistically highly significant (p ≤ .05) positive effect. Twenty percent of the variation in HIV counseling self-efficacy was explained by the variability of the predictors in the linear model.

Table 5.4 Predictors of HIV Counseling Self-efficacy (N = 138)

<table>
<thead>
<tr>
<th>Model variables</th>
<th>β</th>
<th>ρ</th>
</tr>
</thead>
<tbody>
<tr>
<td>Counseling self-efficacy</td>
<td>.19</td>
<td>.02*</td>
</tr>
<tr>
<td>Religious affiliation</td>
<td>.21</td>
<td>.01**</td>
</tr>
<tr>
<td>HIV transmission knowledge</td>
<td>.17</td>
<td>.04*</td>
</tr>
<tr>
<td>Sexual prevention knowledge</td>
<td>-.11</td>
<td>.20</td>
</tr>
<tr>
<td>Mother to child transmission knowledge</td>
<td>.21</td>
<td>.01**</td>
</tr>
<tr>
<td>PLWHA care experience</td>
<td>.13</td>
<td>.12</td>
</tr>
</tbody>
</table>

R square = 20%

* ps .05; **ps .01
Discussion

No variable class confirms the hypothesis that 3\textsuperscript{rd} year students would score more positively than 2\textsuperscript{nd} year students. In comparison, more than 90\% of the population in Rwanda had heard about HIV and was able to cite at least one preventive measure in 2005 (Institut National de la Statistique, 2006). Although a higher proportion of exiting (3\textsuperscript{rd} year) students correctly answered most knowledge questions, addressing the challenge of the HIV pandemic requires current and correct knowledge on HIV transmission and prevention. The lower than expected results on factual knowledge among 3\textsuperscript{rd} year students might point to other influences on the practical application of knowledge. The staggering individually incorrect result about wearing gloves for procedures with PLWHA may indicate false beliefs concerning HIV transmission or stigmatizing attitudes. It might also be linked to the students’ experience of low environmental controllability while giving care, thus arousing anxiety (Bandura, 2000c). This could be confirmed by non significant professional expectation difference for 3\textsuperscript{rd} year nursing students. It would point to the need to integrate discussion on beliefs in the curricula as well as contextualized teaching, taking into account local environmental challenges.

Results on attitudes toward sexual relationships are congruent with recent findings on values regarding teenage sex in sub-Saharan Africa (Ageyei-Mensah, S, 2005) and values held among Rwandans. However, very rarely have studies on stigma described positive attitudes toward PLWHA among nursing staff or students. Third year students reported significantly less stigmatizing attitudes toward PLWHA than 2\textsuperscript{nd} year students and more PLWHA care experience. Uwakwe (2000) similarly found that connecting with PLWHA is correlated with a lower degree of stigma. This emphasizes the need to foster
PLWHA care among nursing students. Conservative societal and personal attitudes toward sexual activity didn’t seem to influence counseling self-efficacy; this might indicate the ability to separate personal and professional values, as students develop positive counseling expectations.

A higher proportion of students answered having cared for PLWA than for PLWH. This raised questions about their knowledge of HIV and their awareness that all patients should be considered as potentially HIV+ as specified in standard precautions. This clarification could be important as there was a significant relationship between PWLHA care experience and counseling self-efficacy.

The preceding elements of discussion could, at least partly explain why 3rd year students didn’t report better counseling self-efficacy. The level of HIV prevention knowledge, experience of PLWHA care and counseling self-efficacy among 3rd year nursing students in Rwanda may be insufficient for these soon-to-be nurses who will be at the forefront of the fight against the HIV pandemic. Counseling is one of the core skills for HIV prevention and care and should be included in nursing programs.

Factual and procedural knowledge form the base of self-efficacy. However, the importance of knowledge in this study doesn’t replicate results of other studies on self-efficacy. Special attention might be needed, in the context of nursing studies, to differentiate factual knowledge from its practical implementation.

If knowledge and PLWHA care experience were expected predictors of self-efficacy, religious affiliation as uncovered in this study was not. Abundant research indicates that religious commitment has a positive influence on health determinants such as social support and altruism. It is an important component of life for many Africans.
(Chinouya & O'Keefe, 2005), but little is known about how religious affiliation among Christians may predict self-efficacy in a domain related to sexual practices. Affiliation with one of the Protestant denominations might, in the Rwandan context, foster more conservative attitudes than Catholic affiliation. However, religion could also be a covariate at a similar level across domains of functioning as described by Bandura (2000d). The results may then be linked to the general level of functioning and not specifically to HIV counseling self-efficacy. More studies need to be conducted in that area.

**Limitations.** In this study, we used a cross-sectional design and may only establish relationships, but no causality. We partly used contextualized single item measures as reliability of scale could not be transposed in the Rwandan context and mono-method bias could have threatened construct validity. Reliable scales should be made available for further studies. Although confidentiality was ensured, some students might have answered according to their perception of social desirability thus threatening internal validity. To ensure sufficient command of the language of higher education, we selected 2\textsuperscript{nd} and 3\textsuperscript{rd} year students thus narrowing the scope of findings. For further studies, a longitudinal study from entry level student to active professional could be of interest. Active promotion of HIV risk prevention through mass media communication, VCT and ART in Rwanda in recent years might have introduced a historical bias. Cultural, socio-economic and education system disparities may limit generalization to nursing studies outside of Rwanda and higher academic level of nursing education.

**Suggestions for Further Research.** In the light of the results, nursing students in Rwanda could benefit from a contextualized nursing education program including self-
efficacy building and strengthening HIV prevention skills and care coupled with a research design. The relationship between religious affiliation and interaction with PLWH should be further explored. New interventions targeting HIV prevention should include healthcare providers’ outcome studies to evaluate sustainability of intervention methods.

CONCLUSION

HIV counseling self-efficacy is at the center of the fight against the HIV pandemic. Nurses in Rwanda are at the forefront of this fight at the community level. Increasing counseling self-efficacy among nursing students in Rwanda is a priority. Mediating influences of knowledge should not be neglected and all sources of self-efficacy be combined. More time should be allotted in the curricula to discuss personal representations and values. Effort should be made to contextualize procedures and foster nursing students’ participation in PLWHA care. These findings might be of particular value as nursing education in Rwanda is transitioning from a high school degree to an undergraduate nursing degree.

References


A. General summary

Replicating validated research poses the challenge of relevance when transposing a questionnaire to other socio-cultural contexts. Our findings provide support for using qualitative findings to adapt questionnaires and increase research validity in different settings.

We identified gaps in knowledge and contextualization of HIV issues and care protocols among nursing students in Rwanda. They are cognitively not prepared and have not had the opportunity to work through emotional (Gueritault-Chalvin, Kalichman & Peterson, 2000) and socio-cultural issues. They have not received training enabling them to bridge potential gaps between the Rwandan world view regarding HIV health beliefs, such as illness occurrence through bewitchment (Konrfield, Babalola, Awasum & Quenum-Renaud, 2002), and the western medical education paradigm thus potentially leading to avoidance or denial of issues and cultural alienation through unresolved cognitive dissonances.

ALTHOUGH A HIGHER PROPORTION OF EXITING (3RD YEAR) STUDENTS CORRECTLY ANSWERED MOST KNOWLEDGE QUESTIONS, ADDRESSING THE CHALLENGE OF THE HIV PANDEMIC REQUIRES THOROUGH KNOWLEDGE OF HIV. THE LOW ENVIRONMENTAL CONTROL STUDENTS EXPERIENCE WHILE GIVING PLWH CARE MAY

The study, along with studies conducted in other international settings (Bandura, 2002), partially validated the self-efficacy construct. Factual and procedural knowledge remain at the base of self-efficacy. Combined with education methods including performance accomplishment, vicarious experience, verbal persuasion and emotional arousal (Bandura, 2000n), it will lead to efficacious professional behaviors. Addressing mediating factors of self-efficacy such as self-regulation and coping with emotions (Bandura, 2000o) will strengthen HIV counseling among nursing students in Rwanda.

B. Limitations

Active promotion of HIV risk prevention through mass media communication, VCT and ART in Rwanda in recent years might have introduced a historical bias. Because the study involved several steps over a 6 month period, a slight risk of contamination occurred. However, we believe that distance between school locations and
limited traveling opportunities prevented students from learning about the content of the survey.

We did not, for the qualitative study, seek randomization but applied theoretical sampling aligned with the research questions. This phase of the study was sensitive to interviewer bias. Using objectivity tools such as memos and following the procedures taken from grounded theory to analyze the data reduced bias risks.

During the quantitative phase we addressed the validity of the questionnaire through the pilot study. To further reduce construct validity issues and adequately measure the self-efficacy and outcome expectations constructs, we designed the questions according to the self-efficacy construct guidelines. Only groups of questions with a high Cronbach’s alpha were drawn from other questionnaires: “The items tapping the same domain of efficacy should be correlated with each other and with the total score” (Bandura, 2001). Contextualized scales not being available and US-based scales needing adaptation to the Rwandan context, mono-method bias may have threatened construct validity as we contextualized single item measures. Reliable contextualized scales should be made available for further studies.

Convenient sampling guided the selection of participants for the quantitative phase of the study, thus limiting generalization. To ensure sufficient command of the language of higher education, we selected 2nd and 3rd year students thus narrowing the scope of findings. Cultural, socio-economic and education system disparities may limit generalization to higher academic level of nursing education or nursing studies outside of Rwanda. However, the findings reveal important issues that may be of value to nursing education in other countries of sub-Saharan Africa.
Using self-reporting as the method to answer the questionnaire introduced social desirability bias, thus threatening internal validity. However, stressing the fact that there were no good or wrong answers and ensuring confidentiality decreased the risk for this bias.

Several confounders were taken into account: school year, gender, father and mother’s profession, and religion. The regression model integrated these variables.

This being a cross-sectional study, data analysis only showed strength of relationships but could not establish causality. Further longitudinal research would be needed in order to achieve this.

C. Conclusion

Our study validates the choice of a mixed-method approach in an unfamiliar environment as qualitative and quantitative results confirm each other. It also reaffirms the need for caution in replicating US based research scales and methods.

Findings reveal a lack of readiness to participate in HIV prevention and care activities among nursing students in Rwanda and provide support for the need to contextualize training, discuss culturally embedded beliefs, emphasize self-efficacy building and strengthen psychosocial counseling and health education skills. This study will inform the design and implementation of future training programs.

D. Recommendations

1. Dissertation Recommendations for Rwanda

In Rwanda the core of care takes place in rural primary health care settings where nurses play a central role. Aware of the importance of well trained healthcare professionals to provide quality services, public health authorities in Rwanda have
undertaken a transition from a high school nursing training level to an undergraduate nursing program. This study will inform decisions regarding the choice of education theories and methods.

As long as no effective immunization method is available, HIV remains a challenging infectious and deadly chronic disease. Antiretroviral therapy (ART) will protect PLWHA from untimely death and enable them to live productive lives, but adherence to treatment is a critical issue in light of resistance building processes. Today, health education provides the only tools to control the epidemic.

The HIV epidemic is and will remain closely linked to socioeconomic challenges. Poverty and loneliness in Rwanda lead to survival and/or promiscuous sex. Rwanda officially advocates for the Abstinence/Be Faithful/Condoms (ABC) prevention method. Nurses must feel comfortable and confident to promote and demonstrate this method convincingly and reduce barriers to its implementation. The study draws attention to areas of nursing education in Rwanda that require strengthening.

2. Dissertation Recommendations for Nursing

Although universal precautions and VCT protocols are standard procedures, the challenge resides in their effective implementation. The design of contextualized protocols in close collaboration with stakeholders should proceed from a thorough environmental and socio-cultural exploration. Experimenting nursing in a coherent way will empower nursing students and facilitate HIV counseling self-efficacy building. Discussing culturally embedded beliefs will strengthen psychosocial counseling and health education skills.
The study draws attention to the importance of approaching not only patients, but also nursing students, holistically. As they enter the program, they bring life experience, beliefs, values, and socio-economic context that will infuse their comprehension of nursing training. Reflexivity will help them blend in a holistic manner. Introduction to self-care is part of this holistic approach and would foster meaningful involvement of trained professionals free of burnout.

Nursing education in Rwanda is evidence based and integrates best practices. However, improving cultural and environmental contextualization will affect the overall quality of nursing in Rwanda as well as HIV prevention and care. The HIV rate linked to mostly sexual transmission proves to be an additional challenge and burden to a country with as yet insufficient healthcare workforce. The success of HIV policies in Rwanda will depend on nursing students’ preparedness to confidently step into HIV prevention and care.

3. Dissertation Recommendations for Health Education

Although the HIV epidemic has been instrumental in the development of health education research in sub-Saharan Africa, research has focused mostly on intervention. Health behavior change concepts central to health improvement in the population need to be contextualized. To ensure adequate measurement, they need to be explored for new or different meaning and relationships. Grounded theory seems to be one of the effective ways to explore the links with complex socio-cultural factors such as stigma in settings different from the one in which they were uncovered. Mixed-method research techniques allow for cross-examination and strengthen findings in this context.
Health education research on self-efficacy in sub-Saharan Africa focuses mostly on patients’ and community members’ outcomes. However, the success of an intervention doesn’t shed light on the sustainability of interventions among providers of the intervention. In the light of knowledge attrition, research needs to focus on service providers outcomes. Research focusing on self-efficacy as a major proxy measure of behaviors and a fundamental concept of health education seems to be particularly appropriate.

Nursing education traditionally focuses on care and less on health education. In Rwanda, nursing students didn’t seem to receive enough hands-on education regarding PLWHA care and counseling. As professionals, they will be leading the fight against the HIV pandemic in their community. This challenge will remain an important component of public health in many years to come. It is important for nursing students to develop better resources. Many resources that have been developed in the field of health education could be useful to them and should be integrated in nursing curricula.

Health educators in Rwanda need to work closely with nurses, providing them with the tools they need to efficiently foster health behavior change in the community, mentor the process, and help monitor outcomes.

4. Conclusion

As we reflect on the process of this study and the findings resulting from it, we realize that humility remains a fundamental principle of research, particularly in unfamiliar cultural and environmental settings. We recommend that only comprehensive research designs be implemented to address health education research issues in sub-Saharan Africa. to limit risk for biases and provide a strong scientific base for the
implementation of successful critical interventions, such as HIV prevention and care education of nursing students in Rwanda.
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development crisis. p.15. Online at:

students concerning HIV/AIDS: Implications for prevention in women.
Health Care Women International, 19, 327-42.
APPENDICES

A. IRB Approval

INSTITUTIONAL REVIEW BOARD
Exempt Notice

OFFICE OF SPONSORED RESEARCH • 11188 Anderson Street • Loma Linda, CA 92350
(909) 558-4531 (voice) • (909) 558-0131 (fax)

OSR # 53366
Printed: 01/15/2004

To: Montgomery, Susanne B
Department: Health Promotion & Education
Protocol: HIV/AIDS preventive behaviors among nursing students in Rwanda: relationship with knowledge, self-efficacy and outcome expectancies

Your application for the research protocol indicated above was reviewed administratively on behalf of the IRB. This protocol is determined to be exempt from IRB approval as outlined in federal regulations for protection of human subjects, 45 CFR Part 46.101(b)(2).

Stipulations: <None Specified>

Please note the PI's name and the OSR number assigned to this IRB protocol (as indicated above) on any future communications with the IRB. Direct all communications to the IRB c/o the Office of Sponsored Research.

Although this protocol is exempt from further IRB review as submitted, it is understood that all research conducted under the auspices of Loma Linda University will be guided by the highest standards of ethical conduct.

Signature of IRB Chair/Designee: Date: 1/26/2004

The Institutional Review Board holds Multiple Project Assurance (MPA) No. M-1295 with the U.S. Office for Human Research Protections and is assigned ID#01NR. This Assurance applies to the following institutions: Loma Linda University (and its affiliated medical practice groups), Loma Linda University Medical Center (including Loma Linda University Children's Hospital, LLU Community Medical Center), Loma Linda University Behavioral Medicine Center, and the Blood Bank of San Bernardino and Riverside Counties.

IRB Chair: Rhodes L. Rigsby, M.D.
Department of Medicine
(909) 558-2341, rrigsby@ahs.llumc.edu

IRB Administrator: Linda G. Halstead, M.A., Director
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IRB Specialist: Anuradha Job, MPH
Office of Sponsored Research
Ext 57130, Fax 80131, ajob@univ.llu.edu

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RE: Informed consent form for interview and focus group (OSR # 53366)

You are invited to enter a study because you are a nursing student. The purpose of this study is to learn how nurses’ training affects HIV-protective behaviors of nursing students in Rwanda. Participation in this study will take approximately one hour and involves taking part in an interview/focus group.

There is a small risk that you feel bad as we are talking about HIV/AIDS behaviors, but it may also be an opportunity for you to think about this subject. In any case, the study will expand the knowledge about HIV/AIDS protective behaviors.

Participation in this study is voluntary. It will not affect your training, if you decide not to participate or to stop during the interview/focus group. This interview will be audio taped. The tape will then be transcribed. The transcription will not contain any identifying information about you and will be assigned an ID number. Once the study is completed the tape will be destroyed. Any document resulting from this study will not disclose your identity. Nothing of what you will say will be disclosed verbally either. The interview will take approximately one hour.

There is no cost to you for participating in this study. You will receive the equivalent of $5 in nursing equipment for participating in this study.

If you wish to contact someone regarding any problem you may have regarding the study, you may contact Dr. Joseph Nzabamwita, MD, Kigali.

I have read the contents of the consent form and have listened to the verbal explanation given by the investigator. My questions concerning this study have been answered to my satisfaction. I hereby give voluntary consent to participate in this study. Signing this consent document does not waive my rights nor does it release the investigators, institution or sponsors from their responsibilities. I have been given a copy of this consent form.
C. Open-Ended Key Informant Questionnaire for Interviews

This is a confidential interview. I will be the only one who knows what you have said and will not repeat it to anybody. The purpose is to help me in designing a questionnaire that will really show the facets of HIV prevention among nursing students in Rwanda. This is how I would like to proceed: I will tape this interview, and then I will transcribe it on my computer, but without writing your name. As soon as I have transcribed this interview, I will erase the tape. When finished with the interviews, I will analyze them and summarize the conclusions. There are no right and wrong answers, the closer you stay to the truth the most helpful it is. I want to do a study that really helps understanding HIV in the nursing school setting in Rwanda. Don’t feel bad if you are not comfortable answering a question. Just tell me so. We will skip it. You also may discontinue the interview at any time if for some reason, this talk becomes too difficult for you. I appreciate the effort you have made in accepting this interview. Do you agree with this procedure?

Sign consent form

- Push record button

We will now begin with the interview. If you don’t understand my question, just tell me so. I know what I want to ask, but may not say it clearly!
Goal: Investigate knowledge, self-efficacy, outcome expectancies and barriers to HIV preventive behaviors and care for PLWH of male and female nursing students

1. Objective: Icebreakers

How did you decide to enroll in this nursing school?

What part of your studies do you enjoy most?

How does your family, your community perceive nursing and nurses?

2. Objective: Investigate knowledge about transmission mode, treatment and effective prevention methods of HIV

What are the causes of HIV according to people in your community? What are they according to nursing students? What do you think?

What are the treatments against HIV according to people in your community? What are they according to nursing students? What do you think?

What are the preventive methods against HIV according to people in your community? What are they according to nursing students? What do you think?

How does one get infected? Are there any other ways of getting it? What is the most likely way one will get it?

---

2 Questions in italics are prompts
What kind of treatment may be used? What are the most effective? Are there any traditional medicines that are effective?

What can one do to avoid getting infected with HIV? What works best?

3. Investigate knowledge, self-efficacy, outcome expectancies and barriers regarding condom use of male and female nursing students

Knowledge: What do people know about condoms in your community? What information have you received about condom use?

Behavior: How much do people use condoms? Have you used condoms yourself? Where could you get them?

OE (Outcome expectancies): How would someone of whom it is known he/she uses condoms seen? What do people expect as results of wearing condoms? In what would nursing students think differently? How would the judgment of the community affect your decision of wearing condoms or not?

SE (self-efficacy): Would you feel comfortable to ask for a condom? How comfortable would you be in applying it? How comfortable would it be for you to talk with your partner about using one?

What information have people received about condoms? Where did they get that information? What kind of information did you get? How did you get it?

Who has access to condoms? How easy is it to get them (location, price)? How does a woman access condoms?
What do people say about condoms? About people wearing condoms? How effective do people think condoms are for HIV prevention? How would a man using condoms be seen? How would a woman asking to use a condom be seen?

*How different is it for a male or a female to do these things? What would the risks be?*

4. **Investigate knowledge, self-efficacy, outcome expectancies and barriers regarding sexual activity of male and female nursing students**

**KN:** What is according to people in the community the relationship between sexual activity and HIV infection? Are there any sexual practices that are known to foster HIV infection? Are there any sexual practices that are known to prevent HIV infection?

**BE:** Are nursing students usually sexually active (*I am not talking about this school specifically*)? How would students prevent pregnancy? How do they avoid other undesirable outcomes, if there are any?

**OE:** What would the reasons for being sexually active be? What would reasons for not being sexually active be?

**SE:** What are the circumstances in which it would be difficult to refuse to have sex?

With whom are male nursing students active? With whom are female nursing students sexually active?

*How is a single sexually active male seen in the community? How is a single sexually active female seen in the community?*

*What are they for females? What are they for males?*
Thank you for your help so far. We are half way through. You have already valuably contributed to this study!

5. Investigate knowledge, self-efficacy, outcome expectancies and barriers regarding caring for people living with HIV of male and female nursing students

**KN:** What are, according to people in the community the risks of caring for PLWH? What are they according to nursing students? How do PLWH take care of their needs?

**BE:** What type of help do PLWH receive? What type of medical and nursing care do PLWH receive in healthcare facilities? What kind of nursing care have you given to PLWH?

**OE:** What do people in your community generally think about PLWH? What do nursing students think? Did you know any PLWH before you started nursing? How did you feel about them?

**SE:** What have you felt the most comfortable with in dealing with PWLA? What have you felt the most uncomfortable with?

*How do people in the community think they can avoid getting infected by a PLWH? When a person has AIDS where does he/she find help?*

*How are PLWH seen in the community? How are they looked at in healthcare facilities? How do other nursing students react to them?*

*What type of help is easy to give to PLWH? What type of help PLWH could need that is not easy to give? What are the barriers to care for PLWH?*
6. Investigate knowledge, self-efficacy, outcome expectancies and barriers regarding needlestick injuries of male and female nursing students

KN: What measures should we take if we know that a patient is HIV positive?

BE: What protective measures are usually available in healthcare facilities? What protective measures are available where you practice? Who uses them?

SE: How comfortable are you with applying these measures? Where does one get help when one receives a needlestick injury?

OE: What do healthcare facilities staffs think about the efficiency of professional protective measures? How important is it for healthcare facilities staff to follow universal precautions?

What have you been taught in class about avoiding contamination? Can you describe the steps of safe syringes and needles disposal?

How are needles and syringes disposed of where you practice? How much of what you have learned are you able to practice? What are the reasons for that fact?

What would be needed in healthcare facilities to help staff in using universal precautions? What would you need to feel more confident in using these methods?
7. Conclude

How did studying nursing influence the way you look at HIV prevention?

How have your studies helped you to prevent HIV? On the professional level? On the personal level? What else helped you efficiently? What else would you need to feel comfortable with doing HIV prevention?

What are your plans when you are finished studying?

_We’re done! Thank you for your time and sharing, I appreciate your help!_

If you want to talk about this interview, if you have any question or problem, please feel free to make an appointment with me any time.
### Check the box that best matches what you think

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<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
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<tbody>
<tr>
<td>1</td>
<td>May a person who looks healthy have the AIDS virus?</td>
<td></td>
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<tr>
<td>2</td>
<td>Can the HIV/AIDS virus be acquired by supernatural means such as poisoning?</td>
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<td>3</td>
<td>Can one get infected with the HIV virus by sharing a drink out of the same cup with someone who has AIDS?</td>
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<tr>
<td>4</td>
<td>May some insects transmit the HIV virus?</td>
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<td>5</td>
<td>Can people reduce their chances of getting the AIDS virus by using a condom correctly every time they have sex?</td>
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<td>6</td>
<td>Can people reduce their chances of getting the AIDS virus by having only one sex partner who has no other partners?</td>
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<td>7</td>
<td>Can people protect themselves against the AIDS virus by not having sex at all?</td>
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### One may reduce one’s own risk of getting HIV/AIDS at work by:

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<tr>
<td>8</td>
<td>Disposing of needles without recapping</td>
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<td></td>
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<tr>
<td>9</td>
<td>Sterilizing needles to save funds</td>
<td></td>
<td></td>
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<tr>
<td>10</td>
<td>Wearing gloves during all procedures</td>
<td></td>
<td></td>
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<tr>
<td>11</td>
<td>Using double gloving while doing sutures</td>
<td></td>
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<tr>
<td>12</td>
<td>Avoiding contact with people who are sick with AIDS</td>
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### The HIV/AIDS virus can be transmitted by:

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<tbody>
<tr>
<td>13</td>
<td>A splash of blood or body fluid to the eyes or mouth</td>
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<tr>
<td>14</td>
<td>An injury caused by a scratch</td>
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<tr>
<td>15</td>
<td>An injury caused by a bite</td>
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<tr>
<td>16</td>
<td>An injury caused by a razor blade</td>
<td></td>
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<tr>
<td>17</td>
<td>An injury caused by a scalpel</td>
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<tr>
<td>18</td>
<td>An injury caused by a clean needle</td>
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<tr>
<td>19</td>
<td>An injury caused by a used needle</td>
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</table>

### To dispose safely of trash, I need:

<p>| | | | |</p>
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<thead>
<tr>
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<tbody>
<tr>
<td>20</td>
<td>A container with a lid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>Single use needles</td>
<td></td>
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<tr>
<td>22</td>
<td>An open container clearly marked</td>
<td></td>
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<tr>
<td>23</td>
<td>A burner built according to norms</td>
<td></td>
<td></td>
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<tr>
<td>24</td>
<td>A trash storage place out of reach of children</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>A prick resistant container</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26</td>
<td>A large and deep pit</td>
<td></td>
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</tbody>
</table>

### If I prick myself a used needle, I should:

<p>| | | | |</p>
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<thead>
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</thead>
<tbody>
<tr>
<td>27</td>
<td>Be courageous</td>
<td></td>
<td></td>
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<tr>
<td>28</td>
<td>Tell my supervisor</td>
<td></td>
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<tr>
<td>29</td>
<td>Check if the patient is HIV+</td>
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<tr>
<td>30</td>
<td>Disinfect the wound with alcohol</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31</td>
<td>Get tested for the HIV virus</td>
<td></td>
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</tbody>
</table>
Answers to this questionnaire are anonymous. This is not a test. There is no right or wrong answers. Give you own opinion. Thank you for participating.
Check the box that best matches what you think

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>Can the HIV virus be transmitted from mother to child?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>33</td>
<td>Can the HIV virus be transmitted from mother to child during pregnancy?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34</td>
<td>Can the HIV virus be transmitted from mother to child during delivery?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>Can the HIV virus be transmitted from mother to child during breastfeeding?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>Can avoiding breastfeeding prevent the baby from getting the HIV infection from his/her mother?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>Can mother to child transmission of the AIDS virus be prevented by antiretroviral therapy during pregnancy?</td>
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<td></td>
</tr>
</tbody>
</table>

38. The device bearing the highest risk of HIV/AIDS transmission is? (Circle only one answer):

- a. Peripheral venous catheter
- b. A blade
- c. A suture needle
- d. A butterfly needle
- e. An intramuscular needle
- f. I don’t know

39. Have you ever been tested for HIV? (Circle only one answer)

- a. Yes (skip question 40)
- b. No (skip question 41)
- c. I refused (skip question 41)
- d. I don’t know (skip questions 40 et 41)

40. Which one of the following would you say is the main reason why you have not been tested? (Circle only one answer)

- a. It’s unlikely you’ve been exposed to HIV
- b. You were afraid to find out if you were HIV positive
- c. You didn’t want to think about HIV or about being HIV positive
- d. You were worried your name would be reported if you tested positive
- e. You don’t like needles
- f. You don’t trust the results to be confidential
- g. You are afraid of losing job, insurance, housing, friends, family, if people knew you was HIV positive
h. You didn’t know where to get tested
i. Some other reason: specify

41. (Not including your blood donations), which of these would you say was the main reason for your last HIV test? (Circle only one answer)

a. Just to find out/worried that you were infected
b. Because a doctor, nurse or other health care professional asked you to
c. Because sex partner asked you to
d. For hospitalization or surgical procedure
e. To comply with guidelines for health workers
f. Because of pregnancy
g. Some other reason: specify
### Check the box that best matches what you think

<table>
<thead>
<tr>
<th>Question</th>
<th>Not at all</th>
<th>A little</th>
<th>Somewhat</th>
<th>Very</th>
</tr>
</thead>
<tbody>
<tr>
<td>42 How much would you say you feel angry at PLWH?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>43 How much would you say you feel afraid of PLWH?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>44 How much would you say you feel disgusted of PLWH?</td>
<td></td>
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<tr>
<td>45 Should people with AIDS be legally separated from others to protect the public health?</td>
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<tr>
<td>46 Should the names of people with AIDS be made public so that others can avoid them</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>47 Have people who got AIDS through sex gotten what they deserve?</td>
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</tbody>
</table>

### Check the box that best matches what you think

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>48 If a member of your family became sick with the AIDS virus, would you be willing to care for him or her in your household?</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>49 If a member of your family became infected with the AIDS virus, would you want it to remain a secret?</td>
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<tr>
<td>50 If a female nurse had the AIDS virus but is not sick, should she be allowed to continue working as a nurse?</td>
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<td></td>
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<tr>
<td>51 Have you given care to a patient sick with AIDS?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>52 Have you given care to an HIV positive patient?</td>
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<td></td>
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</tr>
<tr>
<td>53 Have you had sex in the last 12 months?</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>54 Have you had sex with someone else than your husband or your wife in the last 12 months?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>55 Have you had sex with more than one person in the last 12 months</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>56 Have you had commercial sex in the last 12 months?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>57 Did you use a condom last time you had sex?</td>
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</tbody>
</table>

58. **Have you had sex at all?** *(Circle only one answer. If you answered no, skip questions 59 to 62)*

a. Yes  b. No  c. Not sure

---

3 PLWA: People Living With Aids
59. At what age, have you had sex for the first time?

__________ years old

60. What is the total number of your sexual partners, since you have begun to be sexually active?

__________ sexual partners

58. Did you use a condom last time you had sex with someone else than your friend or spouse? (Circle only one answer)

a. Yes  b. No  c. That person is not sick  d. I haven’t had sex with anybody else

61. Did you use a condom last time you had sex with your friend or spouse? (Circle only one answer)

a. Yes  b. No  c. I haven’t had sex with my friend or spouse

<table>
<thead>
<tr>
<th>Check the box that best matches what you think</th>
</tr>
</thead>
<tbody>
<tr>
<td>How sure are you that you could:</td>
</tr>
<tr>
<td>63 Tell your sex partner that you want to put on a condom</td>
</tr>
<tr>
<td>64 Use a male condom correctly</td>
</tr>
<tr>
<td>65 Buy a condom</td>
</tr>
<tr>
<td>66 Refuse to have sex when you don’t want to</td>
</tr>
<tr>
<td>67 Be abstinent when far away from home</td>
</tr>
<tr>
<td>68 I am confident that I can get accurate information about sexual behavior from my patients</td>
</tr>
</tbody>
</table>

120
I have the knowledge and skills to assess patient's readiness for behavior change.

I am comfortable about asking sexual practices; Couples

<table>
<thead>
<tr>
<th>Males</th>
<th>Females</th>
</tr>
</thead>
<tbody>
<tr>
<td>74</td>
<td>73</td>
</tr>
</tbody>
</table>

Girls

<table>
<thead>
<tr>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>70</td>
</tr>
</tbody>
</table>

I am confident that I can avoid pricking myself with a used needle when:

<table>
<thead>
<tr>
<th>I have a lot of work</th>
<th>I feel tired after long hours of work</th>
<th>There is an emergency</th>
</tr>
</thead>
<tbody>
<tr>
<td>75</td>
<td>76</td>
<td>77</td>
</tr>
</tbody>
</table>

I use a different equipment than usual:

<table>
<thead>
<tr>
<th>I use problems with</th>
<th>I am preoccupied with</th>
<th>I feel very tired after long hours of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>78</td>
<td>77</td>
<td>76</td>
</tr>
</tbody>
</table>

I am comfortable about asking sexual practices:

<table>
<thead>
<tr>
<th>I have the knowledge and skills to assess patient's readiness for behavior change</th>
</tr>
</thead>
<tbody>
<tr>
<td>69</td>
</tr>
</tbody>
</table>

Check the box that best matches what you think.

<table>
<thead>
<tr>
<th>Not at all</th>
<th>Almost not</th>
<th>Very little</th>
<th>Little</th>
<th>Little moderately</th>
<th>Moderately</th>
<th>Much</th>
<th>Very much</th>
<th>Totally</th>
<th>Almost</th>
<th>Totally</th>
</tr>
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<tbody>
<tr>
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</tbody>
</table>
Check the box that best matches what you think

<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th>almost not</th>
<th>very little</th>
<th>little</th>
<th>moderately little</th>
<th>much</th>
<th>very much</th>
<th>almost totally</th>
</tr>
</thead>
<tbody>
<tr>
<td>83</td>
<td>If my partner wanted me to participate in &quot;risky&quot; sex and I said that we needed to be safer, we would still probably end up having &quot;unsafe&quot; sex.</td>
<td></td>
<td></td>
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<tr>
<td>84</td>
<td>If a sexual partner didn't want to use condoms, we would have sex without using condoms.</td>
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<tr>
<td>85</td>
<td>It is important for me not to have sexual intercourse before I get married.</td>
<td></td>
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<tr>
<td>86</td>
<td>Having sexual intercourse should be viewed as just a normal and expected part of teenage dating relationships.</td>
<td></td>
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<tr>
<td>87</td>
<td>It is against my values for me to have sexual intercourse while I am an unmarried teenager.</td>
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<tr>
<td>88</td>
<td>A teen who has had sexual intercourse outside of marriage would be better off to stop having sexual intercourse and wait until marriage.</td>
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<tr>
<td>89</td>
<td>Teens who have been dating the same person for a long time should be willing to go along and have sexual intercourse if their partner wants to.</td>
<td></td>
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</tr>
<tr>
<td>Check the box that best matches what you think</td>
<td>not at all</td>
<td>almost not</td>
<td>very little</td>
<td>little</td>
<td>moderately little</td>
<td>moderately</td>
<td>much</td>
<td>very much</td>
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<tr>
<td>90 The risk of AIDS and other sexually transmitted diseases is reason enough for teenagers to avoid sexual intercourse before they're married.</td>
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<tr>
<td>91 It is all right for teenagers to have sexual intercourse before they're married if they are in love.</td>
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<tr>
<td>92 Having sexual intercourse is something only married couples should do.</td>
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<tr>
<td>93 Even if I am physically mature, that doesn't mean I'm ready to have sex.</td>
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<tr>
<td>94 I think it is OK for kids my age to have sex.</td>
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<tr>
<td>95 People who do not want to have sexual intercourse should have the right to say no.</td>
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<tr>
<td>96 My sexual values and beliefs agree with those of my parent(s).</td>
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<tr>
<td>97 With certain patients, I don't worry about getting HIV/AIDS.</td>
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<tr>
<td>98 I am very concerned about accidentally contracting AIDS from a patient.</td>
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<tr>
<td>99 If I ask married couples about sexual risk behaviors, they will be offended.</td>
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<tr>
<td>100 I become frustrated with my patients who continue to place themselves at high risk for HIV by having unprotected sex.</td>
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<tr>
<td></td>
<td>Check the box that best matches what you think</td>
<td>not at all</td>
<td>almost not</td>
<td>very little</td>
<td>little</td>
<td>moderately little</td>
<td>moderately</td>
<td>much</td>
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<tr>
<td>101</td>
<td>Few HIV infected persons are genuinely concerned about the risk of spreading HIV.</td>
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<tr>
<td>102</td>
<td>Can a woman who has an HIV+ partner refuse to have sex with him?</td>
<td></td>
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<td></td>
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<tr>
<td>103</td>
<td>Can a woman who has an HIV+ partner suggest using a condom to have sex together?</td>
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<thead>
<tr>
<th></th>
<th>Check the box that best matches what you think</th>
<th>not at all</th>
<th>almost not</th>
<th>very little</th>
<th>little</th>
<th>moderately little</th>
<th>moderately</th>
<th>much</th>
<th>very much</th>
<th>totally</th>
<th>totally</th>
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</table>

**I study nursing because:**

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<tbody>
<tr>
<td>104</td>
<td>I can take better care of my family</td>
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<td></td>
<td></td>
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<tr>
<td>105</td>
<td>The community where I live appreciates health</td>
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<tr>
<td>106</td>
<td>I get a good salary</td>
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<tr>
<td>107</td>
<td>It is easy to find a job</td>
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<tr>
<td>108</td>
<td>My family wanted me to be in a helping profession</td>
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<tr>
<td>109</td>
<td>It is a good profession for a Christian</td>
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<tr>
<td>110</td>
<td>I like nursing</td>
<td></td>
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</tr>
<tr>
<td>111</td>
<td>I like working with people</td>
<td></td>
<td></td>
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<tr>
<td>112</td>
<td>My training gives me a possibility to go to</td>
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</table>

**113. Year of birth** (specify)
For all the questions that follow, circle only one answer for each question.

114. Gender
   a. Male   b. Female

115. Marital status
   a. Single   b. married   c. Divorced   d. Widowed

116. Year of schooling
   a. 5th   b. 6th

117. To which religion do you belong to?
   a. catholic   b. Adventist   c. Pentecostal
d. Moslem   e. Baha'i   f. Traditional
g. Other protestant   h. No religious affiliation

118. Home area
   a. District   b. Mairie: ______________________ (specify)

119. Lodging type (if answer d, skip questions 120 to 123)
   a. Dormitory   b. Family
c. Friends family   d. Orphanage

120. Father’s main professional activity
   a. Farmer   b. Chief/director   c. Employee
d. Worker   e. Shop owner/trade   f. Without profession
g. Other______________________(specify)
121. Father's education

a. Primary incomplete  
b. Primary complete

c. Secondary incomplete  
d. Secondary complete

e. University  
f. Illiterate

122. Mother's main professional activity

a. Farmer  
b. Chief/director  
  c. Employee

d. Worker  
e. Shop owner/trade  
f. Without profession

g. Other (specify)

122. Mother's education

a. Primary incomplete  
b. Primary complete

c. Secondary incomplete  
d. Secondary complete

e. University  
f. Illiterate

Thank you for your participation. Verify that you answered all questions.

Don't forget to get your gift!
E. Authorization Letter from the Ministry

REPUBLIQUE RWANDAISE

Kigali le 28/02/2002
N°949/12.00/2002

MINISTERE DE L’EDUCATION,
DE LA SCIENCE, DE LA TECHNOLOGIE
ET DE LA RECHERCHE SCIENTIFIQUE
B.P 622 KIGALI

CABINET DU MINISTRE

✓ A Madame Jacqueline WOSINSKI
P.O Box 576
Loma Linda CA 92354
ETATS UNIS D’AMERIQUE

Objet : votre requête de recherche

Madame,

C’est avec plaisir que nous vous informons que votre
requête de recherche en santé publique nous est bien parvenue au courant de ce mois de Février 2002.
Sur ce, vous aviez exprimé le souhait de mener des enquêtes dans les écoles publiques des sciences
infirmières surtout en administrant un questionnaire aux élèves de première et de troisième année.

Nous n’y voyons aucun inconvénient de mener votre
étude, surtout que vous avez accepté « de partager les résultats de votre recherche avec les professeurs
et les élèves selon les modalités à définir ensemble » avec le Ministère de l’Education, de la Science,
de la Technologie et de la Recherche scientifique.

En attendant votre disponibilité pour commencer
votre recherche, nous vous souhaitons plein succès dans vos études.

Ministre de l’Education, de la
Science, de la Technologie et de la
Recherche scientifique
Prof. Romain MURENZI