

Ecuador Health Professionals Perceived Knowledge and Beliefs About HIV and the Use of Standard Precautions A Cross-Sectional Descriptive Research Study

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Abstract

Background: Research studies show deficits regarding knowledge about the use of standard precautions and transmission of HIV and problematic attitudes towards persons who are HIV +. Ecuador is a middle income country with health issues related to poverty, and low education levels. The prevalence of HIV cases in Ecuador has been increasingly steadily for the past 25 years. There is a paucity of research conducted in Ecuador related to knowledge and the use of standard precautions by health workers. It has been found that knowledge regarding HIV transmission may be lacking and can be due to inadequate resources health professionals use to stay current with this topic. HIV related stigma is prevalent in medical settings worldwide.

Objective: To examine knowledge and health beliefs about HIV and the use of standard precautions. This research will assist health professionals to examine content needed related to HIV education and assess if health professionals are developing the knowledge, skills and attitudes needed to care for HIV+ patients.

Setting: A 250 bed public hospital in Ecuador, 25 bed unit, total staff of 75

Design: Cross Sectional Descriptive Research Design

Population: Thirty seven health professionals participated in this study. This included nurses, physicians, physical therapists, and laboratory personnel.

Methods: A cross sectional descriptive study of thirty seven health professionals in Ecuador was conducted. The four instruments used were: HIV Demographic Information, HIV Education Information, HIV Knowledge Questionnaire and HIV Health Care Belief Scale. For the reliability of the HIV Knowledge Questionnaire used in previous studies, Kuder Richardson formula 20 was used results were .7061. For the total reliability of the HIV Health Care Belief Scale in previous studies Cronbach's alpha was determined, results were 83. These instruments were developed by the author.

Results: Of the thirty seven health professionals who participated, only one subject passed the knowledge survey. Fears and misconceptions were prevalent, as most of the participants' information about HIV was obtained from college classes, books, and the media, and most were unsure about or chose not to work with an HIV+ patient. Most respondents would not choose to care for or were unsure if they would care for an HIV+ patient.

Conclusion: The findings suggest that health care workers in this setting lack knowledge about HIV transmission. The findings have implications for continuing education for professionals to incorporate evidence-based research as a base for accurate knowledge about HIV transmission. Of the 8 health belief concepts studied, moral sophistication was highly prominent in this sample, indicating participants were not offended by people who are HIV+, yet most of the participants would not choose to care for HIV+ patients or were unsure if they would care for an HIV+ patient.

Background

The term "standard precautions" refers to the guidelines established by the United States Centers for Disease Control (USCDC). The term "standard precautions" has replaced the term universal precautions since 2003. Prior to this date much of the research refers to the concept of "universal precautions". According to the research, differences in compliance with standard precautions have occurred across Latin America and Asia [1].

The USCDC and Prevention issued guidelines for the use of universal precautions for patient care during the mid 1980s. The guidelines are in place to encourage health care personnel to adhere to infection control precautions [2]. The guidelines place emphasis on the use of appropriate protective barriers for blood and body fluid exposures including gloves, masks, gowns, and protective eyewear, and hand washing [3].

Standard Precautions and Universal Precautions

Previous CDC recommendations on infection control (1986, 1993)

focused on the use of Universal Precautions to prevent transmission of blood borne pathogens. Universal Precautions were based on the concept that all blood and certain body fluids should be treated as infectious because it is impossible to know who may be carrying a blood borne virus. Thus, Universal Precautions should apply to all patients. The relevance of Universal Precautions applied to other potentially infectious materials was recognized, and in 1996, CDC replaced Universal Precautions with Standard Precautions. *Standard Precautions* integrate and expand Universal Precautions to include

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organisms spread by: Blood; All body fluids, secretions, and excretions except sweat, regardless of whether they contain blood; Non-intact skin; Mucous membranes. Saliva has always been considered a potentially infectious material in infection control. Standard Precautions include: Hand washing; the use of personal protective equipment, such as gloves, masks, eye protection, and gowns, that are intended to prevent the exposure of skin and mucous membranes to blood and other potentially infectious materials; Proper cleaning and decontamination of patient care equipment; Cleaning and disinfection of environmental surfaces. Injury prevention is through engineering controls or safer work practices. The Occupational Safety and Health Administration (OSHA) retain the use of the term "Universal Precautions" because they are concerned primarily with transmission of blood borne pathogens.

The Importance of this Study in Ecuador

This study is a beginning of needed research in South America as HIV stigma is prevalent in medical settings world-wide [4]. Studies from many countries have shown that specific intervention strategies, such as education, are influential in improving knowledge and compliance. This review concludes that it is imperative that future research examines how the attitudes and beliefs of practitioners can be influenced and changed to reinforce adherence to universal precautions within the clinical practice setting.

Although a small country, it is important to study this topic in Ecuador. Over the past 25 years the number of HIV cases has been increasing steadily in Ecuador [5]. In the year 2013 a significant increase in the number of HIV cases was reported most likely due to the implementation of HIV testing. Ecuador suffers from a lack of research concerning HIV and the limited information available differs from the official statistics released by the Ministry of Public Health of Ecuador (2009). Based on previous findings, there are deficits regarding HIV knowledge as well as problematic attitudes towards persons with HIV among health care professionals [6]. Review of the literature revealed that, worldwide, the human immunodeficiency virus (HIV) is a major medical, social, and public health problem [2]. During the past decade, the incidence of HIV (new infections) has continued to increase [7]. The appropriate use of standard precautions has the potential to reduce the incidence of contracting HIV for health care professionals [8]. Compliance is defined as always adhering to the use of the protective actions which prevent a person from contracting disease. In addition, poor knowledge about transmission of the HIV virus, among other key factors, has been correlated with non-compliance with the use of universal precautions [9].

The purpose of this study was to examine the use of standard precautions and health professional's knowledge and health beliefs about HIV in Ecuador. This research will assist health professions globally to examine content needed related to HIV education and if health professionals are developing the knowledge, skills and attitudes needed to care for HIV positive patients.

A Review of the Literature

Literature on the topic of knowledge and health beliefs about HIV and standard precautions among health care workers consistently demonstrates misconceptions, negative attitudes, and an overall lack of knowledge regarding universal precautions and HIV patients. Based on the review of the literature, there were a paucity of studies related to this topic in Ecuador; a few published articles in Ecuador will be reviewed here that relate to the subject matter.

A review of the literature conducted by Gammon et al. [10] relating to knowledge of and compliance with universal precautions amongst healthcare practitioners explains that universal precautions are considered an effective means of protecting patients and staff and controlling infection. The authors also identified aspects of universal precautions that need to be studied further. The consensus from this body of evidence is that, globally, knowledge of universal precautions is inadequate and compliance low [11-13].

Umeh, et al. [14] studied sources of knowledge, beliefs and attitudes about HIV among health care professionals and found there were generally negative feelings about views about the care of HIV/AIDS patients. The authors found the highest knowledge among doctors and the lowest among lab workers. The results suggest that, as knowledge increases, so do positive feelings and views towards patients with HIV/AIDS.

Health Care Workers - Global Review

Aisien et al. [15] conducted a study of health care workers, including doctors and nurses, regarding their knowledge on HIV and AIDS, universal precautions and attitude towards HIV. The researchers found poor adherence to universal precautions, which was attributed to lack of knowledge and the availability of materials.

Regarding attitudes, a study using a survey and conducted in Nigeria about knowledge and attitudes of health care workers regarding HIV/AIDS [16], participants (N=345), overall, did not correctly identify the manner in which HIV was transmitted and negative attitudes were more likely depending on the source of HIV infection. Recommendations included continuing education about the transmission of HIV.

Previous studies have found an association between service providers' discrimination against HIV patients and their fear of contracting HIV at work. In a study conducted in 40 county hospitals in two provinces of China, subjects' participants included doctors, nurses and lab technicians, who were randomly selected to assess universal precautions (UP) knowledge and training, UP adherence, availability of UP supplies and avoidance attitudes toward patients living with HIV/AIDS [17,18]. Results indicated that workers were reluctant to care for HIV patients and feared they would contract HIV.

In the area of misconceptions, researchers studying knowledge, attitudes and practices of health care workers in Libya towards post exposure prophylaxis for HIV [19] found that some misconceptions about HIV/AIDS existed. The authors conclude that health education is essential to limit risk of transmission and to protect staff and the welfare of the community. They further recommend occupational health clinics to be established in all hospitals to improve attitudes and practices.

In terms of knowledge, a cross-sectional study conducted with 195 health care workers in Ethiopia, found significant proportions of respondents had inadequate knowledge about post exposure prophylaxis for HIV [20]. A formal training for all health care workers was recommended. In general findings revealed new strategies must be developed to reduce the risk of occupational exposure in health care facilities.

In another study of hospital personnel in a hospital facility in Pakistan, poor knowledge was found to be a predictor of non

adherence to universal precautions [9]. This study was a cross sectional survey and included public, general practitioners and unqualified practitioners through a stratified random sampling technique. The researchers concluded that knowledge about mode of transmission of blood borne pathogens was very low. The use of universal precautions can improve with increase in knowledge.

However, experience and practice has been known to produce more positive outcomes among practitioners. In Viet Nam, a cross sectional survey of physicians' knowledge attitudes and practice about HIV was studied [21]. In this study, older physicians were more likely to have positive attitudes about HIV than did younger physicians. The level of knowledge, attitudes, and practices regarding HIV treatment suggest that further training is needed. In addition, in Greece, an assessment of knowledge and attitudes of newly-qualified doctors towards AIDS infection was studied Kyriazis et al. [22]. The vast majority of the doctors knew how HIV infection is spread; however, some believed HIV transmission is feasible through kissing and insect bites. The researchers suggest that it is imperative that doctors are constantly informed and updated about AIDS infection. This is in order to minimize their inhibitions and compensate for lack of knowledge, which is commonly an observation regarding new doctors.

Abolfotouch et al. [23] conducted a study on attitudes and willingness of nursing students to provide care for patients with HIV in Saudi Arabia. Results indicated the students need further education related to changing their negative attitudes about patients with HIV.

Research Studies- Ecuador

There is a paucity of research that include health professionals as subjects regarding HIV knowledge, transmission, and the use of standard precautions in Ecuador. A cross sectional study conducted with company workers found incorrect knowledge about HIV transmission in the majority of participants in Ecuador [24].

A recent study with adolescents in Ecuador assessing predictors of HIV related knowledge found age to be significantly associated to knowledge and risk behavior [25]. The Department of Public Health in Ecuador has made attempts to improve knowledge, attitudes and prevention of HIV for the public by way of educational videos [24].

Methods

Setting

The research took place in a 250 bed hospital, one of the two public hospitals in Ecuador, in the hospital lobby during one twelve-hour workday. The hospital has a total of 25 beds on the unit studied. The hospital policy requires the use of standard precautions. There are 75 total staff members who work on the unit.

Procedure

The researcher recruited health professionals in the lobby of the hospital and asked if they worked on a medical surgical unit. The participants all worked on a medical surgical unit where HIV patients have been hospitalized. The researcher first established with the unit manager support for the subjects time to participate in the research study. The researcher then established if the participants were health professionals through questioning the potential participants and observing the hospital uniform style of dress. The author chose only one unit because of time constraints in the travel to South America.

The research was conducted in the lobby in order to recruit subjects before they entered their unit, and, a number of small rooms were available next to the lobby which provided privacy for the subjects as they responded to the questionnaires. A weakness of this procedure is that it limited the sample to those who were willing and had time to fill out the questionnaire.

Participants

This cross-sectional descriptive study which took place in the year 2013, used a convenience sample consisting of thirty seven health professionals: nurses (n=21), physicians (n=5), physical therapists (n=5) and laboratory personnel (n=6) from a hospital in Ecuador, South America. All participants were residents of Ecuador, Ecuador. All of the participants provided direct patient care. Participants were required to be eighteen years of age in order to participate in the study.

After informed consent was obtained, four questionnaires were distributed to participants, and, upon completion, were collected by the researcher. The researcher remained in the lobby area during the study for any potential questions in order to provide clarification. The questionnaires were administered to health professionals who chose to participate after being informed about the research study both verbally and in writing. The participants were assured that their participation in the study was both voluntary and confidential, and informed consent was obtained. The researcher remained present during the study and available for any questions, no time constraints were established. However, most subjects took 30 to 45 minutes to complete the questionnaires. The researcher thanked the participants and collected the questionnaires as they left the research lobby area.

Instrument

All the participants first language was Spanish, all participants spoke English. The instruments were first developed in English. However, to assure clarity, the instruments were developed in Spanish. The instruments were converted to Spanish by a Spanish faculty member and by a nursing faculty member, both of whom were fluent in both Spanish and English.

The instruments were developed by the researcher and used in previous research studies conducted by the researcher [26-29]. Quantitative data were collected through the use of the following instruments: (1) HIV Education Information Questionnaire, (2) HIV Knowledge Questionnaire, (3) HIV Health Care Belief Scale, and (4) Demographic Information Questionnaire.

Demographic Information Questionnaire

This questionnaire requested the following information: the size of the community where the subject presently lives and was raised; gender, age; level of education (from post secondary degree, associate degree, bachelor's degree to graduate degree); and religious affiliation.

HIV Education Information

The HIV Education Information Questionnaire contained 20 questions about sources contributing to the subject's knowledge about HIV (magazines, books, radio, television, friends, colleagues, family, health network, family planning, physician, in-service training, and newspaper). These questions were developed by the researcher using two sources: the Health Interview Survey HIV Knowledge and Attitudes from the National Center for Health Statistics developed by

Dawson et al. [29] and the HIV Action Committee Survey developed by Wertz, Sorenson, [30]. These questions were also used by this researcher in other studies [26,27,31].

Sorenson, [30]. These questions were also used by this researcher in other studies [26, 27, 31].

Following those 20 questions was a question regarding whether they attended an HIV information session in the past year. If so, respondents were asked to state to what extent the following topics were discussed: HIV symptoms, HIV transmission modes, care of the HIV+ patient, precautions when handling blood and blood products, precautions to be taken when handling body secretions, precautions to be taken when handling body fluids, how to avoid self-infection. Subjects ranked these statements from “a good deal”, to “some” or “not at all” or “not applicable”.

Following this section, one question asked: “What do you believe are the chances you or your immediate family will contract HIV”? Subjects ranked this “A good chance”, “Some chance” or “no chance”. Four questions followed to address (1) if they personally knew anyone who has contracted HIV (3), if they had administered care to anyone with HIV over the past year, and (4) if they were concerned about taking care of clients with HIV. Subjects ranked these questions from “no one”, “1-5 persons”, “6-10 persons”, “11-15 persons” and “more than 15 persons.”

HIV Knowledge Questionnaire

HIV knowledge refers to information about how HIV is transmitted. HIV knowledge was determined by the scores on the HIV Knowledge Questionnaire. A higher score means more knowledge. In order to evaluate internal consistency, for the previous evaluation of the HIV Knowledge Questionnaire, the Kuder Richardson formula 20 was used. All items were collapsed to result in dichotomous data. The reliability coefficient was 7061 [27]. There were a total number of 34 questions.

Twelve of the questions with response choices of “very likely”, “possibly but unlikely” and “very unlikely” on the HIV Knowledge Questions were basic questions about contracting the HIV virus. Samples of the questions include “Given what you know about HIV how likely is it that it can be transmitted by sneezing, emptying bedpans, touching equipment, shaking hands, sharing coffee, touching bed sheets, giving mouth to mouth CPR, doing laundry, being in the same room.”

Nine questions with response choices of “always necessary”, “sometimes necessary”, “rarely necessary”, and “don’t know” included “How necessary do you think the following practices are in preventing the transmission of HIV: using blood borne precautions, wearing masks, gloves, eye wear, hand washing, special handling of body fluids, isolation of the room.”

Thirteen questions with response choices of “true”, “false” and “don’t know” included questions on whether HIV is caused by a virus, whether HIV can cripple the body’s natural protection against other diseases, whether HIV is especially common older people, and whether HIV leads to death. Examples are “You can tell if people are HIV+ by looking at them”, “a positive test for HIV means they will soon show symptoms”, “any person can pass the HIV+ through sexual intercourse”, “a pregnant woman who is HIV+ can give the virus to

her baby”, “there is a vaccine that protects people from HIV”, “there is no cure for HIV”, “you can get HIV from eating in a restaurant where the cook has HIV”, “you can get HIV from sharing plates, forks, glasses with someone who is HIV+”, “you can get HIV from toilets” and “you can get HIV from attending school with a person who is HIV+”. These questions from the original questionnaire remain appropriate questions for this study.

For all items in the questionnaire, 1 point was given for each correct response and 0 points for an incorrect response. Total possible scores ranged from 0 to 34. A higher score means more knowledge. A passing score was considered to be 26 or more correct (76% or more). This score is a common pass rate for health professions.

To examine attitudes, an additional three multiple choice questions were asked: would you refuse to work with an HIV patient would you choose to care for an HIV positive patient, and, how competent do you feel in caring for an HIV patient. To examine adherence to standard precautions, procedures regarding needle disposal and necessity of the use of gloves were asked.

HIV Health Care Belief Scale (AHCBS)

The original Health belief model was developed by Rosenstock [32]. Functional properties of the HIV HCBS consisted of five concepts which were measured. This scale was adapted from the “Breast Self Examination Scale” which was developed by Champion [33] and further developed by this researcher [26,27]. The scale contains 40 statements regarding health care beliefs about AIDS. In addition, there were 7 items related to self efficacy adopted from Horan, et al. [34]; an additional 3 items developed by the researcher which evaluated ethical orientation, and 4 items which evaluated moral sophistication.

In previous studies regarding HIV in the United States, conducted by this researcher, (Author 1990; Author 1998), psychometric analysis of the HIV Health Care Belief Scale was performed. For the AIDS Health Care Belief Scale, Cronbach’s alpha was determined. Total reliability for the Health Care Belief Scale was 83.

The HIV Health Belief Scale includes 6 items regarding perceived susceptibility (1-6), 12 questions about perceived seriousness (7-18), 6 questions pertaining to perceived benefits (19-24), 9 questions related to perceived barriers (25-33), and 7 questions related to perceived health motivation (34-40). In addition, 7 questions adapted from Horan et al. (1998) for the concept of perceived self efficacy (41-47). Three questions created by the researcher (48-50) measure perceived ethical orientation and 4 questions (51-54) measured perceived moral sophistication and were created by the researcher.

Reliability of Instruments

In a previous study, Psychometric analysis of the HIV Knowledge Questionnaire and HIV Health Care Belief Scale was performed. To evaluate internal consistency of the HIV Knowledge Questionnaire, the Kuder Richardson formula 20 was used. For the HIV Health Care Belief Scale, Cronbach’s alpha was determined.

Previously, an initial reliability coefficient for the HIV Knowledge Questionnaire was computed using Kuder Richardson formula 20. Thirty four knowledge items were included in the analysis. The reliability coefficient for internal consistency for the AIDS Knowledge Questionnaire was .7061.

A total of 54 items were included on the HIV Health Care Belief Scale using Cronbach's alpha. The internal consistency of each of the subscales was evaluated to establish reliability. Total reliability for the health care belief scale was 83.

Health Belief Concept Definitions

Perceived susceptibility is defined as a person's own estimated subjective probability that he or she will encounter a specific health problem (HIV) and that the disease is severe in its present or future ramifications. According to Rosenstock, et al. [32, 35], it is the subjective risk of contracting a condition.

Perceived seriousness is defined as the degree of emotional arousal (perceived threat) that the thought of HIV can cause or by the entanglement that health professional believes a given health condition would constitute. Perceived seriousness is an important factor in influencing behavior [36].

Perceived benefits are defined as the benefit of the preventive health measure and beliefs about the effectiveness of recommended preventive actions which appear to be important determinants of health protecting behavior. In this study, the perceived benefits are those of using standard precautions as means to reduce the threat of contracting HIV.

Perceived barriers are beliefs about the barriers or costs associated with taking action. An action was thought to be more likely where, in the presence of a threat (in this case, contracting HIV) the use of universal precautions is seen as efficacious and possible at a tolerable cost to the health care provider.

Perceived health motivation is the desire to attain or maintain a positive state of health and the intention to comply with positive health activities.

Perceived Self efficacy refers to the conviction that one can successfully execute the behavior required to produce the outcome, the confidence to carry out the skills and knowledge of the use of standard precautions to avoid contracting HIV [34,35].

Perceived Ethical orientation refers to the values relating to conduct with respect to the rightness or wrongness of certain actions and to the goodness or badness of the motives and ends of such actions [37].

Perceived moral sophistication refers to generally accepted customs of conduct and right living in a society and to the individuals practice in relation to these [38].

The AHCBS participants ranked their level of agreement on a 5-point Likert scale responding to each statement with "strongly agree" (5), "agree" (4), "neutral" (3), "disagree" (2), and "strongly disagree" (1). Total possible scores for susceptibility range from 6 to 30; seriousness 13 to 65; benefits 6 to 30; barriers, 9 to 45; health motivation, 7 to 35; self efficacy, 7 to 35; ethical orientation 3 to 15; and moral sophistication 4 to 20.

For perceived susceptibility, seriousness, benefits, barriers, health motivation, self efficacy, a higher score means stronger perceived susceptibility, stronger beliefs about these concepts. For perceived ethical orientation, and moral sophistication, a lower score means stronger ethical orientation and stronger moral sophistication.

Results

Data were analyzed using SPSS (Statistical Package for Social Sciences) for Windows (version 12.0). Descriptive statistics were used to describe the demographic characteristics, participant's health beliefs, and knowledge about HIV/AIDS.

Sample Characteristics

Thirty seven health professionals participated: nurses ($n=21$); physicians ($n=5$); physical therapists ($n=5$); and laboratory personnel ($n=6$). They ranged in age from 20 to 54. The mean age was 31. Most of the participants were female ($n = 31, 84\%$). Most of the participants ($n=34, 92\%$) lived in a community of a population under 12,000. Most ($n=33, 90\%$) obtained their information about HIV from various sources, most of 12.1 which included college classes, textbooks, and television. Most of the participants ($n = 30, 81\%$) were Roman Catholic. Forty nine percent of subjects ($n= 18$) had baccalaureate degrees (this was the highest degree reported). There was 100% response rate. 12.2.

HIV Education Information

Most of the subject's resources regarding HIV transmission were obtained from college classes, books and the media ($n= 23, 62\%$). Many had not attended an information session regarding HIV in the past year ($n= 26, 70\%$).

More than half of the participants ($n = 20, 54\%$) believed that their family would contract HIV. Older participants, those between 40 and 54 years of age ($n = 7, 57\%$), preferred not to care for or were not sure if they wanted to care for an HIV patient. Younger participants, those between 20 and 39 years of age ($n = 30, 57\%$), preferred not to care for or were not sure if they wanted to care for an HIV patient. Age in this study, did not seem to matter with most subjects preferring not to care for HIV patients, unlike other studies who found older subjects were more likely to have positive attitudes [21].

Of the participants who were Roman Catholic, ($n=14$) 40% would not or were not sure if they would work with HIV+ patients. These results are consistent with those from other studies where participants were found to have judgmental attitudes toward patients with HIV [9,14,31, 39-41].

Perceived Knowledge about HIV

Using 76% as an average pass rate on the knowledge survey, there was only one participant who had a passing score. The questions most frequently missed by participants related to the use of shoe protection to prevent transmission of HIV, ($n= 18, 48\%$) the quarantine of a patient's room to prevent the transmission of HIV ($n= 22, 59\%$), gloving practice to prevent the transmission of HIV, ($n=19, 51\%$) how likely is it HIV can be transmitted by giving CPR, ($n=29, 78\%$) how necessary is it to have eye protection to prevent the transmission of HIV ($n= 30, 81\%$). This is consistent with other research results which indicate health personnel do not have correct knowledge about HIV transmission [16,28,42,43].

Multiple Choice Questions: Examining Adherence to Standard Precautions

Three multiple point questions examined specific opinions. Most

participants ($n=19$, 52%) were unsure or chose not to work with HIV + patients. Most participants ($n=20$, 54%), felt competent to care for an HIV patient, and most ($n=21$ (56%) participants would refuse to care for an HIV client. These findings are similar to previous research studies that found negative attitudes and inadequate knowledge among medical professionals regarding HIV [16, 19].

Perceived Health Beliefs about HIV

Self-efficacy score results indicated most participants have confidence in the use of universal precautions as a prevention measure. These results indicated confidence in the use of universal precautions to avoid contracting HIV. Scores on the *moral sophistication* concept indicated subjects were not offended by people who are HIV +. Among the participants, 52% would not choose to care for an HIV + patient or were unsure if they would care for an HIV + patient.

In the *perceived benefit* section of the survey, in response to the question "knowing how to use universal precautions prevents future problems for me in contracting HIV", most of the participants ($n=36$, 97%) believed that using this method of prevention would prevent them from contracting the HIV virus.

Most participants did not believe that they were susceptible to contract HIV. Fifty five percent of participants perceived HIV as a *seriousness* disease. Of the participants, ($n=35$, 96%) believed the use of universal precautions is a benefit in the prevention of the transmission of HIV. Most participants ($n=26$, 72%) believed there were no *barriers* in the use of universal precaution. Most respondents ($n=31$, 86%) indicated they are *motivated* to be in a positive state of health. Ninety seven percent of respondents had high perceived *self efficacy* scores indicating confidence in the use of universal precautions to avoid contracting HIV. Most of the participants' ($n=23$, 64%) *ethical* response was they would not choose to care for people who are HIV + in preference to other types of ill patients, however they were not morally offended by people who are HIV +.

Discussion

Over the past 25 years the number of HIV cases has been increasing steadily in Ecuador [5]. In the year 2013 a significant increase in the number of HIV cases was reported most likely due to the implementation of HIV testing. Ecuador suffers from a lack of research findings concerning HIV and the limited information available differs from the official statistics released by the Ministry of Public Health of Ecuador (2009).

The first study conducted in Ecuador focusing on HIV knowledge in companies was conducted in 2013 (Cabezas, et al.) It was noted that most studies implemented in other Latin American countries with similar socioeconomic profiles as Ecuador were conducted in health care institutions among healthcare workers. For example researchers in Chile, studied HIV knowledge and occupational risks in primary care health workers. They reported that 63.8% of health care workers had an appropriate level of knowledge which is a higher level than this research study.

It is important to consider health beliefs as factors which influence patient care. The results of this study provided further affirmation that health professionals viewed HIV as a very serious disease and were confident about the use of standard precautions to prevent transmission of HIV. Respondents' to high confidence that the use of standard precautions to avoid contracting HIV is encouraging, as

results from other studies found health care workers used standard precautions inconsistently [44].

As noted, most of the participants (64%) would not choose to care for people who are HIV + in preference to other types of ill patients. However, participants were not morally offended by people who are HIV +. Forty percent of participants in this study were Roman Catholic, so this finding could potentially be associated with religious beliefs. Religion may play a role in a health professional's choice of patients, however, given the small sample size, this is difficult to conclude with confidence.

Although most of the participants believed it was necessary to use standard precautions, 30% ($n=11$) thought it was not always necessary to use them. Participants in this study showed a general lack of knowledge about HIV/AIDS transmission.

Similar to previous research [45] the findings suggest that health care workers in this setting lack knowledge about HIV transmission. The source of information about HIV transmission in this subject group was varied. Subjects appear to have confidence about the use of universal precautions as a method in which to prevent transmission of HIV.

Limitations

The study results provide direction and focus for applicable interventions. However, the generalizability of the study findings is limited due to the use of convenience sampling, the small sample size and the specific nature of the participants' specialty area. The procedure method used did not allow for everyone to be surveyed. Only those health professionals who worked on the day shift the day the research was conducted were included here.

The study findings, however, seem to be fairly representative of the health professionals who are employed in the hospital setting. Participants from various health professions may have decidedly different attitudes and knowledge about caring for patients related to the depth of their curriculum while in school, their experience with caring for HIV positive patients and family members. The study relied on self reported data. The data then, may be subject to bias. The use of a cross sectional design limited the ability to make causal inferences. Nonetheless the findings clearly identify knowledge deficits and negative behaviors in this study group.

Recommendations for Future Research

This study used a convenience sample and was of a very small size. Future research should use a purposeful sample of larger size. In addition, according to the results of this study, there was a lack of knowledge about HIV transmission in this cohort of health professionals. Findings from this study support a need to encourage efforts to educate health professionals about HIV transmission in Ecuador in a structured, collegial educational setting. This method of study will assist to provide accurate and consistent information using evidenced based sources for student learning. Research is warranted in the area of how conducting in-service sessions regarding HIV transmission will assist health professionals to keep current on the evidenced based research about disease transmission.

Further, attitudes of health care professionals need to be examined in relation to their willingness to care for HIV + patients. Further research is needed to determine how nurses in Latin America

and around the globe may influence the proper use of standard precautions. Researchers must continue to find methods through research in which to promote health professionals willingness to care for HIV+ patients.

Conclusion

In general, the findings of this study revealed a gap of knowledge as well as the prevailing negative attitudes of health professionals towards patients with HIV. Health professionals must be knowledgeable about and aware of erroneous attitudes and beliefs about disease transmission. A special focus on the value of human life may be helpful to promote the development of health beliefs which foster support for the human condition. These results, however, can hardly be extrapolated to larger populations of health professionals in Ecuador. However, continuing to make efforts to educate regarding HIV knowledge has been known to change behaviors.

It is important to continue this research for health care providers globally and, specifically, in Ecuador and throughout Latin America. Educational efforts in schools need to focus on the use of standard precautions and address health professionals concerns and issues related to the HIV positive patient.

For this study, the opportunity to expose the subjects to this survey alone may have played a role in changing attitudes. Taking the survey may have made the subjects more aware of their own opinions about patients with HIV, and to increase standard precaution awareness, and adherence. Subjects potentially may have had meaningful discussions on what their attitudes were about toward HIV patients and perhaps decreasing their avoidance of HIV patients.

Training of standard precaution guidelines is one of the most important ways to prevent transmission of disease. It was noted that most of these subjects in this study had no update on standard precautions in the past year. This study calls for a focus on adherence to the standard precaution guidelines in order to provide better patient care and a safer work environment.

Competing Interests

The author declare that she has no competing interests.

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