

## **PHOTOCOPY AND USE AUTHORIZATION**

In presenting this thesis in partial fulfillment of the requirements for an advanced degree at Idaho State University, I agree that the library shall make it freely available for inspection. I further state that permission for extensive copying of my thesis for scholarly purposes may be granted by the Dean of the Graduate School, the Dean of my academic division, or the University Librarian. It is understood that any copying or publication of this thesis for financial gain shall not be allowed without my written permission.

**Signature** \_\_\_\_\_Aysha Zahidie\_\_\_\_\_

**Date** \_\_\_\_\_29<sup>th</sup> Nov 2023\_\_\_\_\_

Attitudes toward People Living with HIV/AIDS and Willingness to Provide  
Care among Health Sciences Students at a Public University in the Mountain West Region

by  
Aysha Zahidie

A thesis  
submitted in partial fulfillment  
of the requirement for the degree of  
Master of Public Health in the Department of Community and Public  
Health Idaho State University  
Fall 2023

## Committee Approval

To the Graduate Faculty:

The committee members appointed to examine the thesis of AYSHA ZAHIDIE find it satisfactory and recommend that it be accepted.

---

Kristin Van De Griend  
Thesis Supervisor

---

Nnamdi Moeteke  
Thesis advisor

---

David Hachey  
Committee Member

---

Ryan Lindsay  
Committee Member

---

John Holmes  
Graduate Faculty Representative

## Dedication

*I dedicate this humble effort to my beloved father “Taufiq Ahmed Zahidie.”*

*I am fortunate to take all my intellectual endeavors under his blessings*

*To my mother “Safia Nigar”*

*For her unconditional love, support, and care*

*To my sister, “Fatma Zahidie”*

*For always being there for me through thick and thin*

*To my husband, “Syed Wasif Hussain”*

*For helping me out, growing in my resilience*

*To my only daughter, “Zahra”*

*Her presence brings joy to my life, and I owe her deeply for bearing with me during the intense  
course times*

*To my teachers at Idaho State University*

*For trusting in me, supporting and helping me to reach my career and graduate program dreams*

*&*

*To the health sciences students of Idaho State University*

*For whom I undertook this project and through whom it was accomplished!*

## Acknowledgments

I deeply acknowledge Dr. Kristin van De Griend, Assistant Professor, Department of Community and Public Health, Idaho State University (ISU), for her continuous supervision, support, guidance, and valuable feedback throughout the process of conception of the research question, proposal writing, tool development, data collection, analysis and the final write-up of this study. She is a fantastic person to work with and, undoubtedly, has been the best mentor I have come across so far!

I sincerely appreciate Dr. Nnamdi Moeteke, Visiting Assistant Professor at ISU, for his brilliant epidemiological and statistical skills, guidance in improving the proposal methodology, and helpful advice on statistical analysis for this research work.

I am grateful for the continual feedback and comments from Dr. John Holmes, Assistant Research Professor of Pharmacy Practice and Family Medicine at ISU. He has also been instrumental in facilitating the data collection from the target population.

I would also like to thank Dr. Ryan Lindsay, Chair / Associate Professor Department of Community and Public Health, and Professor David Hachey, Pharmacy Clinical Services Director, Pharmacy Attending HIV & Hepatitis C, for their support, guidance, and input in designing and analyzing the study. I am also thankful to Lee Ann Waldron, Senior Director of Marketing & Communications - Idaho State University Kasiska Division of Health Sciences, for her help in getting contact lists for data collection tool dissemination electronically. I extend my utmost gratitude to all the research participants for their participation and cooperation.

## TABLE OF CONTENTS

List of Figures.....	vi
List of Tables.....	vii
List of Abbreviations.....	viii
Abstract.....	ix
CHAPTER Introduction.....	1
Background.....	1
Study objectives.....	2
Approach.....	2
Study hypothesis.....	2
Theoretical construct .....	3
Study variables.....	3
Significance.....	3
CHAPTER II: Literature Review .....	4
Health-related theories most relevant to this research topic and a conceptual model.....	5
CHAPTER III: Methods.....	8
CHAPTER IV: Results.....	11
CHAPTER V: Discussion.....	24
Strengths and limitations.....	26
Conclusion.....	27
Recommendations.....	27
References.....	29
Appendix.....	34

## List of Figures

Figure 1	Flowchart for behavior change in the Precaution Adoption Process Model .....	5
Figure 2	SCT factors explaining the behavior change motivation.....	6
Figure 3	Model-based reflection of the constructs of knowledge, attitudes, and motivation.....	7

## List of Tables

Table 1	Socio-demographic characteristics of the study participants (n=175) .....	11
Table 2	<i>Attitudes</i> toward PLHIV among the study participants (n= 165) .....	13
Table 3	<i>Willingness</i> to provide clinical care to a patient diagnosed with HIV among the study participants (n=159) .....	16
Table 4	Association between participants' socio-demographic characteristics and <i>Attitude</i> toward PLHIV(n=165) .....	18
Table 5	Association between participants' socio-demographic characteristics and <i>Willingness</i> to provide care to PLHIV (n=159) .....	19
Table 6	Association between participants' socio-demographic characteristics, <i>Attitudes</i> , and <i>Willingness</i> scores to provide care to PLHIV (n=165) .....	21
Table 7	Multivariable logistic regression model showing association of positive <i>Attitude</i> versus negative <i>Attitude</i> .....	22
Table 8	Multivariable logistic regression model showing association of high versus low <i>Willingness</i> high <i>Willingness</i> versus low <i>Willingness</i> .....	23



## List of Abbreviations

CDC	Centre For Disease Control & Prevention
HIV	Human Immunodeficiency Virus
HIV/AIDs	Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome
ICN	International Council of Nurses
IQR	Interquartile Range
ISU	Idaho State University
NPs	Nurse Practitioners
PAs	Physician Assistants
PLHIV	People Living With HIV
SD	Standard Deviation
STIs	Sexually Transmitted Infections
US	United States of America
WHO	World Health Organization

Attitudes toward People Living with HIV/AIDS and Willingness to Provide Care among Health  
Sciences Students at a Public University in the Mountain West Region  
Thesis Abstract--Idaho State University (2023)

Endemic diseases such as viral hepatitis, HIV, and other sexually transmitted infections affect masses at a large scale in the United States and exacerbate interstate and interracial health disparities all over the country. This situation warrants the development of an auxiliary healthcare workforce with quality education and training to share the burden of physicians in health facilities and champion the cause of prevention and control of infections in community settings. This study aimed to assess attitudes toward people living with HIV (PLHIV) and their willingness to provide care and determine factors associated with attitudes and willingness among health sciences and allied professions students.

The study population for this cross-sectional survey included undergraduate (first through the final year) and graduate students of health sciences and allied disciplines at a public university in the Mountain West. Data was collected using validated tools from September 1-30, 2023. All health sciences students were invited. However, those with prior clinical experience outside their respective program of study were excluded.

Socio-demographically, the majority of the respondents were females (84%),  $\leq 35$  years of age (93%), and of non-Hispanic origin (83%). Around 83% were undergraduate students, and most were in nursing majors (36.6%). The majority of students lived in off-campus housing (84.4%) and had an upbringing in rural (43%) or semi-urban areas (33%). Academic courses at Idaho State University (ISU) were the primary source (51%) for learning about HIV and AIDS. The Chi-square analysis revealed associations between the respondents' *Attitudes* and age ( $p = 0.002$ ), year in school ( $p = 0.07$ ), and primary geographic upbringing ( $p = 0.04$ ). The *Willingness* category was associated with the study major at ISU ( $p = 0.004$ ), year in school ( $p = 0.010$ ), and type of housing ( $p = 0.125$ ). Higher mean *Attitude* scores indicated negative *Attitudes*, while higher mean scores for *Willingness* indicated high *Willingness* to provide clinical care to PLHIV. In the t-test analysis, those aged  $\leq 35$  had significantly higher mean scores for *Attitude* than those aged  $> 35$  years ( $p = 0.01$ ). Males were likelier to score higher than females ( $p = 0.04$ ) in *Willingness* to provide care. Undergraduate students and students in nursing majors had significantly higher *Willingness* scores

( $p = 0.076$  and  $0.005$ , respectively) than their counterparts. Students in graduate years of schooling and those living off campus scored lower on *Willingness* ( $p = 0.186$  and  $0.023$ , respectively).

The binomial logistic regression model predicting negative *Attitude* showed that compared to age  $\leq 35$  years, those  $> 35$  years had significantly lower odds of a negative *Attitude* (OR=0.13, p-value 0.014). Compared to those in the first year of undergraduate education, students in higher undergraduate years had significantly lower odds of negative *Attitudes* (OR=0.32, p-value 0.024). Similarly, compared to those with a primary upbringing in rural areas, urban upbringings were associated with significantly lower odds of a negative *Attitude* (OR=0.25, p-value 0.012). In terms of *Willingness*, it was shown that compared to those in the first year of undergraduate education, students in higher undergraduate or graduate years had significantly lower odds of high *Willingness* (OR=0.43, p-value 0.12) and (OR=0.21, p-value 0.01), respectively.

This research project helps identify gaps in the *Attitude* and *Willingness* of health sciences students to provide clinical care to PLHIV, based on which insightful curricular interventions are recommended for consideration by curriculum review committees. This study also provides baseline data for any future research and interventions.

**Keywords:** Curriculum, HIV, Willingness, Clinical care, Attitude

## **Chapter I: Introduction**

*“This journey of education and breaking the stigma around HIV will have a legacy everlasting.”*

– Gareth Thomas.

### **Background**

In the United States (US), infectious diseases still pose a significant threat to the population's health and continue to place a massive demand on healthcare resources. Endemic diseases, such as HIV, other sexually transmitted infections (STIs), and viral hepatitis, affect millions of individuals and exacerbate interstate and interracial health disparities nationwide (Cloeckaert et al., 2020). Infectious diseases have emerged with new momentum and faster spread owing to rising international travel and tourism and overall population growth, especially among the elderly. At the policy level, Idaho is included among those states where an infected person can face a trial from the criminal justice system for the charges of intended transmission of HIV to others (Centers for Disease Control and Prevention [CDC], 2023). In 2015, Idaho was placed 43<sup>rd</sup> among the 50 states in terms of the number of newly diagnosed HIV cases. The incidence of primary and secondary syphilis increased from 0.8 per 100,000 in 2011 to 3.5 per 100,000 in 2015. Idaho now ranks 35<sup>th</sup> in rates of people acquiring syphilis. During 2011 - 2015, reported cases of acute hepatitis B increased by 400% (State et al., 2017). This places a considerable strain on the health workforce. Potentially overworked primary care teams in the country are faced with the influx of newly emerging infections on the one hand and the burden of existing infectious diseases due to people chronically living with HIV and antibiotic resistance on the other (Salsberg et al., 2017). This situation warrants practical and innovative solutions such as developing an auxiliary healthcare workforce with quality education and training in infection control and prevention for team-based approaches in health facilities and championing prevention and control of infections in community settings.

It is plausible that with the standardization of care regimens for infectious diseases like HIV and hepatitis, some of the role and workload of primary care physicians can be shared by allied health workers such as nurse practitioners (NPs), physician assistants (PAs), and pharmacists, decreasing the demand for infectious disease physicians (Bosh et al., 2021). For example, NPs and PAs can assist with patient follow-up care, allowing primary care physicians to focus on more complicated patient care needs, and pharmacists could assume responsibility for stewardship in preventing and controlling infections in the facilities. Sustainable development of

the qualified and competent infectious diseases workforce will require high-quality education delivered through professional academic programs in health sciences both at undergraduate and postgraduate levels. Quality education and skill development will help health sciences graduates grow as champions in preventing and controlling infectious diseases at the community and population level and simultaneously combat emerging threats of new infections. While various modules are taught on the prevention and control of infectious diseases, along with some insight on essential tools of public health for understanding disease dynamics and implementation of prevention strategies, there is no standardized, comprehensive curriculum for students in health and allied disciplines (Jeffres et al., 2019). Research has already indicated that besides the adequate training of the providers, the quality of healthcare services is also influenced by a range of factors that relate to healthcare providers' perceptions, personal factors, and the broader environment (Mosadeghrad, 2014). To improve healthcare service quality, adopting a range of measures that promote effective service provision through adequate training and knowledge on the subject and by improving attitudes, willingness to serve, and overcoming personal biases and stigmas is necessary.

This cross-sectional study is about the attitude of Health Sciences Students towards PLHIV and their willingness to provide care at a public university in the Mountain West Region.

#### Study objectives

- To assess the *Attitude* of health sciences and allied professions students towards PLHIV and their *Willingness* to provide care for them
- To determine factors associated with *Attitudes* towards PLHIV and *Willingness* to provide care among health sciences and allied professions students

#### Approach

This project was a cross-sectional study that was carried out using a questionnaire adapted from standardized, validated tools, e.g., The Healthcare Provider HIV/AIDS Stigma Scale (HPASS) (Wagner et al., 2014) and Nursing Willingness Questionnaire (NSQ) (Dubbett et al., 1994) to assess undergraduate and graduate students' attitudes and willingness to provide care. (Appendix)

#### Study Hypothesis

The study curriculum equips health sciences and allied students with better attitudes to care for PLHIV. It prepares them for the future role of preventing and controlling prevalent infections

at the community and facility level, evidenced by the difference in attitude and willingness to care among first-year undergraduate and senior undergraduate and graduate students.

### **Theoretical constructs based on the study hypothesis**

Theoretical constructs: There is a need to find out the adequacy of the current curriculum in engendering appropriate infectious diseases-related attitudes, perceptions, and willingness to care among undergraduate and graduate students to meet the demand for infectious diseases-related workforce at state, federal, and global levels.

### **Study variables**

<b>Independent variables</b>	<b>Dependent variables</b>
<ul style="list-style-type: none"><li>• Age</li><li>• Study major at ISU</li><li>• Year of study</li><li>• Type of housing arrangement</li><li>• Primary geographic upbringing</li><li>• Gender</li><li>• Race</li><li>• Ethnicity</li></ul>	<ul style="list-style-type: none"><li>• <i>Attitudes</i> toward PLHIV</li><li>• <i>Willingness</i> to provide clinical/nursing care to a patient diagnosed with HIV</li></ul>

### Significance

Considerable variability exists in the infectious diseases-related curriculum taught at various universities and various health science programs within a university, revealing a need for more standardization of academic instruction in this discipline (Jeffres et al., 2019). This might also explain the varying levels of attitudes and care provided to the patients by the health workforce. This study will explore the infectious diseases-related attitudes and perceptions of the health sciences and allied students. It would also explore the level of willingness to care for PLHIV among undergraduate and graduate students to meet the future demand for the infectious diseases-related workforce involved in care for people with infectious diseases such as HIV, STIs, or viral hepatitis.

Carrying out this research project has helped the researchers better understand the dynamics of health sciences-related curricula at the undergraduate and graduate levels. It has also enabled them to identify gaps in the curriculum based on which valuable recommendations have been developed for consideration by curriculum review committees.

## **Chapter II: Literature Review; An overview of the impact of infectious diseases related curriculum**

Viral hepatitis, HIV, and other sexually transmitted infections affect millions of individuals and contribute to human plight and existing health disparities (Khabbaz et al., 2014). These infectious diseases contribute to physical and mental health issues for the patients at the individual level and cause discrimination for those living with these conditions at the societal level. Unfortunately, after a long time since the detection of Kaposi's sarcoma and Pneumocystis pneumonia among men in Los Angeles and New York, HIV/AIDS and other STIs remain a global public health challenge (Tashiswaka, 2017). Research shows that the capability for data interpretation and risk assessment is the key to modern health literacy and is effective at promoting both the skills and self-efficacy related to combating diseases in a diverse healthcare workforce (Jacque et al., 2016; Frain et al., 2017; Spach et al., 2016). However, literature has also revealed that immunization policies and follow-up appointments for infectious disease exposures are still not up to the mark in the US associate degree and baccalaureate nursing programs; therefore, they need training and courses before being exposed to clinical settings. (Goetz et al., 1992)

As far as sexually transmitted infectious diseases are concerned, even medical undergraduate curricula have inadequate sexual health education content. A national telephone survey of undergraduate medical students showed that many US medical schools (44%) lack adequate instruction on sexual health. Almost half of the medical students were found to be hesitant about taking sexual histories from minors (17.4%) and the elderly (23.8%) (Malhotra et al., 2008). Similarly, a survey of infectious diseases curriculum among pharmacy schools in the US reflected concerns from the faculty over the lack of time available to cover material and the amount of material covered, stressing the consistency of infectious disease education and utilization of better educational techniques and innovations (Jeffres et al., 2019). These findings were similar to global data, in which variations were revealed in the content and quality of instruction about teaching infectious diseases among various pharmacy colleges (Alqahtani et al., 2021). Similarly, research has shown that increasing the quality of the infectious diseases-related curriculum can increase interest in infectious diseases careers among pharmacy students in the US (Gauthier et al., 2015). The Infectious Diseases Society of America and the Society for Healthcare Epidemiology of America have already recommended that there should be institution-level programs to improve infection control capabilities of clinical pharmacists through postgraduate training as there is

already a gap in demand and supply of adequately trained pharmacists in the country who could meet these requirements before being placed in core infection control teams (Jeffres et al., 2018).

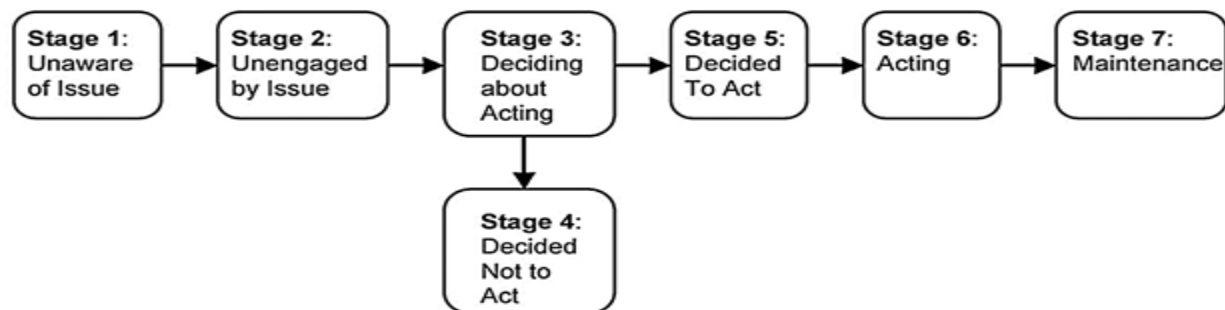
Global data reveals that targeted education improves student knowledge and attitudes toward infectious diseases (Wang et al., 2018; Jahanfar et al., 2009; Pickles et al., 2009). Extensive reviews on the behaviors of student nurses worldwide have revealed that, due to the lack of knowledge on HIV/AIDS, many student nurses were scared of contracting the disease and thus reluctant to get involved with the treatment of such patients (Pickles et al., 2009).

Recent literature, therefore, emphasizes the fact that to keep pace with the growing and newly evolving health challenges of this century, the training needs of the health workforce need to shift to include a better spectrum of infectious diseases curriculum at undergraduate levels for students in health sciences and allied disciplines (Rao et al., 2020). Moreover, evaluation and assessments are required for the redesigned educational structures and medical and allied curriculum-related reforms to the knowledge and behaviors of students. Such studies will help identify gaps and develop key quality improvement indicators in service delivery and workforce efficacy to combat infectious diseases at the facility and community levels (Patrick & Cadman, 2020). However, for incorporating relevant public health and infectious diseases content, strong institutional commitment through financial, logistic, and technical support to the educators and their structured training would be critical to success. (Abdul Kadir & Schütze, 2022; Younas et al., 2019).

- **Health-related theories most relevant to this research topic and a conceptual model**

The two theories that are closely relevant to the research objectives are:

The Precaution Adoption Process Model (PAPM): This theory explores phases of a person's voyage from lack of awareness to action and maintenance of certain behaviors and talks about the importance of providing knowledge and awareness that bring about conscious level changes in shaping a person's attitudes to different issues (Weinstein & Sandman, 1992).

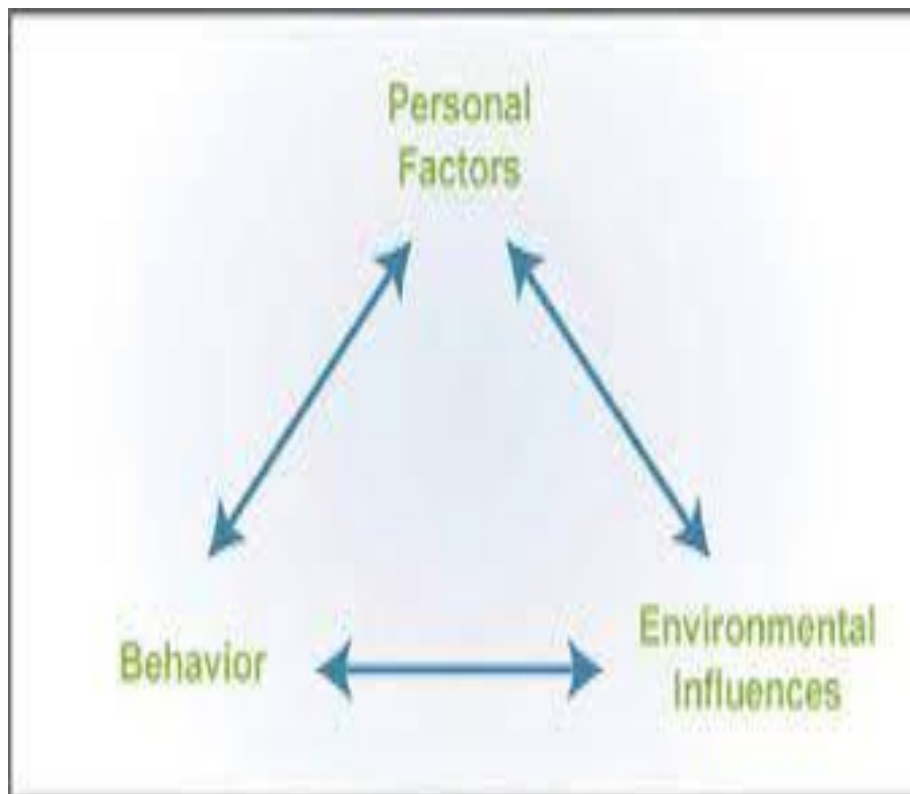


**Figure 1: Flowchart for behavior change in the Precaution Adoption Process Model**

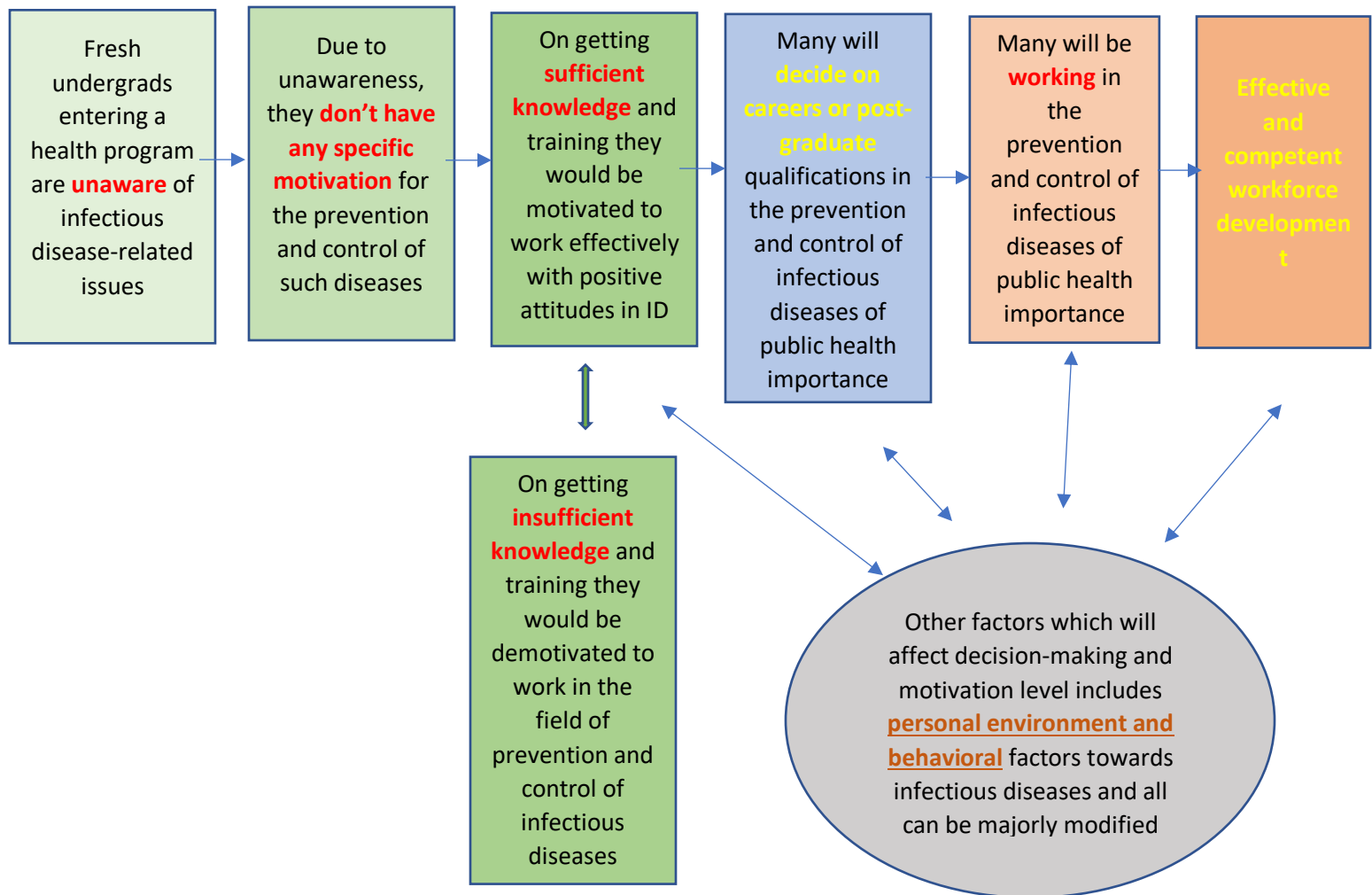


The Precaution Adoption Process Model suggests that behaviors can be modified if people are given knowledge about some issue. Acquired knowledge and awareness of infectious disease prevention and control through effective curricular interventions should guide students' perceptions, attitudes, and motivation toward this field, with a significant difference between fresh undergraduates versus final year or graduate students. If this is not the case, then the curriculum review is warranted.

**Social Cognitive Theory (SCT):** This theory describes “a dynamic, ongoing process in which personal factors, environmental factors, and human behavior exert influence upon each other.” (Bandura, 1986). According to SCT, three main aspects of human conduct mark the likelihood that a person will change a behavior: (1) self-efficacy, (2) goals, and (3) outcome expectancies. Individuals with a sense of self-efficacy can change behaviors even when met with hindrances and challenges (McLendon, 1966). In the SCT model, it is an individual's feeling of self-efficacy acquired through curriculum-based knowledge and environmental and social factors (might be stigma/taboo associated with infectious diseases).



**Figure 2: Factors that determine behavior change in the Social Cognitive Theory**



**Figure 3: Model-based reflection of knowledge, attitudes, and motivation constructs.**

*Adapted from PAPM by Weinstein & Sandman (1992) and SCT by Bandura (1986)*

## **Chapter III: Methods**

### **1. Research Design**

A comparative cross-sectional study assessed *Attitudes* and *Willingness* to care for PLHIV among first-year to final-year undergraduate and graduate students in Idaho State University health sciences and allied programs.

### **2. Data Collection Procedures**

Data were collected using a questionnaire-based survey tool disseminated to the participants electronically via Qualtrics. The participants first clicked the “Participant Information Document,” explaining the purpose of the study and mentioning that the participation was voluntary and confidential. After that, they viewed the “informed consent form.” Access was granted to the survey questions after the participants agreed to the terms and conditions on the consent form. The survey was a self-administered questionnaire, which took around 15 minutes to complete. Data collection was carried out for one month (September 1-30, 2023), after which the electronic link to access the data collection tool was deactivated.

### **3. Sampling**

All eligible participants were invited to participate in the survey using the equiprobability sampling technique by disseminating the study questionnaire to an estimated eligible population of 1619 students in the health sciences and allied disciplines. Because curricular education was the focus of this study, those with prior exposure to working in a clinical setting outside their program were excluded, as these educational experiences would likely confound *Attitude* and *Willingness* to care for PLHIV.

### **4. Subjects/Participants**

Participants were invited to participate in the study through emails. A list of the email addresses was acquired from the Student Services Department at ISU. Study participants included undergraduate and graduate students enrolled in health sciences and allied programs of Idaho State University in the departments of nursing, pharmacy, radiographic sciences, dental hygiene, etc.

### **5. Sample size**

Using OpenEpi software, a minimum required sample size (n) of 232 was calculated to conduct this study based on an estimated eligible student population (N) of 1619 and hypothesized % frequency of outcome factor in the population of 50%  $\pm 5$  at a confidence level of 90% and 80% power to detect the difference among study groups with 5 to 7 students expected in each group.

## 6. Study instrument

After thoroughly searching the literature, the survey tool was adapted from existing research tools. It includes sections on:

- A) *Demographic information and sources of knowledge on HIV and AIDS*
- B) *Attitudes toward PLHIV*
- C) *Willingness to provide clinical/nursing care to a patient diagnosed with HIV/AIDS*

In Section B, questions on *Attitudes* toward PLHIV were grouped as *Attitudes* around personal transmission risk, transmission risk towards others, comfort level with PLHIV, and general stigma.

In section C, participants were asked to assume a hypothetical scenario in which they were on a clinical posting in a hospital, and a male patient living with HIV was assigned to them during their shift. On reviewing the patient's medical record, they found that he had lived with a male companion for the last few years and was admitted due to HIV-related complications. He had elevated temperature, labored breathing, and heavy perspiration on examination. He had an IV drip and an external condom catheter in place. He had vomited and was stool incontinent. He also had an altered mental status. Both sections B and C of the questionnaire were scored using a Likert scale from 1 to 5.

## 7. Treatment of the Data

Electronically collected data on Qualtrics was downloaded as an SPSS data file and imported on *Jamovi*, a quantitative statistical software for checking the discrepancies, cleaning, and final analysis.

There were eighteen items in the *Attitude* domain. The five possible responses for each item ranged from “strongly disagree” to “strongly agree.” Scores for the possible responses for each item ranged from 1-5. The *Attitude* was categorized into ‘positive *Attitude*’ and ‘negative *Attitude*’ based on scores to the questions asked in this domain. Scores 1-2 were assigned to *Attitudes* reflecting positivity towards PLHIV, while a score of 3-5 reflected the negative *Attitude* for that item. Hence, the minimum possible total score was 18, while the maximum possible total score was 90 for participants who responded to all the items in the *Attitude* domain. Any total score above 36 reflected a spectrum of negative attitudes. Therefore, a cut-off total score of  $\leq 36$  was set as positive and above this as negative. Chi-square was performed for parametric data, and the Fisher exact test was employed where at least one cell counts less than five.

Similarly, *Willingness* was categorized into ‘high level’ and ‘low level’ based on scores to the questions asked in this domain. There were eleven items in the *Willingness* domain. The five possible responses for each item ranged from “strongly disagree” to “strongly agree.” Scores for the possible responses for each item ranged from 1-5. Based on the nature of the questions, scores 1-3 were deemed to reflect a low level, while a score of 4-5 reflected a high level of *Willingness* for that item. The lowest possible total score was 11, while the highest possible total score was 55 for a participant who responded to all the items in this domain. A total score of  $<44$  reflected a low level of *Willingness*, while an overall score of  $\geq 44$  was categorized as high.

## **8. Statistical Analyses**

Descriptive statistics were used to summarize the socio-demographics of the study population. The count and percentage were used to describe the data for categorical variables. The mean and standard deviation (SD) were used for continuous variables for the normally distributed data; the median, interquartile range (IQR), and range were reported for continuous data that were not normally distributed.

The chi-square test was performed for the categorical data that followed the assumptions of the parametric test, and the Fisher exact test was employed where data failed to fulfill the assumptions of normality. Mean scores related to the *Attitudes* and *Willingness* to care for PLHIV among groups stratified by age, study majors, year of study, type of housing, primary geographic upbringing, gender, race, and ethnicity were compared using independent sample t-tests and ANOVA for normally distributed data. Mann-Whitney and Kruskal Wallis tests were used to compare the parametric data's scores related to *Attitudes* and *Willingness*. Multivariable logistic regression was performed to find the association of *Attitude* and *Willingness* to the sociodemographic factors found to be significant in the Chi-square univariate analysis.

## **9. Ethical Concerns**

There were no personal identifiers on the study instrument. Instead, anonymous sequences (e.g., respondent 1,2,3) were used. Participants were assured that this research had no relationship with their academic work and that there would be no consequence if they declined to participate. The Idaho State University Institutional Review Board for Human Subjects Research approved all study procedures and protocols.

## Chapter IV: The Results

The response rate for this web-based survey was approximately 11%, and 76% (n=177) of the desirable sample size was achieved. Of these 177 respondents, 175 completed only the *Sociodemographic* information, 165 completed the *Sociodemographic* and *Attitude* sections, and 159 completed all three *Sociodemographic*, *Attitude*, and *Willingness* sections. As only an 80% confidence level could be achieved due to a relatively smaller sample size, a p-value  $\leq 0.1$  was considered significant for this analysis. All analyses were performed on *Jamovi* 2.2.5 statistical software.

### Sociodemographic Characteristics of Participants

The majority of respondents were females (84.0%), younger than 35 years of age (93.0%), non-Hispanic (83.0%), and had an upbringing in rural (43.0%) or semi-urban areas (33.0%). Around 83.0% were undergraduate students. Most respondents were in nursing majors (36.6%), followed by pharmacy (18.0%) and radiographic sciences (15.0%). Most students lived in off-campus housing (84.4%). Only half of the respondents (51.0%) reported that they had previously learned about HIV and AIDS through ISU academic courses (**Table 1**).

**Table 1: Socio-demographic characteristics of the study participants (n=175)**

<i>Socio-Demographic characteristics</i>	<b>n</b>	<b>%</b>
<b>Age</b>		
$\leq 35$ years	163	93.0
$> 35$ years	12	7.0
Mean (SD)	23.5(6.25)	--
Median (IQR)	21(19 – 25)	--
Range	(18 - 50)	--
<b>Study major at ISU (Multiple response)</b>	25	14.3
Dental Hygiene	5	3.0
Dietetics	<5	2.3
Medical Assisting	12	7.0
Medical Lab Science	64	36.6
Nursing	<5	1.0
Paramedic Science	31	18.0
Pharmacy	-	-
Physical Therapy	26	15.0
Radiographic Science	<5	1.7
Respiratory Therapy	6	3.4
Other		
<b>Year in school (Multiple response)</b>		
1 <sup>st</sup> -year undergraduate	37	21.0
2 <sup>nd</sup> -year undergraduate	33	18.6

<i>3<sup>rd</sup>-year undergraduate</i>	39	22.0
<i>4<sup>th</sup>-year undergraduate</i>	20	11.3
<i>4+ year undergraduate</i>	14	8.0
<i>1st-year graduate</i>	<5	2.3
<i>2<sup>nd</sup> year graduate</i>	-	-
<i>2+ year graduate</i>	<5	0.6
<i>PharmD year 1</i>	9	5.1
<i>PharmD year 2</i>	6	3.4
<i>PharmD year 3</i>	8	4.5
<i>PharmD year 4</i>	<5	2.3
<i>Other</i>	<5	0.6
<b>Type of housing</b>		
<i>Off-campus</i>	146	83.4
<i>On-campus</i>	29	16.6
<b>Primarily geographic upbringing</b>		
<i>Rural areas</i>	75	43.0
<i>Semi-urban areas</i>	58	33.0
<i>Suburbs of large cities</i>	23	13.0
<i>Urban areas</i>	19	11.0
<b>Gender</b>		
<i>Female</i>	147	84.0
<i>Male</i>	24	14.0
<i>Non-binary</i>	-	-
<i>Transgender female</i>	-	-
<i>Transgender male</i>	<5	1.0
<i>I do not want to reveal</i>	-	-
<i>My gender is (specify)</i>	<5	1.0
<b>Race</b>		
<i>American Indian or Alaskan Native</i>	<5	0.6
<i>Asian or Pacific Islander</i>	10	6.0
<i>Black or African-American</i>	6	3.4
<i>White</i>	143	82.0
<i>I do not want to reveal</i>	8	4.6
<i>Hispanic</i>	5	3.0
<i>Other</i>	<5	1.0
<b>Ethnicity</b>		
<i>Hispanic</i>	26	15.0
<i>Non-Hispanic</i>	145	83.0
<i>Other</i>	-	-
<i>Do not want to reveal</i>	<5	2.3
<b>Learning about HIV and AIDS (Multiple responses)</b>		
<i>Academic courses at ISU</i>		

<i>Academic courses at another university/Undergraduate Program</i>	84	51.0
<i>Academic courses in middle or high school</i>	9	5.5
<i>Family</i>	81	49.0
<i>Friends</i>	37	22.0
<i>Infectious disease websites (e.g., Centre for Disease Control)</i>	32	19.0
<i>News</i>	84	51.0
<i>Social media</i>	36	22.0
<i>The Internet</i>	47	28.5
<i>TV/movie/documentary/ programs</i>	86	52.0
<i>Other</i>	6	3.6
	5	3.0

### Level of *Attitude* of Participants towards PLHIV (n= 165)

In terms of *Attitudes* around personal transmission risk, around 21% of the students agreed that *people with HIV present a threat to their health*. Around 15% of the students accepted that *they would avoid conducting specific healthcare procedures on people with HIV*. Few of the participants also acknowledged a worry that *universal precautions are not reasonable enough to protect care providers from People with HIV*. Regarding *Attitudes* around transmission risk to others, around one-third of the students believed or stayed neutral to the statement that *they had the right to refuse to provide care/treatment to people with HIV for the safety of other patients*. Regarding comfort level toward PLHIV, some of the students also disagreed when asked *if one of their relatives who is HIV positive becomes ill, would you be willing to care for them in your house or community?*

On assessing stigma toward PLHIV, it was identified that around 40% of respondents held the idea that *people with HIV have engaged in risky activities despite knowing the risks* and almost half of the respondents agreed or stayed neutral to the statement that *people with HIV tend to have numerous sexual partners*. Most of the participants also agreed that *people who have acquired HIV through injection drug use were more at fault than those people who have acquired HIV through a blood transfusion*. (Table 2).

**Table 2: *Attitude* toward PLHIV among the study participants (n= 165)**

<i>Attitude variables</i>	n=165	%
<i>A) Attitudes around personal transmission risk</i>		
<b>People with HIV present a threat to my health</b>		
<i>Strongly disagree</i>	54	32.7
<i>Somewhat disagree</i>	46	28.0
<i>Neither agree nor disagree</i>	30	18.0
<i>Somewhat agree</i>	28	17.0



<i>Strongly agree</i>	07	4.0
<b>I would instead not come into physical contact with people with HIV</b>		
<i>Strongly disagree</i>	63	38.0
<i>Somewhat disagree</i>	33	20.0
<i>Neither agree nor disagree</i>	35	21.0
<i>Somewhat agree</i>	28	17.0
<i>Strongly agree</i>	06	3.6
<b>I would want to wear two sets of gloves when examining people with HIV</b>		
<i>Strongly disagree</i>	47	28.5
<i>Somewhat disagree</i>	33	20.0
<i>Neither agree nor disagree</i>	32	19.4
<i>Somewhat agree</i>	35	21.0
<i>Strongly agree</i>	18	11.0
<b>I would avoid conducting specific healthcare procedures on people with HIV</b>		
<i>Strongly disagree</i>		
<i>Somewhat disagree</i>	71	43.0
<i>Neither agree nor disagree</i>	46	28.0
<i>Somewhat agree</i>	22	13.3
<i>Strongly agree</i>	19	11.5
	07	4.0
<b>I worry that universal precautions are not reasonable enough to protect me from people with HIV</b>		
<i>Strongly disagree</i>	75	45.5
<i>Somewhat disagree</i>	53	32.0
<i>Neither agree nor disagree</i>	27	16.4
<i>Somewhat agree</i>	08	5.0
<i>Strongly agree</i>	02	1.0
<u>B) Attitudes around transmission risk to others</u>		
<b>I believe I have the right to refuse to provide care/treatment to people with HIV for the safety of other patients</b>		
<i>Strongly disagree</i>	74	45.0
<i>Somewhat disagree</i>	43	26.0
<i>Neither agree nor disagree</i>	21	12.7
<i>Somewhat agree</i>	20	12.0
<i>Strongly agree</i>	07	4.0
<b>People with HIV present a threat to the health of other patients</b>		
<i>Strongly disagree</i>	54	32.7
<i>Somewhat disagree</i>	51	31.0
<i>Neither agree nor disagree</i>	16	9.7
<i>Somewhat agree</i>	36	22.0
<i>Strongly agree</i>	08	5.0
<b>I would hesitate to send people with HIV to get blood work done for fear of others' safety</b>		

<i>Strongly disagree</i>	77	46.7
<i>Somewhat disagree</i>	47	28.5
<i>Neither agree nor disagree</i>	16	10.0
<i>Somewhat agree</i>	22	13.0
<i>Strongly agree</i>	03	2.0
<u>C) Comfort level towards PLHIV</u>		
<b>I would be comfortable working alongside another healthcare provider who has HIV*</b>		
<i>Strongly disagree</i>	03	2.0
<i>Somewhat disagree</i>	13	8.0
<i>Neither agree nor disagree</i>	22	13.0
<i>Somewhat agree</i>	57	34.5
<i>Strongly agree</i>	70	42.4
<b>I would rather see a patient who does not have HIV than one with HIV but has non-HIV-related concerns</b>		
<i>Strongly disagree</i>	60	36.4
<i>Somewhat disagree</i>	22	13.0
<i>Neither agree nor disagree</i>	54	33.0
<i>Somewhat agree</i>	24	14.5
<i>Strongly agree</i>	05	3.0
<b>I would feel uncomfortable knowing one of my colleagues is HIV-positive</b>		
<i>Strongly disagree</i>	83	50.0
<i>Somewhat disagree</i>	40	24.0
<i>Neither agree nor disagree</i>	16	10.0
<i>Somewhat agree</i>	20	12.0
<i>Strongly agree</i>	06	3.6
<b>If one of your relatives who is HIV positive becomes ill, would you be willing to care for them in your house or community? *</b>		
<i>Strongly disagree</i>	04	2.4
<i>Somewhat disagree</i>	04	2.4
<i>Neither agree nor disagree</i>	24	14.0
<i>Somewhat agree</i>	47	28.0
<i>Strongly agree</i>	86	52.0
<u>D) General stigma</u>		
<b>People with HIV have engaged in risky activities despite knowing the risks</b>		
<i>Strongly disagree</i>	17	10.3
<i>Somewhat disagree</i>	43	26.0
<i>Neither agree nor disagree</i>	39	23.6
<i>Somewhat agree</i>	58	35.0
<i>Strongly agree</i>	08	5.0
<b>I think many people with HIV likely have substance abuse problems</b>		
<i>Strongly disagree</i>	62	37.6
<i>Somewhat disagree</i>	33	20.0
<i>Neither agree nor disagree</i>	61	37.0

<i>Somewhat agree</i>	08	5.0
<i>Strongly agree</i>	01	0.6
<b>People with HIV tend to have numerous sexual partners</b>		
<i>Strongly disagree</i>	53	32.0
<i>Somewhat disagree</i>	30	18.0
<i>Neither agree nor disagree</i>	48	29.0
<i>Somewhat agree</i>	27	16.4
<i>Strongly agree</i>	07	4.0
<b>I often think people with HIV have caused their health problems</b>		
<i>Strongly disagree</i>	66	40.0
<i>Somewhat disagree</i>	50	30.0
<i>Neither agree nor disagree</i>	32	19.0
<i>Somewhat agree</i>	14	8.5
<i>Strongly agree</i>	03	2.0
<b>People with HIV who have acquired HIV <u>through injection drug use</u> are more at fault for contracting HIV than people with HIV who have acquired HIV through a blood transfusion</b>		
<i>Strongly disagree</i>	30	18.0
<i>Somewhat disagree</i>	25	15.0
<i>Neither agree nor disagree</i>	30	18.0
<i>Somewhat agree</i>	59	36.0
<i>Strongly agree</i>	21	13.0
<b>People with HIV who have acquired HIV <u>through sex</u> are more at fault for contracting HIV than people with HIV who have acquired HIV through a blood transfusion</b>		
<i>Strongly disagree</i>	38	23.0
<i>Somewhat disagree</i>	39	23.6
<i>Neither agree nor disagree</i>	29	17.6
<i>Somewhat agree</i>	46	28.0
<i>Strongly agree</i>	13	8.0

\*Reverse coded due to the nature of the question for this item

### Level of Willingness of Participants to Provide Care

Almost 23% of respondents were unwilling to bathe the hypothetical patient, and 27% were unwilling to clean his stool/emesis using gloves. However, many students expressed *Willingness* to clean supplies using gloves after the physician completes a diagnostic procedure (**Table 3**).

**Table 3: Willingness to provide clinical care to a patient diagnosed with HIV (n=159)**

<b>Willingness variables</b>	<b>n</b>	<b>%</b>
<b>I would be willing to give a bath to this patient</b>		
<i>Strongly disagree</i>	08	5.0
<i>Somewhat disagree</i>	28	17.6
<i>Neither agree nor disagree</i>	28	17.6

<i>Somewhat agree</i>	46	29.0
<i>Strongly agree</i>	49	30.8
<b>I would be willing to clean his stool/emesis using gloves</b>		
<i>Strongly disagree</i>	12	7.5
<i>Somewhat disagree</i>	31	19.5
<i>Neither agree nor disagree</i>	22	13.8
<i>Somewhat agree</i>	49	30.8
<i>Strongly agree</i>	45	28.3
<b>I would be willing to bring a meal tray to his bed</b>		
<i>Strongly disagree</i>	-	-
<i>Somewhat disagree</i>	-	-
<i>Neither agree nor disagree</i>	01	0.6
<i>Somewhat agree</i>	23	14.5
<i>Strongly agree</i>	135	85.0
<b>I would be willing to change his bedlinen</b>		
<i>Strongly disagree</i>	01	0.6
<i>Somewhat disagree</i>	06	4.0
<i>Neither agree nor disagree</i>	12	7.5
<i>Somewhat agree</i>	45	28.0
<i>Strongly agree</i>	95	60.0
<b>I would be willing to take his vital signs</b>		
<i>Strongly disagree</i>	01	0.6
<i>Somewhat disagree</i>	-	-
<i>Neither agree nor disagree</i>	07	4.4
<i>Somewhat agree</i>	28	17.6
<i>Strongly agree</i>	123	77.4
<b>I would be willing to change his dressings using gloves</b>		
<i>Strongly disagree</i>	02	1.3
<i>Somewhat disagree</i>	09	5.7
<i>Neither agree nor disagree</i>	18	11.3
<i>Somewhat agree</i>	43	27.0
<i>Strongly agree</i>	87	54.7
<b>I would be willing to clean supplies using gloves after the physician completes a diagnostic procedure</b>		
<i>Strongly disagree</i>	01	0.6
<i>Somewhat disagree</i>	06	3.8
<i>Neither agree nor disagree</i>	10	6.3
<i>Somewhat agree</i>	42	26.4
<i>Strongly agree</i>	100	63.0
<b>I would be willing to shave him</b>		
<i>Strongly disagree</i>	07	4.0
<i>Somewhat disagree</i>	22	14.0
<i>Neither agree nor disagree</i>	22	14.0
<i>Somewhat agree</i>	51	32.0

<i>Strongly agree</i>	57	36.0
<b>I would be willing to empty the urinary drainage bag using gloves.</b>		
<i>Strongly disagree</i>	05	3.0
<i>Somewhat disagree</i>	15	9.4
<i>Neither agree nor disagree</i>	24	15.0
<i>Somewhat agree</i>	41	26.0
<i>Strongly agree</i>	74	46.5
<b>I would be willing to start IV fluids using gloves</b>		
<i>Strongly disagree</i>	06	3.8
<i>Somewhat disagree</i>	10	6.3
<i>Neither agree nor disagree</i>	19	12.0
<i>Somewhat agree</i>	39	24.5
<i>Strongly agree</i>	85	53.5
<b>I would be willing to administer blood transfusion using gloves</b>		
<i>Strongly disagree</i>		
<i>Somewhat disagree</i>	08	5.0
<i>Neither agree nor disagree</i>	10	6.3
<i>Somewhat agree</i>	20	12.6
<i>Strongly agree</i>	46	29.0
	75	47.2

## Association between Sociodemographic Characteristics and Categories of *Attitude* and *Willingness*

### *Attitude* domain

Approximately 60.6% of participants had an overall negative or neutral *Attitude*. There was a significant association between the respondents' *Attitude* and age ( $p = 0.002$ ), year in school ( $p = 0.07$ ), and primary geographic upbringing ( $p = 0.04$ ) (**Table 4**).

**Table 4: Differences between participants' socio-demographic characteristics and *Attitudes* toward PLHIV(n=165)**

Variable	Negative <i>Attitude</i> n (%)	Positive <i>Attitude</i> n (%)	p-value
<b>Composite prevalence</b>	100 (60.6)	65(39.4)	NA
<b>Age</b>			
≤35 years	98(98.0)	55(85.0)	<b>0.002<sup>a</sup></b>
>35 years	2(2.0)	10(15.0)	
<b>Study major at ISU</b>			0.52
<i>Dental Hygiene</i>	15(15.5)	09(14.0)	
<i>Nursing</i>	35(35.0)	22(34.0)	
<i>Pharmacy</i>	17(17.0)	13(20.0)	

<i>Radiographic science</i>	19(19.0)	7(11.0)	
<i>Others</i>	14(14.0)	14(22.0)	
<b>Year in school</b>			<b>0.07</b>
<i>Undergraduate 1st-year</i>	25(25.3)	7(11.0)	
<i>Undergraduate 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 4+ year</i>	56(57.0)	45(69.0)	
<i>Graduate 1<sup>st</sup>, 2<sup>nd</sup> year &amp; PharmD (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>)</i>	18(18.0)	13(20.0)	
<b>Type of housing</b>			
<i>Off-campus</i>	83(83.0)	54(83.0)	0.99
<i>On-campus</i>	17(17.0)	11(17.0)	
<b>Primary geographic upbringing</b>			<b>0.04</b>
<i>Rural areas</i>	46(46.0)	25(39.0)	
<i>Semi-urban areas</i>	37(37.0)	18(28.0)	
<i>Suburbs of large cities</i>	8(8.0)	15(23.0)	
<i>Urban area</i>	9(9.0)	7(11.0)	
<b>Gender</b>			
<i>Female</i>	82(84.0)	56(89.0)	0.36
<i>Male</i>	16(16.0)	7(11.0)	
<b>Race</b>			
<i>White</i>	84(84.0)	52(80.0)	0.51
<i>Other than White</i>	16(16.0)	13(20.0)	
<b>Ethnicity</b>			
<i>Hispanic</i>	12(12.0)	10(16.0)	0.43
<i>Non-Hispanic</i>	88(88.0)	51(84.0)	

<sup>a</sup>Fisher exact test (2-sided) p-value

Bold indicates a significant p-value

### **Willingness domain**

The proportion of participants showing a low or neutral overall *Willingness* to care for patients was 33%. There was a significant or trending-to-significant association between *Willingness* and study major ( $p = 0.004$ ), year in school ( $p = 0.010$ ), type of housing ( $p = 0.125$ ), and gender ( $p = 0.136$ ) (Table 5).

**Table 5: Differences between participants' socio-demographic characteristics and *Willingness* to provide care to PLHIV (n=159)**

<i>Variable</i>	<b>Low-level <i>Willingness</i> n (%)</b>	<b>High-level <i>Willingness</i> n (%)</b>	<b>p-value</b>
<b>Composite prevalence</b>	51 (32)	108 (68)	NA
<b>Age</b>			

$\leq 35$ years	48(94.1)	99(91.7)	0.753 <sup>a</sup>
$> 35$ years	3(5.9)	9(8.3)	
<b>Study major at ISU</b>			<b>0.004</b>
Dental Hygiene	7(13.7)	16(14.8)	
Nursing	8(15.7)	44(40.7)	
Pharmacy	16(31.4)	14(13.0)	
Radiographic science	12(23.5)	14(13.0)	
Others	8(15.7)	20(18.5)	
<b>Year in school</b>			<b>0.010</b>
Undergraduate 1st-year	5(10)	26(58)	
Undergraduate 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> , 4+ year	29(24.1)	67(62)	
Graduate 1 <sup>st</sup> , 2 <sup>nd</sup> year & PharmD (1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> , 4 <sup>th</sup> )	16(32)	15(13.9)	
<b>Type of housing</b>			
Off-campus	46(90.2)	87(80.6)	0.125 <sup>a</sup>
On-campus	5(9.8)	21(19.4)	
<b>Primary geographic upbringing</b>			0.430 <sup>a</sup>
Rural areas	24(47.1)	46(42.6)	
Semi-urban areas	17(33.3)	35(32.4)	
Suburbs of large cities	8(15.7)	14(13)	
Urban area	2(3.9)	13(12)	
<b>Gender</b>			
Female	39(78)	93(88.6)	0.136
Male	11(22)	12(11.4)	
<b>Race</b>			
White	11(40.7)	40(30.3)	0.405
Other than White	16(59.3)	92(69.7)	
<b>Ethnicity</b>			
Hispanic	9(17.6)	12(11.5)	0.427
Non-Hispanic	42(82.4)	92(88.5)	

<sup>a</sup>Fisher exact test (2-sided) p-value

Bold indicates a significant or trending to significance p-value

### Relationship Between Socio-demographic Characteristics and Scores for *Attitude* and *Willingness*

Participants aged  $\leq 35$  years had a significantly higher (negative) mean for *Attitude* scores than those aged  $> 35$  years ( $p =$  value 0.01). Males had a significantly higher mean score than females ( $p = 0.04$ ) (**Table 6**). Regarding *Willingness* to provide clinical care to HIV patients, undergraduate respondents had a higher mean level of *Willingness* than graduates ( $p = 0.076$ ).

Nursing majors had a significantly higher mean score than other majors ( $p = 0.005$ ). Students living off-campus scored significantly lower than those living on campus ( $p = 0.023$ ) (**Table 6**).

**Table 6: Differences between participants' socio-demographic characteristics, Attitudes, and Willingness scores to provide care to PLHIV (n=165)**

Variable	Attitude scores Mean (SD)	p-value	Willingness scores Mean (SD)	p-value
<b>Composite scores</b>	40.8 (13.0)		46 (8.42)	<b>NA</b>
<b>Age</b>				
≤35 years	41.5(13.0)	<b>0.01<sup>b</sup></b>	45.8(8.37)	0.280 <sup>b</sup>
>35 years	32.0(7.68)		47.8(9.17)	
<b>Study major at ISU</b>		0.46 <sup>d</sup>		<b>0.005<sup>c</sup></b>
<i>Dental Hygiene</i>	42.8(14.0)		44.3(8.97)	
<i>Nursing</i>	40.3(13.0)		49.5(5.93)	
<i>Pharmacy</i>	38.6(11.5)		43.6(7.70)	
<i>Radiographic science</i>	44.2(12.8)		43.7(9.12)	
<i>Others</i>	39.6(13.7)		45.6(10.2)	
<b>Year in school</b>		0.21 <sup>d</sup>		0.186 <sup>c</sup>
<i>Undergraduate 1st-year</i>	44.3(11.1)		47.2(6.64)	
<i>Undergraduate 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 4+ year</i>	40.2(13.8)		46.4(8.97)	
<i>Graduate 1<sup>st</sup>, 2<sup>nd</sup> year &amp; PharmD (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>)</i>	39.0(11.5)		43.9(7.84)	
<b>Type of housing</b>		0.61 <sup>b</sup>		<b>0.023<sup>b</sup></b>
<i>Off-campus</i>	40.6(12.5)		45.4(8.48)	
<i>On-campus</i>	42.0(15.3)		52.5(7.58)	
<b>Primary geographic upbringing</b>		0.18 <sup>c</sup>		0.996 <sup>c</sup>
<i>Rural areas</i>	42.8(13.1)		45.6(9.04)	
<i>Semi-urban areas</i>	40.7(13.5)		46.2(8.38)	
<i>Suburbs of large cities</i>	36.1(9.6)		46.3(7.37)	
<i>Urban area</i>	39.6(13.62)		46.7(7.60)	
<b>Gender</b>		<b>0.04<sup>b</sup></b>		0.333 <sup>b</sup>
<i>Female</i>	39.8(12.3)		46.4(7.90)	
<i>Male</i>	45.8(13.4)		44.3(9.16)	
<b>Race</b>		0.982 <sup>a</sup>		0.269 <sup>b</sup>
<i>White</i>	40.8(15.0)		46.3(8.46)	
<i>Other than White</i>	40.7(12.5)		44.6(8.23)	



<b>Ethnicity</b>				
<i>Hispanic</i>	41.5(17)	0.61 <sup>b</sup>	44.4(10.7)	0.661 <sup>b</sup>
<i>Non-Hispanic</i>	41.2(12)		46.1(8.11)	

<sup>a</sup>Independent sample t-test

<sup>b</sup>Mann Whitney U test 2-sided p-value

<sup>c</sup>Kruskal Walli's test 2-sided p-value

<sup>d</sup>one-way ANOVA 2-sided p-value

### Factors associated with *Attitude* and *Willingness*

The multivariable logistic regression model revealing an association of negative *Attitude* showed that age, year in school, and setting of primary upbringings were significantly associated with *Attitude* categories among the study subjects. It was shown that compared to age  $\leq 35$  years, those  $>35$  years had significantly lower odds of a negative *Attitude* (OR=0.13, p-value 0.014). Compared to those in the first year of undergraduate education, students in higher undergraduate years had significantly lower odds of negative *Attitudes* (OR=0.32, p-value 0.024). Similarly, compared to those with a primary upbringing in rural areas, suburbs of large cities upbringings

Variable	Odds ratio	95% Confidence Interval		p-value
		Lower	Upper	
<b>Age group</b>				
$\leq 35$ years	Ref			<b>0.014</b>
$>35$ years	0.13	0.03	0.70	
<b>Year in school</b>				<b>0.079</b>
<i>Undergraduate 1st-year</i>	Ref			
<i>Undergraduate 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 4+ year</i>	0.32	0.12	0.86	<b>0.024</b>
<i>Graduate 1<sup>st</sup>, 2<sup>nd</sup> year &amp; PharmD (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>)</i>	0.39	0.12	1.30	0.113
<b>Primary geographic upbringing</b>				<b>0.078</b>
<i>Rural areas</i>	Ref			
<i>Semi-urban areas</i>	0.71	0.21	2.40	0.58
<i>Suburbs of large cities</i>	0.26	0.10	0.74	<b>0.012</b>
<i>Urban area</i>	0.93	0.42	2.04	0.854

were associated with significantly lower odds of a negative *Attitude* (OR=0.25, p-value 0.012).

Model fit measures showed a p-value of 0.001 (**Table 7**).

**Table 7: Multivariable logistic regression model showing association of negative *Attitude* versus positive *Attitude***

*Bold indicates a significant p-value*

The multivariable logistic regression model showing associations of high *Willingness* levels revealed that the year in school was significantly associated with *Willingness* scores among the study subjects. It was shown that compared to those in the first year of undergraduate education, students in higher undergraduate or graduate years had significantly lower odds of high *Willingness* (OR=0.43, p-value 0.12) and (OR=0.21, p-value 0.01), respectively. Model fit measures showed a p-value of 0.023. The ‘study majors’ were dropped from the final model due to high multicollinearity and multiple responses, respectively (**Table 8**).

**Table 8: Multivariable logistic regression model showing association of high versus low *Willingness***

Variable	Odds ratio	95% Confidence Interval		p-value
		Lower	Upper	
<b>Year in school</b>				<b>0.04</b>
<i>Undergraduate 1st-year</i>	Ref			
<i>Undergraduate 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>, 4+ year</i>	0.43	0.15	1.30	0.12
<i>Graduate 1<sup>st</sup>, 2<sup>nd</sup> year &amp; PharmD (1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup>)</i>	0.21	0.10	0.71	<b>0.01</b>
<b>Gender</b>				
<i>Female</i>	Ref			
<i>Male</i>	0.66	0.25	1.80	0.40
<b>Type of housing</b>				
<i>Off-campus</i>	Ref			
<i>On-campus</i>	1.92	0.65	5.64	0.24

*Bold indicates a significant or trending to significance p-value*

## Chapter V: Discussion

This study aimed to assess the *Attitudes* of health sciences and allied professions students toward PLHIV and their *Willingness* to provide care for them and determine factors associated with such *Attitudes* and *Willingness*. Study results showed that most research participants were females, younger than 35, of non-Hispanic origin, and were raised in rural or semi-urban areas. Of all possible sources, academic courses at ISU were the primary source of learning about HIV and AIDS. Fear around personal transmission risks for HIV and the stigma attached to the condition mainly formed students' *Attitudes* towards PLHIV. It was also revealed that regarding *Attitudes* toward PLHIV, most participants reflected negative *Attitudes* but a relatively high *Willingness* to provide care, as more than half of students scored higher in the *Willingness* domain. Study results revealed a significant association between the respondents' *Attitude* and age, year in school and primary geographic upbringing.

A study on Chinese service providers (nurses, doctors, and laboratory technicians) working in a public healthcare facility showed that older service providers reported less discriminatory attitudes than their younger counterparts. This can result from older health-care providers' experience (Li et al., 2007). Those with any experience working in clinical settings were excluded from the current study to assess the impact produced by the curriculum. However, this can still be true for older students in this study.

The association of primary geographic upbringing with *Attitudes* toward PLHIV reflects the influence of cultural and social values derived from upbringing in certain population groups. It implies that geographical upbringing and place of residence, whether rural or urban, is significant in determining the level of discrimination towards PLHIV and thus designing the targeted interventions. It is reasonable to expect that individuals residing in rural settings may have less access to information about HIV, leading to more significant discrimination towards those living with the condition. This finding is consistent with previous studies conducted in low- and middle-income countries. A recent study that was conducted amongst Pakistani women of

reproductive age using the 2017–18 Pakistani Demographic Health Survey (PDHS) revealed that individuals living in a rural setting and hailing from a low socioeconomic background were more likely to present with a negative attitude towards PLHIV (Sameen et al., 2023). However, it contradicts the results of a study conducted in Malaysia, where urban and suburban residents exhibited more significant stigma toward HIV-infected individuals compared to their rural counterparts (Wong, 2013). Further research is needed to explore the reasons for this discrepancy.

The results showed that *Attitudes* towards PLHIV improved with increasing age or education, but *Willingness* to provide clinical care to them reduced. Also, there was a lack of uniformity in the *Willingness* to care for patients among different study majors.

Interestingly, nursing students were the most willing to care for the patient among all study majors. This is consistent with the other studies that suggest that nurses bear a responsibility to safeguard and promote the well-being of their patients, thereby upholding societal values [(Gastmans, 2013), (Munkeby et al., 2021), (The ICN Code of Ethics for Nurses)]. However, HIV/AIDS has presented to nursing students, among other members of society, with a moral quandary regarding caring for individuals afflicted with a lethal infectious disease, as evidenced by negative *Attitude* scores by most of the respondents in this study. Nursing students' positive, neutral, and negative attitudes toward PLHIV were reported worldwide in the literature. For instance, positive attitudes toward PLHIV were reported in Australia (Pickles et al., 2012) and South Africa (Delobelle et al., 2009). It can also be explained that the curriculum is less specific to Infectious Diseases, and due to their less hands-on experience with PLHIV than nursing students, other study majors were less willing to provide clinical care to them.

Since health sciences students will become ultimate health care providers, their positive attitudes toward caring for PLHIV are essential to providing high-quality, nonjudgmental care. WHO has already recommended educating pre-entry service providers on AIDS HIV (WHO, The Global Health Sector Strategy on HIV/AIDS 2011–2015). It is indeed a crucial aspect of disease control that requires attention. It is also important that education authorities prepare appropriate educational protocols for teaching students regarding the treatment and care of people with HIV. According to Williams et al. (2006), care providers must have the knowledge and confidence to protect themselves from effectively performing this work. They must be well-informed about the clinical course of HIV and effective strategies for its prevention and treatment. Besides, they must be prepared to care for patients from various cultural and social backgrounds whose experiences

and values may differ from their own and recognize that patients with HIV should be given the same care as HIV-negative patients.

Previous studies have also shown that health science college students and pharmacists with high knowledge levels were likely to report low levels of stigma and better attitude scores towards PLHIV (Balfour et al., 2010). Literature has also highlighted the importance of emotional sensitivity training for healthcare workers dealing with PLHIV. Sensitivity training should be a crucial aspect of any comprehensive HIV educational program. Healthcare workers must be aware of the emotional impact of HIV stigma on patients and be equipped to handle such situations with empathy and compassion. Unfortunately, most training programs overlook the emotional aspects of working with PLHIV, making raising awareness and providing sensitivity training to healthcare workers even more essential. Such training can help healthcare workers reflect on their attitudes and comfort levels while discussing sensitive topics related to HIV and its transmission (Massiah et al., 2004).

In previous studies on improving students' attitudes toward PLHIV, it was emphasized that students who interact with patients as part of their training are less likely to exhibit stigmatizing beliefs. A study pointed to the benefits of such a program, where even inviting HIV patients to be instructors for medical students—a patient instructor model—has been found to reduce the stigmatizing attitudes of those students (Jaworsky et al., 2016).

### **Strengths and Limitations**

To the researcher's knowledge, this is the first study conducted on a representative sample of health sciences students in the Mountain West region. As a web-based survey, students could respond flexibly without stress to produce desirable responses. The survey tool was validated and capable of conveying the true meanings of the questions to the respondents. The survey methodology involved efficient, cost-effective, and self-administrated response methods. Being electronically entered, data was instantly available and quickly transferred into specialized statistical software for detailed analysis.

However, this study also had several limitations, and the results should be interpreted in light of these limitations. First, as a web-based survey, students could only be persuaded to respond to some of the sections of this survey. Secondly, the required sample size could be reached to achieve a 90% confidence level. Furthermore, this study relied on self-reported data. Students were reassured of confidentiality, but chances of incorrect responses must be included. Though beyond

its scope, this study could have been enhanced by a qualitative component to explore the reasons behind the participants' responses.

## Conclusions

HIV-related stigma and discrimination, especially among health professionals, remain key challenges to successfully implementing HIV services and programs. This study shows substantial shortfalls in *Attitude* and *Willingness* to care for PLHIV among health sciences students. These findings can help to inform curriculum development in the health sciences disciplines of ISU, thereby enhancing the training of professionals who are better equipped to provide care for patients with HIV/AIDS. Educational programs implemented for students need to be evaluated for their impact on the attitudes, knowledge, and work practices of those participating. Further research is required to understand the causes of stigma better, how stigma affects HIV prevention and care, and how best to reduce stigma and, thus, alleviate its impact on care in this group of health sciences students in the Mountain West Region.

## Recommendations

- Academic undergraduate courses, still being a significant means of acquiring education about HIV, provide a window of opportunity to improve the knowledge, attitude, and willingness of students to provide clinical care to PLHIV.
- Uniform training is recommended for all the health sciences disciplines to improve the chances of uniform positivity in attitude and improved willingness to serve PLHIV, possibly through interprofessional teaching pedagogies
- Behavior change interventions for the students are recommended as they progress to senior years to improve empathy and willingness to provide care to PLHIV.
- There should be a comprehensive course on HIV infection for all health sciences students, which should cover the basic science, clinical, social, and mental health aspects of HIV and develop an understanding of how to interact with PLHIV to reduce stigma and improve clinical outcomes possibly through interprofessional teaching pedagogies.
- Overall, a relook into the current undergraduate curriculum is recommended to bring uniformity in *Attitude* and *Willingness* to provide patient care to the maximum possible efficiency

- Appropriate education and training of health sciences students about the disease can help reduce their negative attitudes, emotions, and discriminatory behaviors against HIV-affected patients and protect them from self and cross-contamination.
- Future studies should be built on better strategies to capture the maximum sample size for more significant findings.
  - Addressing the social stigma attached to HIV and STI needs further operational research and planning of curricular interventions.

## References

- Abdul Kadir, N., & Schütze, H. (2022). A systematic review of medical educators' perspectives on the barriers and enablers of teaching public health in undergraduate medical schools. *Global health action*, 15(1), 2106052.  
<https://doi.org/10.1080/16549716.2022.2106052>
- Alqahtani, F. Y., Alattas, S. H., Almangour, T. A., & Aleanizy, F. S. (2021). Status of infectious disease content in the professional pharmacy curriculum in Saudi Arabia: Results of a national survey. *Saudi Pharmaceutical Journal: SPJ: The Official Publication of The Saudi Pharmaceutical Society*, 29(12), 1492–1497.  
<https://doi.org/10.1016/j.jsps.2021.11.009>
- Balfour L, Corace K, Tasca GA, et al. High HIV knowledge relates to low stigma among pharmacists and university health science students in Guyana, South America. *Int J Infect Dis*. 2010;14:e881–e887
- Bandura, A. (1995). *Social Foundations of thought and action: A social cognitive theory*. Prentice Hall.
- Bosh, K. A., Hall, H. I., Eastham, L., Daskalakis, D. C., & Mermin, J. H. (2021). The estimated annual number of HIV infections — United States, 1981-2019. *MMWR. Morbidity and Mortality Weekly Report* 70(22), 801–806. <https://doi.org/10.15585/mmwr.mm7022a1>
- Centers for Disease Control and Prevention. (2017, October 16). *State Health Profiles*. Centers for Disease Control and Prevention. Retrieved November 16, 2022, from <https://www.cdc.gov/nchhstp/stateprofiles/default.htm>
- Centers for Disease Control and Prevention. (2023, January 19). *HIV criminalization and ending the HIV epidemic*. Centers for Disease Control and Prevention.  
<https://www.cdc.gov/hiv/policies/law/criminalization-ehe.html>
- Cloeckaert, A., & Kuchler, K. (2020). Grand challenges in infectious diseases: Are we prepared for worst-case scenarios? *Frontiers in Microbiology*, 11, 613383.  
<https://doi.org/10.3389/fmicb.2020.613383>
- Delobelle, P., Rawlinson, J. L., Ntuli, S., Malatsi, I., Decock, R., & Depoorter, A. M. (2009). HIV/AIDS knowledge, attitudes, practices and perceptions of rural nurses in South Africa. *Journal of Advanced Nursing*, 65(5), 1061–1073. <https://doi.org/10.1111/j.1365-2648.2009.04973.x>



- Dubbert, P. M., Kemppainen, J. K., & White-Taylor, D. (1994). Development of a measure of willingness to provide nursing care to AIDS patients. *Nursing Administration Quarterly*, 18(2), 16–21. <https://doi.org/10.1097/00006216-199401000-00009>
- Frain J. A. (2017). Preparing every nurse to become an HIV nurse. *Nurse Education Today*, pp. 48, 129–133. <https://doi.org/10.1016/j.nedt.2016.10.005>
- Gastmans, C. (2013). Dignity-enhancing nursing care. *Nursing Ethics*, 20(2), 142–149. <https://doi.org/10.1177/0969733012473772>
- Gauthier, T. P., Worley, M., Laboy, V., Hernandez, L., Unger, N. R., Sherman, E. M., Frederick, C., & Aragon, L. (2015). Clinical infectious diseases pharmacists in the United States: A problem of both supply and demand. *Clinical infectious diseases: An official publication of the Infectious Diseases Society of America*, 60(5), 826–827. <https://doi.org/10.1093/cid/ciu908>
- Goetz, A., Yu, C. M., & Muder, R. R. (1992). Microbiology, infection control, immunizations, and infectious disease exposure: Education and practices in United States nursing schools. *American Journal of Infection Control*, 20(3), 115–121. [https://doi.org/10.1016/s0196-6553\(05\)80175-0](https://doi.org/10.1016/s0196-6553(05)80175-0)
- Heimbinder, M. (1967). McLendon, Jonathon C., editor. Social Foundations of Education: Current readings from the Behavioral Sciences. New York: Macmillan, 1966. 382 pp. \$3.95. *Journal of Teacher Education*, 18(4), 506–507. <https://doi.org/10.1177/002248716701800422>
- Jacque, B., Koch-Weser, S., Faux, R., & Meiri, K. (2016). Addressing health literacy challenges with a cutting-edge infectious disease curriculum for the high school biology classroom. *Health education & behavior: The official publication of the Society for Public Health Education*, 43(1), 43–53. <https://doi.org/10.1177/1090198115596163>
- Jahanfar, S., Lye, M. S., & Rampal, L. (2009). A randomized controlled trial of peer-adult-led intervention on improvement of knowledge, attitudes, and behavior of university students regarding HIV/AIDS in Malaysia. *Singapore Medical Journal*, 50(2), 173–180
- Jaworsky, D., Gardner, S., Thorne, J. G., Sharma, M., McNaughton, N., Paddock, S., Chew, D., Lees, R., Makuwaza, T., Wagner, A., & Rachlis, A. (2016). The role of people living with HIV as patient instructors – reducing stigma and improving interest in HIV care

- among medical students. *AIDS Care*, 29(4), 524–531.  
<https://doi.org/10.1080/09540121.2016.1224314>
- Jeffres, M. N., Biehle, L. R., & MacDougall, C. (2018). Comprehensive assessment of didactic curriculum and career interest in infectious diseases among graduating United States pharmacy students. *Open Forum Infectious Diseases* 5(11), ofy284.  
<https://doi.org/10.1093/ofid/ofy284>
- Jeffres, M. N., Kufel, W. D., Biehle, L. R., Cho, J. C., Narayanan, N., Gruenberg, K., Garcia, J., & MacDougall, C. (2019). A comprehensive survey of infectious diseases curriculum among US pharmacy schools. *American Journal of Pharmaceutical Education* 83(9), 7168. <https://doi.org/10.5688/ajpe7168>
- Khabbaz, R. F., Moseley, R. R., Steiner, R. J., Levitt, A. M., & Bell, B. P. (2014). Challenges of infectious diseases in the USA. *Lancet (London, England)*, 384(9937), 53–63.  
[https://doi.org/10.1016/S0140-6736\(14\)60890-4](https://doi.org/10.1016/S0140-6736(14)60890-4)
- Li, L., Wu, Z., Wu, S., Zhaoc, Y., Jia, M., & Yan, Z. (2007). HIV-related stigma in health care settings: A survey of service providers in China. *AIDS Patient Care and STDs*, 21(10), 753–762. <https://doi.org/10.1089/apc.2006.0219>
- Malhotra, S., Khurshid, A., Hendricks, K. A., & Mann, J. R. (2008). Medical School Sexual Health Curriculum and Training in the United States. *Journal of the National Medical Association*, 100(9), 1097–1106. [https://doi.org/10.1016/s0027-9684\(15\)31452-8](https://doi.org/10.1016/s0027-9684(15)31452-8)
- McLendon, J. C. (1966). *Social Foundations of Education: Current readings from the Behavioral Sciences*. Macmillan
- Messiah, E., Roach, T. C., Jacobs, C., St. John, A. M., Inniss, V., Walcott, J., & Blackwood, C. (2004). Stigma, discrimination, and HIV/AIDS knowledge among physicians in Barbados. *Revista Panamericana de Salud Pública*, 16(6), 295–401.  
<https://doi.org/10.1590/s1020-49892004001200005>
- Mosadeghrad A. M. (2014). Factors influencing healthcare service quality. *International journal of health policy and management*, 3(2), 77–89. <https://doi.org/10.15171/ijhpm.2014.65>
- Munkeby, H., Moe, A., Bratberg, G., & Devik, S. A. (2021a). ‘ethics between the lines’ – nurses’ experiences of ethical challenges in long-term care. *Global Qualitative Nursing Research*, 8, 233339362110600. <https://doi.org/10.1177/23333936211060036>

- Patrick, W. K., & Cadman, E. C. (2002). Changing emphases in public health and medical education in health care reform. *Asia Pacific Journal of Public Health*, 14(1), 35–39. <https://doi.org/10.1177/101053950201400108>
- Pickles, D., King, L., & Belan, I. (2009). Attitudes of nursing students towards caring for people with HIV/AIDS: Thematic literature review. *Journal of Advanced Nursing*, 65(11), 2262–2273. <https://doi.org/10.1111/j.1365-2648.2009.05128.x>
- Pickles, D., King, L., & Belan, I. (2012). Undergraduate Nursing Student's attitudes towards caring for people with HIV/AIDS. *Nurse Education Today*, 32(1), 15–20. <https://doi.org/10.1016/j.nedt.2011.01.008>
- Rao, R., Hawkins, M., Ulrich, T., Gatlin, G., Mabry, G., & Mishra, C. (2020). The evolving role of public health in medical education. *Frontiers In Public Health*, 8, 251. <https://doi.org/10.3389/fpubh.2020.00251>
- Salsberg, E., Mahmoud, N., Quigley, L., Erikson, C., Roberts, A., & The Infectious Diseases Society of America. (2017). (rep.). The future supply and demand for infectious disease physicians. George Washington University
- Sameen, S., Lakhdir, M. P., Azam, S. I., & Asad, N. (2023). Evaluating knowledge about HIV and discriminatory attitudes among Pakistani women of reproductive age using 2017–18 demographic health survey data. *Scientific Reports*, 13(1). <https://doi.org/10.1038/s41598-023-45117-z>
- SCT: *Social cognitive theory by Albert Bandura*. Behavior Institute - The world's largest collection of resources and data on behavioral science. (n.d.). Retrieved December 1, 2022, from <https://www.besci.org/models/social-cognitive-theory>
- Spach, D. H., Wood, B. R., Karpenko, A., Unruh, K. T., Kinney, R. G., Roscoe, C., & Nelson, J. (2016). Creating a national HIV curriculum. *The Journal of the Association of Nurses in AIDS Care: JANAC*, 27(3), 261–273. <https://doi.org/10.1016/j.jana.2016.02.002>
- Tashiswaka, D. I., & Inungu, J. N. (2017). Advances in HIV Prevention and Treatment: A Literature Review. *Current Research on HIV/AIDS*, 2017(03). Retrieved November 10, 2022, from <https://www.gavinpublishers.com/article/view/advances-in-hiv-prevention-and-treatment-a-literature-review>
- The ICN Code of Ethics for Nurses - International Council of Nurses. (n.d.). [https://www.icn.ch/sites/default/files/inline-files/ICN\\_Code-of-Ethics\\_EN\\_Web.pdf](https://www.icn.ch/sites/default/files/inline-files/ICN_Code-of-Ethics_EN_Web.pdf)

- Wagner, A. C., Hart, T. A., McShane, K. E., Margolese, S., & Girard, T. A. (2014). Health care provider attitudes and beliefs about people living with HIV: Initial validation of the health care provider HIV/AIDS stigma scale (HPASS). *AIDS and Behavior*, 18(12), 2397–2408. <https://doi.org/10.1007/s10461-014-0834-8>
- Wang, M., Han, X., Fang, H., Xu, C., Lin, X., Xia, S., Yu, W., He, J., Jiang, S., & Tao, H. (2018). Impact of health education on knowledge and behaviors toward infectious diseases among students in Gansu province, China. *BioMed Research International*, 2018, 6397340. <https://doi.org/10.1155/2018/6397340>
- Weinstein, N. D., & Sandman, P. M. (1992). A model of the precaution adoption process: Evidence from home radon testing. *Health Psychology*, 11(3), 170–180. <https://doi.org/10.1037/0278-6133.11.3.170>
- Williams A.B., Wang H., Burgess J., Wu C., Gong Y., Li Y. Effectiveness of an HIV/AIDS educational program for Chinese nurses. *Journal of Advanced Nursing*. 2006;53(6):710–720.
- Wong, L. P. (2013). Prevalence and factors associated with HIV/AIDS-related stigma and discriminatory attitudes: A cross-sectional nationwide study. *Preventive Medicine*, 57. <https://doi.org/10.1016/j.ypmed.2013.03.013>
- World Health Organization. The Global Health Sector Strategy on HIV/AIDS 2011-2015. An Interim Review of Progress, 2014. Available from: [https://apps.who.int/iris/bitstream/handle/10665/112790/9789241507295\\_eng.pdf?sequence=1](https://apps.who.int/iris/bitstream/handle/10665/112790/9789241507295_eng.pdf?sequence=1)
- Younas, A., Zeb, H., Aziz, S. B., Sana, S., Albert, J. S., Khan, I. U., Inayat, S., Khan, F. H., & Rasheed, S. P. (2019). Perceived challenges of nurse educators while teaching undergraduate nursing students in Pakistan: An exploratory mixed-methods study. *Nurse Education Today*, pp. 81, 39–48. <https://doi.org/10.1016/j.nedt.2019.07.002>

## Appendix A: Data Collection Tool

Part 1: Socio-demographic Data	
How old are you (in years)	
Are you a graduate or undergraduate student at ISU? [select one]	a) Graduate student b) Undergraduate student
What is your major at ISU? [select all that apply]	a) Dental Hygiene b) Dietetics c) Medical Assisting d) Medical Lab Science e) Nursing f) Paramedic Science g) Pharmacy h) Physical Therapy i) Radiographic Science j) Respiratory Therapy k) Other (please specify)
What is your year in school?	a) 1 <sup>st</sup> -year undergraduate b) 2 <sup>nd</sup> -year undergraduate c) 3 <sup>rd</sup> -year undergraduate d) 4 <sup>th</sup> -year undergraduate e) 4+ year undergraduate f) 1 <sup>st</sup> year graduate g) 2 <sup>nd</sup> year graduate h) 2+ year graduate i) PharmD year 1 j) PharmD year 2 k) PharmD year 3 l) PharmD year 4 m) Other (please specify)
Do you live in on-campus or off-campus housing?	a) Off-campus b) On-campus
In which type of setting were you primarily raised?	a) Rural areas b) Semi-Urban areas c) Suburbs of large cities d) Urban areas
Gender	a) Female b) Male

	c) Non-binary d) Transgender female e) Transgender male f) Do not want to reveal g) Gender is not listed. My gender is-----
Race	a) American Indian or Alaskan Native b) Asian or Pacific Islander c) Black or African American d) White e) Do not want to reveal f) Other
Ethnicity	a) Hispanic b) Non-Hispanic c) Other d) Do not want to reveal

Part 2: Attitude towards People Living with HIV and Willingness to Provide Care among Health Sciences Students at a Public University in the Mountain West Region					
Part 1. Attitudes toward people living with HIV/AIDS (PLHIV)					
Below is a list of ideas about people with HIV (human immunodeficiency virus). Some ideas may be true for you, and others may not. People hold a wide range of ideas about people with HIV, and we are interested in your particular ideas. Some questions ask about you as a clinician. Answer these questions as if you were providing care to patients. Please answer the questions honestly – your responses are completely anonymous.					
Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly Agree	
I think people with HIV have engaged in risky activities despite knowing the risks	1	2	3	4	5
I believe I have the right to refuse to provide care/treatment to people with HIV for the safety of other patients	1	2	3	4	5
People with HIV present a threat to my health	1	2	3	4	5
People with HIV present a threat to the health of other patients	1	2	3	4	5
I would avoid conducting specific healthcare procedures on people with HIV	1	2	3	4	5
People with HIV tend to have numerous sexual partners	1	2	3	4	5
I would instead not come into physical contact with people with HIV	1	2	3	4	5
I would want to wear two sets of gloves when examining people with HIV	1	2	3	4	5
I would be comfortable working alongside another healthcare provider who has HIV*	1	2	3	4	5
I think many people with HIV likely have substance abuse problems	1	2	3	4	5
I would rather see a patient who does not have HIV than a patient who has HIV but has non-HIV-related concerns	1	2	3	4	5
I often think people with HIV have caused their health problems	1	2	3	4	5
I would be hesitant to send people with HIV to get blood work done due to my fear of others'	1	2	3	4	5

safety					
I worry that universal precautions are not reasonable enough to protect me from people with HIV	1	2	3	4	5
I would feel uncomfortable knowing one of my colleagues is HIV-positive	1	2	3	4	5
People with HIV who have acquired HIV <b>through injection drug use</b> are more at fault for contracting HIV than people with HIV who have acquired HIV through a blood transfusion	1	2	3	4	5
People with HIV who have acquired HIV <b>through sex</b> are more at fault for contracting HIV than people with HIV who have acquired HIV through a blood transfusion	1	2	3	4	5
If one of your relatives who is HIV positive becomes ill, would you be willing to care for her/him in your house or community? *	1	2	3	4	5
Where have you learned the most about HIV (human immunodeficiency virus) and AIDS (acquired immunodeficiency syndrome)? (Select all that apply.)	academic courses at ISU, academic courses in middle or high school, family, friends, infectious diseases websites (e.g., Centers for Disease Control), News, social media, the Internet, and other (specify)				

### Part 3: Willingness to provide clinical/nursing care to a patient diagnosed with HIV

Answer the following questions **assuming a hypothetical scenario in which you are on a clinical posting in a hospital and an HIV-positive male patient is assigned to you during your shift. Reviewing the patient's medical record, he had lived with a male companion for the last few years and was admitted due to HIV-related complications. He had elevated temperature, labored breathing, and heavy perspiration on examination. He had an IV drip and an external condom catheter in place. He had vomited and was stool incontinent. He also had an altered mental status.**

**Please answer the questions honestly – your responses are completely anonymous.**

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly Agree
I would be willing to give a bath to this patient.	1	2	3	4	5
I would be willing to clean his stool/emesis using gloves.	1	2	3	4	5
I would be willing to bring a meal tray to his bed.	1	2	3	4	5
I would be willing to change his bed linen.	1	2	3	4	5
I would be willing to take his vital signs.	1	2	3	4	5
I would be willing to change his dressings using gloves.	1	2	3	4	5
I would be willing to clean supplies using gloves after the physician completes a diagnostic procedure.	1	2	3	4	5
I would be willing to shave him.	1	2	3	4	5
I would be willing to empty the urinary drainage bag using gloves.	1	2	3	4	5
I would be willing to start IV fluids using gloves.	1	2	3	4	5
I would be willing to administer blood transfusion using gloves.	1	2	3	4	5

\*Reverse coded

### **Appendix Ba: IRB approval letter**



IRB.pdf

### **Appendix Bb: Student consent statement at Qualtrics**

I am a student at ISU, above 18 years of age, and I consent to participate in the study on "Attitude towards People Living with HIV (Human Immunodeficiency Virus) and Willingness to Provide Care among Health Sciences Students at a Public University in the Mountain West Region." I can participate in this study as I have no experience working in a clinical setting. I understand that my contact details will be confidential, and my responses will be completely anonymous.