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Title

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Permalink

https://escholarship.org/uc/item/8bc0039n

Journal

AIDS patient care and STDs, 13(7)

ISSN

1087-2914

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Publication Date

1999-07-01

Peer reviewed

Willingness to Treat HIV-Positive Patients at Different Stages of Medical Education and Experience

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ABSTRACT

The willingness of physicians to provide care to HIV-positive patients has been linked to a number of attitudinal factors, but little is known concerning the impact of premedical, medical, and residency training on these factors. The purpose of this study is to elicit responses to the same series of questions concerning HIV and its treatment from respondents at different stages of training, to detect trends in attitudes and to measure the impact of those attitudes on willingness to provide care for HIV/AIDS patients. Study data come from a cross-sectional survey ($n = 249$) of respondents across the training continuum, from premedical students to faculty physicians, using a self-administered questionnaire at a single medical school. The response rate was 59.6%. The study showed significant decreases in personal fear and misgivings concerning HIV, coupled with a substantial decrease in the perceived need for testing of non–high-risk individuals, as respondents gained additional education and training. Overall, the intent to treat HIV did not change significantly by training level, but multivariate analyses showed that while the initially strong influence of attitudes toward AIDS and its attendant risks diminishes, comfort relative to being around homosexuals per se continues to exert an impact on the intent to treat. Appropriate use of protective measures when providing care becomes far more common once individuals enter their clinical training years. The impact of medical education through its entire continuum therefore shows a positive impact on attitudes toward HIV, despite the absence of a significant trend in respondents' stated intent to treat. However, negative attitudes toward homosexuals continue to exert a negative influence on intent to treat that endures into the clinical training years.

INTRODUCTION

ALTHOUGH IT HAS BEEN MORE than 15 years since evidence of the HIV pandemic was first reported,[1] the willingness and ability of primary care physicians to treat patients with HIV disease remain serious health policy concerns. The reluctance of primary care physicians to treat HIV patients became a major issue early in the history of the pandemic, and was well documented in regional and national surveys conducted almost a decade ago.[2,3]

These surveys show that fully half of primary care physicians would not treat people with HIV infection if given a choice.[3] More recently, studies have demonstrated deficiencies in the ability of primary care physicians to recognize important physical findings associated with HIV infection and to provide appropriate initial care to infected patients;[4-6] one study concluded that patients of physicians with little experience treating AIDS have significantly lower survival rates.[7]

Clinical issues related to primary care for HIV disease are at least partially attributable to the fact that, until recently, physicians completed their training with little systematic preparation in the care of HIV-infected patients. This is being rectified by means of intensive training programs offered by federally-funded AIDS education and training Centers,[8] as well as by traditional continuing medical education,[9] both of which can be expected to ameliorate the fears and concerns of health professionals as well as to augment clinical skills.

The reluctance of professionals to treat HIV patients has been apparent since the early days of the pandemic, when experts characterized the risk to providers as "low," but found the actual magnitude of the risk difficult to quantify.[10] Subsequent analyses have shown that the risk of death for medical students and residents from occupationally acquired HIV infection is comparable to that for motor vehicle accidents, which is the leading cause of death in their age group.[11] However, it is attitudes of primary care physicians toward HIV patients that are most frequently cited as barriers to providing care to those patients.[12] Among students, it became apparent through earlier studies that attitudes associated with an unwillingness to treat these patients included their views of homosexuals and other high-risk groups and their perceptions of physicians' professional responsibilities, as well as the perceived risk associated with provision of HIV care.[13,14]

Utilizing a variety of attitudinal measures, previous studies looking at individuals at various stages of the educational continuum have shown that college students become more tolerant toward AIDS with increasing age,[15] that medical students transitioning from their pre-clinical to their clinical years are either *more* willing[16] or *less* willing[17] to care for HIV patients, and that medical students and faculty are similar in their related attitudes and in their willingness to treat AIDS patients,[18,19] whereas residents are less willing to do so.[19,20] The latter finding might relate to the widespread concern among senior residents regarding the adequacy of their training in AIDS ambulatory care.[21]

Evidence of the impact of these factors upon choice of institution in which to receive medical training is somewhat sparse, but findings suggest (based both on medical student surveys and analysis of students' choices of residency positions in the National Resident Matching Program) that potential exposure to large numbers of patients with HIV may be a significant factor in residency training preferences.[22-24] However, a recent study has suggested that the population HIV rate does not necessarily predict numbers of HIV patients seen by medical students during their training,[25] and, in any case, a survey of medical school applicants showed that perceived exposure to HIV patients does not influence medical school selection.[26]

In the present study, a broader examination of effects of training and experience on HIV-related attitudes, knowledge and clinical practice was undertaken by eliciting answers to the same attitudinal and behavioral questions from groups of respondents ranging from lower-division college students (premedical majors) to academic physicians on a school of medicine faculty. While this makes some issues (e.g., regarding clinical practice) highly speculative for certain of the respondents, it provides a continuity of substantive coverage that should first clarify the somewhat contradictory results summarized above regarding trends in attitudes over different stages in the long process of educating physicians. Second, recognizing that the relationships between attitudes, knowledge, and behavior are complex, and that each component can influence the others both directly and indirectly,[27] we have constructed multivariate regression equations suitable for assessing the individual and simultaneous impact of multiple factors on respondents' intent

to treat HIV patients. Third, we look at the issue of appropriate versus inappropriate use of precautions for various categories of patients.

The three study questions, therefore, are as follows: (1) How is the impact of level of training and experience on attitudes, knowledge, and behavior related to provision of medical treatment for persons with HIV disease? (2) Which of these factors, if any, are related to respondents' intentions with regard to treating HIV-positive patients? (3) Do self-reports of intended or actual use of personal precautions while treating various categories of patients show improvement in ability to identify appropriate measures as medical students progress from their pre-clinical to their clinical years of education?

MATERIALS AND METHODS

This study utilized a self-administered questionnaire distributed to academic physicians, medical residents, first and third year medical students, and lower- and upper-division college students who were either premedical majors or had expressed an interest in pursuing a medical career, all at the University of California, Irvine. The resulting respondent group of 249 participants is broken down by category in Table 1, which also shows the composition of respondents for each of the study's three analyses: trends by level of training and experience, explanatory factors for intent to treat HIV and AIDS patients, and appropriate use of precau-

tions in clinical practice settings. Respondents to the survey consisted of college students enrolled in a course on biomedical ethics, medical students taking classes on infection control and universal precautions as part of the regular medical microbiology curriculum (first year) or during introduction to clerkship classes (third year), and residents and faculty attending medical and surgical grand rounds. Among those enrolled in the biomedical ethics course (who were either formal pre-medical majors or had a strong interest in a career in medicine), 175 questionnaires were distributed and 117 were returned, for a response rate of 66.9%. First-year medical students were given the questionnaire during the class on infection control and universal precautions, and asked to return it at the next class meeting. Third-year medical students were given the questionnaire following a class on applying for residencies, and they also received a follow-up letter asking them to complete and return the questionnaire. Collectively, 143 questionnaires were distributed to medical students and 96 returned, for a medical student response rate of 67.1%.

For residents and faculty attending medical or surgical grand rounds, questionnaires were passed out at lecture doorways as attendees were departing. The response rate was lower, as participants had to both fill out the self-administered questionnaire without benefit of a follow-up reminder and then return it to the hospital's Medical Staff Office. One hundred questionnaires were distributed to this com-

TABLE 1. STUDY RESPONDENTS FOR HIV/AIDS SURVEY

Respondent category	Case base for comparison of level of training	Case base for intent to treat HIV/AIDS	Case base for appropriateness of precautions
Lower division college students[a]	41	117	—
Upper division college students[a]	76		
First-year medical students	71	71	71
Third-year medical students	25	45	45
Resident physicians	20		
Faculty physicians	16	—	—
Total	249	233	116

[a]Either formal premedical majors or persons interested in a career in medicine.

bined group and 36 were returned, for a faculty/resident response rate of 36.0%. Overall, therefore, the survey response rate was 59.6% (249/418).

Regardless of how questionnaires were physically distributed, members of all three groups of respondents were provided with oral informed consent, as approved by the University of California, Irvine's, Institutional Review Board (IRB), by having the study and its purpose thoroughly explained to them and then having the opportunity to elect not to participate in the study. The study's six-page questionnaire was developed by a multidisciplinary team, including an infectious disease and AIDS specialist, an internist/ethicist, and a health psychologist. A pilot study ($n = 25$) was conducted among students and residents, and wording of questionnaire items was modified based on their feedback. A decision was made not to ask respondents about their own sexual orientation, as this would have changed the study's status (based on IRB criteria) and may have prompted a requirement for written informed consent—something that would have been logistically very difficult given our planned use of grand rounds as a venue that would produce representative samples of residents and faculty physicians.

The questionnaire covered a broad range of attitudinal areas and knowledge questions, regarding HIV/AIDS, as well as items related to actual or anticipated patterns of clinical practice. As shown in the Appendix, a number of individual questionnaire items were combined to form scales, and these were subjected to reliability analysis. This analysis showed that all but one scale achieved an alpha reliability level of 0.7 or greater, which is considered to be optimal (the exception was "Personal Fear of HIV," with a reliability of 0.65).

For the first study question, trends in AIDS-related attitudes by level of professional training, categories of respondents by training level, served as the independent variable, with HIV and AIDS-related attitudes constituting the dependent variables. For the second study question, a scale based on questions eliciting expressed intent to provide care for HIV/AIDS patients constituted the dependent variable,

whereas all other relevant attitude scales and demographic characteristics served as independent variables.

As documented in the Appendix, intent to treat HIV patients (alpha = 0.82) is based on multiple statements drawn from the questionnaire. Similarly, professional misgivings regarding HIV (alpha = 0.78), personal fear of contracting HIV (alpha = 0.65), comfort with AIDS patients (alpha = 0.97), correct knowledge of saliva nontransmission (alpha = 0.75), comfort with HIV-positive providers (alpha = 0.82), support for routine HIV testing (alpha = 0.94), and comfort with serious illness (alpha = 0.77) are based on several questionnaire items each. Conversely, independent variables based on single-item measures include being tested for HIV, use of universal precautions, willingness to take risks, comfort with homosexual persons, having homosexual friends, and gender. Both scales and individual questionnaire items have been dichotomized into approximately equal (50:50) categorical measures, permitting analyses that compare proportions of individuals in the top half of each distribution, and enabling the use of odds ratios (in logistic regressions) contrasting these individuals with those in the bottom half of the distribution.

The third study question compares preclinical to clinical trainees to measure differences in the use of appropriate precautions versus overuse of protective measures, as a function of increased training and clinical exposure. Measures deemed appropriate in a series of questions concerning physical exams are documented in a table footnote, and the actual question is shown in the Appendix.

For the analysis of the impact of training and experience on AIDS-related attitudes and knowledge, the scales and questionnaire items listed in the Appendix were examined for trends across respondent groups using the Mantel-Haenszel test for linear association.[28] The examination of factors associated with intention to treat HIV and AIDS patients utilized multiple logistic regression,[29] which produces odds ratios that are similar to the risk ratios used in epidemiological research.[30] Finally, the examination of appropriateness of precautions between first-year medical students and third-

year students/residents employs the χ^2 test of significance.[31] In each case, the criterion for statistical significance is $p \leq 0.05$.

RESULTS

A comparison of the study's scales and individual questionnaire items (Appendix) by level of experience revealed significant trends for five of them, as shown in Fig. 1. (All variables are scored so that the higher the value, the more prevalent the attitude or characteristic.) The most highly significant ($p < 0.0001$) trend associated with greater training and experience was a decrease in perceived need for routine HIV testing of non–high-risk individuals. The figure also shows significant increases in the proportion of correct answers to questions on HIV transmission, a trend toward greater comfort with serious illness, and a decrease in both

professional (practice-related) misgivings and personal fear of HIV.

Study scales and questionnaire items were also compared by gender (54% of the respondents were male, 46% female). Results of this comparison (not tabled) show a significant difference only for agreement with the need for routine HIV testing of non–high-risk individuals, which was greater for females ($p < 0.001$).

The analysis of factors associated with intent to treat HIV and AIDS patients in respondents' medical practices utilized logistic regressions to examine (in turn) premedical college students, first-year medical students, and third-year medical students and medical residents (combined). The basis for these groupings was level of basic medical knowledge, coupled with the presence or absence of clinical exposure to HIV. The combining of third-year students and residents is based on previous data showing comparable levels of risk for occupational ex-
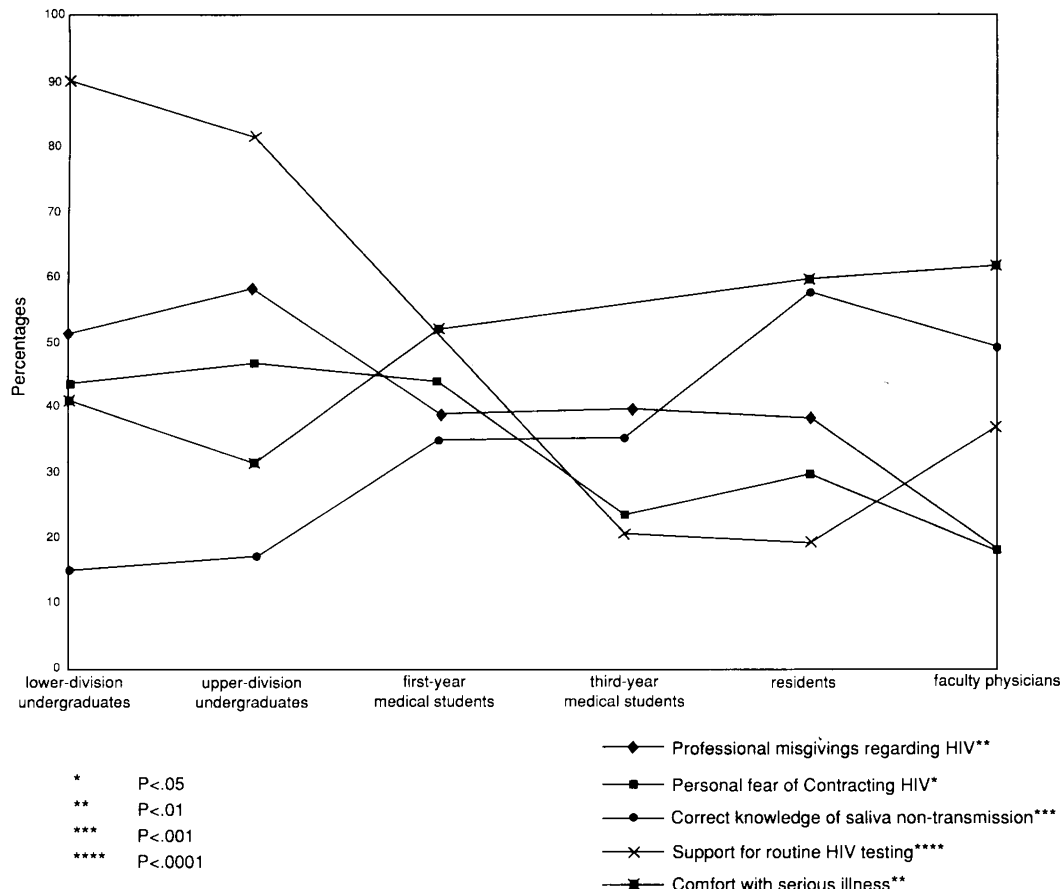

FIG. 1. Percentages for significant trends in HIV attitudes and knowledge, by level of training and experience.

posure to HIV,[11] and also results in a sufficient case base (*n*) for inclusion in the multivariate analysis. The intent to treat variable was examined using (unadjusted) bivariate regressions, and multivariate regressions, incorporating all factors that achieved a significance level of $p \leq 0.25$ in bivariate regressions.[29] The latter comparisons adjust simultaneously for effects of all other study variables entered into the multivariate regression equation.

Results of this analysis (Table 2) show a number of highly significant bivariate associations for college students and first-year medical students (with positively associated factors having odds ratios greater than one, negative factors showing odds ratios of less than one), but only personal fear of HIV and professional misgivings regarding HIV (respectively) remain significant when adjusted for other factors. Third-year medical students and residents generally have a lower significance level for potential predictive factors of their intention to treat HIV patients, and this is the only group for which comfort with HIV-positive providers and having homosexual friends were found to be associated with the intention to treat. (As noted above, respondents' own sexual orientations were not queried in the questionnaire.)

In Table 3, the appropriateness of precautions which respondents indicated they would use for a general physical examination of different categories of patients are compared between first-year medical students and third-year students/residents. Findings show that both for patients in HIV risk groups and for other categories of patients, potential use of excessive precautions decreases significantly once students/residents begin their clinical training years.

DISCUSSION

A 1990 national survey of primary care physicians (cited previously) showed that half would not treat people with HIV infection if they had a choice, but that more than two-thirds (68%) believed that they had a responsibility to do so.[3] This discrepancy is merely one example of the long-standing dilemma of physicians faced with an ethical obligation to provide care in the presence of personal risk due to contagion.[32] In the case of HIV disease, however, this long-standing dilemma is confounded by several unique features. In its initial stages, HIV was largely confined to relatively disenfranchised and stigmatized populations in our society: male homosexuals and intravenous drug users. Moreover, screening guidelines and reporting and confidentiality requirements have placed unique restrictions on practitioners and engendered a great deal of public controversy both within and outside the medical profession.

Findings from a previous (unpublished) study of residents in internal medicine produced findings that do not bode well for the medical profession, as they indicated that 63% were not planning to provide care for HIV patients.[33] Although a decade old, a definitive study of the impact of sexual orientation on willingness to treat—an issue we were not able to address—showed that homosexual physicians were substantially more likely to be willing to provide this care.[34] Findings from the present study somewhat ameliorate the kinds of concerns the former statistic for physicians in training might raise, however, as they indicate that both personal fear and professional misgivings regarding HIV decrease as students progress in their education and training, that both knowledge regarding HIV transmission and comfort (in general) with serious illness increase, and that the perceived need for routine HIV testing of non–high-risk individuals falls dramatically.

Postexposure prophylaxis (PEP) for HIV, provisionally endorsed by the Centers for Disease Control and Prevention (CDC) in 1996,[35] may have contributed to a secular trend toward increased willingness to treat HIV patients, but similar recommendations had been promulgated (at the institutional level) in one form or another for approximately 10 years prior to the issuance of more definitive CDC guidelines in 1998.[36] The 1996 provisional endorsement of PEP[35] is therefore not thought to have exerted a measurable impact upon respondents' willingness to treat, as measured in this study.

The study's findings lead us to conclude that willingness to treat HIV patients per se has not been shown to exhibit a significant trend within

TABLE 2. FACTORS ASSOCIATED WITH INTENT TO TREAT HIV AND AIDS PATIENTS

	Crude odds ratio (95% C.I.)		Adjusted odds ratio (95% C.I.)	
Premedical college students (n = 117)				
Professional misgivings regarding HIV	0.22***	(0.09–0.53)	0.76	(0.18–3.21)
Personal fear of contracting HIV	0.12	(0.05–0.31)	0.11**	(0.03–0.41)
Comfort with AIDS patients	3.69**	(1.50–9.07)	0.79	(0.16–3.95)
Correct knowledge of saliva nontransmission	3.47**	(1.47–8.18)	3.46	(0.98–12.24)
Comfort with HIV+ providers	1.88	(0.81–4.33)	1.19	(0.34–4.15)
Support for routine HIV testing	0.88	(0.28–2.77)	—[1]	—[1]
Comfort with serious illness	2.88**	(1.18–7.02)	2.10	(0.52–8.50)
Tested for HIV	3.25	(0.97–10.78)	3.27	(0.51–21.09)
Always use universal precautions	1.81	(0.82–4.03)	1.01	(0.26–3.88)
Willing to take risks	1.53	(0.66–3.56)	—	—
Comfort with gays	2.54*	(1.09–5.91)	0.53	(0.11–2.60)
Homosexual friends	2.11	(0.93–4.79)	1.31	(0.34–4.99)
Female gender	0.76	(0.34–1.66)	—	—
First-year medical students (n = 71)				
Professional misgivings regarding HIV	0.17**	(0.06–0.54)	0.12*	(0.02–0.79)
Personal fear of contracting HIV	0.09****	(0.03–0.28)	0.48	(0.09–2.46)
Comfort with AIDS patients	8.61****	(2.84–26.15)	6.21	(0.64–60.34)
Correct knowledge of saliva nontransmission	0.72	(0.24–2.13)	—	—
Comfort with HIV+ providers	1.46	(0.53–4.01)	—	—
Support for routine HIV testing	0.54	(0.20–1.42)	0.73	(0.13–4.12)
Comfort with serious illness	8.80****	(2.88–26.84)	3.13	(0.36–27.19)
Tested for HIV	1.15	(0.43–3.10)	—	—
Always use universal precautions	1.13	(0.44–2.92)	—	—
Willing to take risks	4.20**	(1.47–11.97)	2.76	(0.46–16.76)
Comfort with gays	6.15***	(2.16–17.46)	1.19	(0.20–7.02)
Homosexual friends	1.21	(0.44–3.33)	—	—
Female gender	1.00	(0.38–2.63)	—	—
Third-year medical students and residents (n =45)				
Professional misgivings regarding HIV	0.17	(0.04–0.74)	0.23	(0.03–1.69)
Personal fear of contracting HIV	0.43	(0.10–1.89)	—	—
Comfort with AIDS patients	3.46	(0.96–12.48)	0.48	(0.06–3.77)
Correct knowledge of saliva nontransmission	1.07	(0.28–4.05)	—	—
Comfort with HIV+ providers	8.75*	(1.66–46.06)	4.13	(0.52–33.08)
Support for routine HIV testing	0.71	(0.15–3.38)	—	—
Comfort with serious illness	1.70	(0.49–5.93)	—	—
Tested for HIV	0.55	(0.16–1.92)	—	—
Always use universal precautions	0.96	(0.28–3.22)	—	—
Willing to take risks	6.25*	(1.04–37.68)	8.71	(0.58–130.19)
Comfort with gays	5.00*	(1.33–18.82)	2.82	(0.40–19.77)
Homosexual friends	5.52*	(1.41–21.65)	3.59	(0.47–27.25)
Female gender	3.33	(0.87–12.72)	1.19	(0.15–9.49)

*, $p < .05$; **, $p < .01$; ***, $p < .001$; ****, $p < .0001$.
[1]Factors with crude (unadjusted) p values ≤ .25 are entered into multivariate regression equation.

this cross-sectional sample, consistent with previous studies that suggest education alone may not be effective in increasing willingness to treat.[17,37] On the other hand, as students at our institution progress from college to preclinical medicine, and on to clinical medicine and residency training, fewer attitudinal factors remain significant predictors of their intent to treat HIV and AIDS patients, and clinical training and experience leads to more accurate identification of appropriate personal precautions during physical exams for patients in various categories. The present study therefore provides evidence that, despite potential conflicts between physicians' professional obligations to patients and their freedom of choice with regard to providing care to individuals,[38] the knowledge and values inculcated over the course of clinical training appear to diminish the impact of many of the factors associated with reluctance to treat HIV patients.[2,3,39] However, it remains clear that attitudes towards ho-

TABLE 3. APPROPRIATENESS OF PRECAUTIONS INDICATED FOR A GENERAL
PHYSICAL EXAMINATION BY PRECLINICAL VERSUS CLINICAL RESPONDENTS

Appropriateness of precautions used for a patient who	First year medical students (preclinical), %	Third year students and residents (clinical), %	Statistical significance, p
Is coughing[1]			
Appropriate	18.2	62.2	<0.00001
Slightly inappropriate	14.5	26.7	
Inappropriate	67.2	11.1	
Total	100.0	100.0	
Is homosexual[2]			
Appropriate	28.6	82.2	<0.00001
Slightly inappropriate	46.4	17.8	
Inappropriate	25.0	0	
Total	100.0	100.0	
Has end-stage renal disease[2]			
Appropriate	38.0	86.7	<0.00001
Slightly inappropriate	40.0	11.1	
Inappropriate	22.0	2.2	
Total	100.0	100.0	
Is an intravenous drug user[2]			
Appropriate	20.4	73.3	<0.00001
Slightly inappropriate	53.7	26.7	
Inappropriate	25.9	0	
Total	100.0	100.0	
Has a weepking skin eruption[3]			
Appropriate	58.9	88.9	0.001
Slightly inappropriate	17.9	0	
Inappropriate	23.2	11.1	
Total	100.0	100.0	
Has diarrhea[2]			
Appropriate	27.8	59.1	0.004
Slightly inappropriate	59.3	38.6	
Inappropriate	13.0	2.3	
Total	100.0	100.0	

[1]Coded as follows: no devices worn = appropriate; mask = slightly inappropriate; gown or mask and goggles (with or without gloves) = inappropriate.

[2]Coded as follows: no devices worn = appropriate; gloves = slightly inappropriate; any other devices = inappropriate.

[3]Coded as follows: gloves = appropriate; gloves and gown = slightly inappropriate; no devices worn, or gown and/or goggles (with or without gloves) = inappropriate.

mosexuals are an enduring feature of the predilection to treat HIV and AIDS patients, as suggested elsewhere.[37]

The study's limitations center on the fact that samples for all respondent groups were drawn from affiliates of just one university. We recognize that what individuals state they will or will not do in response to hypothetical questions in a survey is not always what they do or do not do in actual practice. Thus, it will be of interest and importance to track the care that this generation of students and residents will actually provide for HIV patients in the future.

ACKNOWLEDGMENT

APPENDIX: STUDY VARIABLES

A. Scales

1. Intent to treat HIV/AIDS patients ("Intent to Treat HIV"). Score based on disagreement with two statements; agreement with a third statement (alpha reliability 0.82).
   - If I were a student or resident, and if I were given the option, I would rather not care for HIV-positive patients.
   - If it were ethically acceptable, and if I were a physician in practice under nonemergency circumstances, I would rather not care for HIV-positive patients.
   - I have an obligation within my field of medical expertise to care for patients with AIDS.
2. Professional misgivings concerning the impact of HIV on medical practice ("Professional Misgivings Regarding HIV"). Score based on agreement with five statements (alpha reliability 0.78).
   - By seeing patients with HIV in my office, I fear my staff or coworkers would be at risk.
   - My attending patients with HIV would not be fair to my family.
   - My attending patients with HIV would not be fair to other patients in my practice.
   - If they found out I treated HIV-positive patients, other patients would leave my practice.
   - I would lose referrals if other physicians knew I treated patients with HIV infection.
3. Personal fear of contracting HIV ("Personal Fear of Contracting HIV"). Score based on agreement with two statements (alpha reliability 0.65).
   - I am more afraid of contracting HIV from patients than I need to be based on the known risk of transmission.
   - In attending patients with HIV, I am fearful of personally contracting the virus.
4. Comfort with HIV-positive and AIDS patients ("Comfort With AIDS Patients"). Score based on "Quite Comfortable" answers to two statements (alpha reliability 0.97).
   I feel quite comfortable, somewhat comfortable, neither comfortable nor uncomfortable, somewhat uncomfortable, very uncomfortable with. . . .
   - Patients who are HIV-positive
   - Patients with AIDS
5. Correct knowledge of non-transmission of HIV virus by means of saliva ("Correct Knowledge of Saliva Nontransmission"). Score based on disagreement with two statements (alpha reliability 0.75).
   - Saliva or sputum (material coughed up) from AIDS patients has transmitted HIV infection to health care works.
   - Saliva or sputum from AIDS patients has transmitted HIV infection to household members of AIDS patients.
6. Comfort with HIV-positive health care providers ("Comfort with HIV-Positive Providers"). Score based on four questions concerning the willingness to continue under the care of a personal physician, dentist, surgeons, or (own or spouse's) obstetrician if it were learned that person was HIV-positive (alpha reliability 0.82). Responses for each:
   - Continue under his/her care without fear.
   - Continue under his/her care but with anxiety.
   - Seek another provider.
7. Support for routine HIV testing ("Support for Routine HIV Testing"). Score based on agreement with the need for routine HIV testing of nine categories of non–high-risk individuals (alpha reliability 0.94). This question did not ask about the need for HIV testing of transfusion recipients, gay or bisexual patients, intravenous drug users, and other high-risk groups. Categories were:
   - Hospitalized patients

- Patients who are to have surgery
- All patients
- All physicians
- All surgeons
- All dentists
- All nurses
- All school teachers
- All food handlers

8. Comfort with other (non-HIV) seriously ill patients ("Comfort with Serious Illness") Score based on answers to three statements (alpha reliability 0.77).

I feel quite comfortable, somewhat comfortable, neither comfortable nor uncomfortable, somewhat uncomfortable, very uncomfortable with. . . .

- Patients with terminal illnesses
- Patients with hepatitis
- Patients with active tuberculosis

B. Individual questionnaire items used as study measures

1. "Tested for HIV"
   I have/have not been tested for HIV antibody. (Percentage tested)
2. "Always use universal precautions"
   I practice universal body substance precautions always/usually/sometimes rarely. (Percentage always)
3. "Willingness to take risks"
   I would be willing to care for patients with a contagious disease even though my risk of acquiring the disease and dying within 10 years would be: 1 in 2, 1 in 10, 1 in 100, 1 in 1,000, 1 in 10,000, 1 in 100,000. (Percentage willing to provide care at greater than 1 in 100,000 risk)
4. "Comfort with gays:
   I feel quite comfortable, somewhat comfortable, neither comfortable nor uncomfortable, somewhat uncomfortable, very uncomfortable with persons who are gay. (Percentage who feel quite comfortable)
5. "Homosexual friends"
   Do you have any friends or relatives who are homosexual or bisexual? (Percentage Yes)
6. Gender (Respondents' sexual preference was not asked.)
7. Level of training: Six categories (college, freshmen/sophomores, junior/seniors, first-year medical students, third-year medical students, resident physicians, faculty physicians); vs. three categories for fear of HIV and intent to treat (college students, first-year medical students, third-year medical students and residents); vs. two categories for appropriate precautions (first-year medical students, third-year medical students and residents).

C. Appropriate precautions questions

Assuming I do not have cuts on my hands, when doing a general physical examination (without a pelvic or rectal exam) I use the following: gloves, mask, gown, goggles, or none of these . . . for a patient who:

- is coughing
- is homosexual
- had end-stage renal disease
- is an IV drug user
- has a weeping skin eruption
- has diarrhea

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