

cut. Recent evidence about the effectiveness of pentamidine chemoprophylaxis in preventing development of *Pneumocystis carinii* pneumonia (6) and zidovudine (AZT) in delaying onset of AIDS (3) indicate the desirability of identifying HIV infection early and getting those who are HIV-infected into a continuing, comprehensive program of medical care and social support. These programs also provide opportunities for continued risk reduction counseling and reinforcement. These programs are not yet developed in many areas; however, the recently enacted Comprehensive AIDS Resources Emergency (CARE) Act of 1990 provides a mechanism for their establishment.

Over time, our prevention activities will continue to evolve and become more effective. We believe our approach is sound and critically important to the nation's health.

AIDS Knowledge in Low-Income and Minority Populations

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Synopsis

A convenience sample of 587 subjects was se-

THE NUMBER OF BLACKS and Hispanics who contract acquired immunodeficiency syndrome (AIDS) is disproportionately high relative to their

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lected from the waiting areas of community health centers in Harris County, TX. They completed a structured interview that included questions on their knowledge of acquired immunodeficiency syndrome (AIDS) transmission and prevention. Hispanic patients were interviewed in their preferred language. They were given a cumulative correct score for 10 questions on AIDS.

An ANOVA showed significant differences in knowledge between each racial group. Cumulative scores were whites, 78 percent correct; blacks, 68 percent correct; and Hispanics, 61 percent correct. Only 58 percent of Hispanics reported that using a condom during sexual intercourse lowered the risk of contracting AIDS, compared with 84 percent of whites and 83 percent of blacks. A regression analysis showed significant effects for both education and racial group, but not for age and sex. These findings show that knowledge of AIDS can be predicted according to the race and education of the population using these community health centers. Additional attention should be focused on educating low-income blacks and Hispanics about AIDS.

proportion of the population. Twenty-six percent of U.S. AIDS patients are black, and 13 percent are Hispanic. In the U.S. population, the propor-

Table 1. Percentage of correct answers on AIDS by racial group

Question	White	Black	Hispanic	White-Black	White-Hispanic	Black-Hispanic
Can people get AIDS from a blood transfusion at a hospital?	96.5	92.0	89.4	...	(¹)	...
Can people get AIDS by sharing needles with a drug user who has the disease?	97.2	96.0	93.5
Can people get AIDS by shaking hands with someone who has it?	90.9	79.5	75.8	(¹)	(¹)	...
Can having sexual intercourse with someone who has AIDS be one way of getting it?	97.9	98.0	96.9
Can people get AIDS by eating food cooked by a person with AIDS?	74.8	52.7	52.3	(¹)	(¹)	...
Can people get AIDS from a mosquito bite?	40.6	39.3	32.1
Can people get AIDS by being coughed or sneezed upon by someone with AIDS?	62.7	40.9	32.8	(¹)	(¹)	...
Can people transmit AIDS without having had it? ..	43.4	19.3	10.3	(¹)	(¹)	...
Can just being around someone with AIDS give you the disease?	91.6	77.3	65.2	(¹)	(¹)	(¹)
Does using a condom during sex lower the risk of AIDS?	84.5	83.3	57.7	...	(¹)	(¹)
Total	78.4	68.1	60.7	(¹)	(¹)	(¹)

¹ Pairs of groups significantly different at the 0.05 level.

Table 2. Correlation matrix with knowledge, race, sex, age, and education ¹

Variable	Knowledge (total)	Black	Hispanic	Sex	Age	Education
Knowledge (total)	1.000					
Black	0.032	1.000				
Hispanic	-0.307	-0.588	1.000			
Sex	0.081	0.084	-0.190	1.000		
Age	-0.052	0.114	-0.105	-0.022	1.000	
Education	0.382	0.263	-0.501	0.207	-0.069	1.000

¹ Knowledge mean for 10 questions = 6.692; standard deviation (SD) = 2.070

tion of blacks is 12 percent, and of Hispanics, 6 percent (1).

Relative risk is also a function of the category of exposure. The proportion of blacks and Hispanics who contract AIDS directly or indirectly from intravenous drug abuse is substantially greater than among whites (1,2). The proportion of minorities contracting AIDS is also greater among those cases associated with male homosexuality and bisexuality (2). In addition, minorities constitute 78 percent of all children with AIDS and 71 percent of all women with AIDS (3).

These data on the differential impact of AIDS highlight the importance of prevention of AIDS among minority populations. Education has been advocated as an important means for preventing AIDS, including targeting of black and Hispanic communities for special preventive messages (2,3). However, there is little information on their knowledge and sources for information on AIDS among

minority populations or on factors that might predict knowledge among these populations (4,5). Although Hispanics' level of AIDS knowledge has been surveyed (6), the socioeconomic status of this study group was not made clear. Nor are there reports, as far as we know, that establish whether race or ethnicity alone is predictive of AIDS.

The primary purpose of this study was to assess racial or ethnic differences in knowledge of AIDS transmission and prevention, as well as to assess how other factors such as age, education, and sex relate to knowledge. Reported sources of information on AIDS were also obtained for each racial group.

Method

Subjects were selected from four of the eight medical school-affiliated community health centers in the Harris County, TX, hospital district. Male

and female patients or relatives of patients, ages 18 and older, were selected at random from the centers' waiting rooms and were asked for their cooperation and informed consent. Interviews took place over a 3-month period starting October 1987. Three interviewers were used—one man and two women. Hispanic subjects were interviewed in their preferred language.

The interview included questions on demographic information, knowledge, and sources of information on AIDS and preventive attitudes and practices. The interview schedule was structured and kept simple. Most often subjects were asked to choose among "yes," "no," and "don't know" responses. Each subject received a score (correct, incorrect) for each item of knowledge of AIDS, as well as a total score indicating the percentage of correct answers for all knowledge questions. The standard of knowledge against which subjects were compared was that of the Surgeon General's report on AIDS (7). Subjects were also asked to select the three most frequent sources of information on AIDS from a list of possibilities.

Description of Sample

Those subjects interviewed totaled 587—58 white men, 85 white women, 53 black men, 98 black women, 62 Hispanic men, and 231 Hispanic women. Of them, 71 percent of the sample were patients at the clinic; the remainder included relatives, friends, and family members. Of all subjects, 75 percent had visited the clinic more than once. The mean age was 33.2 years for whites, 35.2 years for blacks, and 31.7 years for Hispanics, with an overall age range of 15 to 66 years. The mean grade level of education completed was 11.7 for whites, 11.4 for blacks, and 8.1 for Hispanics. The most common religious affiliations identified by all groups were Baptist and Catholic. Of whites, 14 percent admitted to a history of intravenous drug abuse compared with 7 percent of blacks and 3 percent of Hispanics. Seventy-two percent of whites reported that they had had sexual intercourse within the previous 3 months, compared with 78 percent of blacks and 80 percent of Hispanics. Fourteen percent of whites said they knew someone with AIDS, compared with 9 percent of blacks and 3 percent of Hispanics.

Results

One hundred percent of both whites and blacks said they had heard of AIDS, and 99 percent of

'Questions answered correctly most often by all groups were that people could get AIDS (a) from a blood transfusion at a hospital, (b) by sharing needles with a drug user who had AIDS, and (c) by having sexual intercourse with someone who has AIDS.'

Hispanics said they had heard of it. Racial differences were found for correct answers to questions on AIDS knowledge; whites tended to score better than blacks, who in turn tended to score better than Hispanics (table 1). Questions answered correctly most often by all groups were that people could get AIDS (a) from a blood transfusion at a hospital, (b) by sharing needles with a drug user who had AIDS, and (c) by having sexual intercourse with someone who has AIDS. Questions answered correctly least often by all groups were (a) they could get AIDS from a mosquito bite, and (b) people can transmit AIDS without having had it.

Differences in knowledge between whites and blacks reached significance for 5 of the 10 questions and between whites and Hispanics for 7 of the 10 questions. Hispanics scored significantly lower than blacks for 2 of the 10 questions. White subjects scored an average of 78 percent correct (SD=17); blacks, 68 percent correct (SD=20); and Hispanic, 61 percent correct (SD=21). The difference among the three groups was significant ($F=39.620$, $df=2$, 573, $P<0.001$). The Sheffe multiple range test indicated that both blacks and Hispanics scored significantly lower than whites, and that Hispanics scored significantly lower than blacks.

A multiple regression program with cumulative scores of knowledge entered as the dependent variable was used to identify the best predictors (table 2). Age and years of formal education were entered as continuous variables, and sex was entered as a binary variable. Because race was trichotomized, it was entered as two binary variables (8). A high zero order correlation was found for being Hispanic (-0.307), with this being associated with less knowledge. A high zero order correlation was also found for the association between education and knowledge (0.382).

Because of multicollinearity of the black and Hispanic variables, the black variable was dropped

Table 3. Multiple regression of knowledge with race, sex, age, and education

Variable	B	Standard error of B	Beta	Significance of t
Hispanic.....	-0.681	0.186	-0.165	<0.001
Sex.....	-0.061	0.178	-0.014	NS
Age.....	-0.009	0.007	-0.049	NS
Education.....	0.178	0.027	0.299	<0.001
Constant.....	5.620	0.442	...	<0.001

R=0.407; R²=0.166; F=28.365; df=5, 569; P<0.001

NOTE: B = regression coefficient; t is a test of the regression coefficient; NS = not significant.

Table 4. First choice of 558 clinic patients for source of information on AIDS by racial group (percentages)¹

Category	White (N=143)	Black (N=137)	Hispanic (N=278)	χ ² (df=2)	Significance
Friends.....	2	6	30	3.02	NS
Relatives.....	3	4	1	(²)	(²)
Newspaper.....	22	16	8	17.709	<0.001
Pamphlets.....	6	7	7	0.245	NS
Physician or nurse.....	3	2	3	(²)	(²)
Television.....	62	64	71	3.470	NS
Radio.....	1	1	8	(²)	(²)

¹ 29 subjects (5 percent) did not specify a first choice.

² The expected frequencies fell below 5 for >20 percent of the cells, making the computation of chi-squares inappropriate.

NOTE: df = degrees of freedom; NS = not significant.

and the stronger Hispanic variable was retained. Together, the remaining variables (Hispanic, sex, age, and education) accounted for 16.6 percent of the variance (table 3). Education had the greatest positive effect on knowledge (beta=0.299, B=0.178, P<0.001); being Hispanic had a negative effect on knowledge (beta=-0.165, B=0.681, P<0.001). Sex and age did not have significant effects on knowledge. An ANOVA was done to ascertain the existence of an interaction effect between race and sex, but no significant interaction was found.

Sources of information on AIDS by ethnicity are provided in table 4. Most frequent sources were the television for all groups, followed by the newspaper for whites and blacks, and both the newspaper and radio for Hispanics. At the time of the study, there were at least three Spanish-only radio stations broadcasting in the county. One trend was that Hispanics were more likely to report using the television as the primary media source. However, a significant difference was that Hispanics were less likely than the blacks who, in turn, were less likely

than whites to report using the newspaper. Relatives and physicians or nurses were listed as sources of information least frequently. When subjects who had visited the health center more than once were asked whether anyone in the center had talked to them about AIDS, 5 percent of whites said yes compared with 7 percent of blacks and 2 percent of Hispanics.

Discussion

Race-ethnicity was found to be predictive of AIDS knowledge in the socioeconomic group that used these community health centers. Hispanics knew significantly less than blacks who, in turn, knew less than whites. The range of knowledge was found to be considerable between questions. More than 90 percent of each racial group correctly answered questions on AIDS transmission by needle sharing and sexual intercourse. However, more than 50 percent of blacks and Hispanics incorrectly answered questions on transmission of AIDS by mosquito bites and by coughing and sneezing.

Regarding AIDS prevention, about 15 percent of whites and of blacks did not answer correctly that condoms used during sex lowers the risk of AIDS, and more than 40 percent of Hispanics answered incorrectly. This finding is consistent with a previous finding that only 50 percent of Hispanics thought condoms could prevent transmission (6).

A study recently completed by Susan Baker, PhD, and colleagues of Baylor's Department of Community Medicine and the University of Texas School of Public Health showed that as many as 70 percent of all people below 150 percent of poverty level do not use the primary care facilities. It should be realized that these findings cannot be generalized to the general population at the low socioeconomic level. Further research is needed to determine if the quality of AIDS knowledge noted in our study is consistent with the low socioeconomic minority groups not using community health centers.

This sample was selected in part because it was considered to be accessible to an educational intervention in a medical facility, such as a community health center. The flow of subjects made strict random sampling unfeasible. While this selection process might compromise the generalizability of the study to a broader population, steps were taken, such as the use of bilingual interviewers and the inclusion of nonmedically ill subjects, to limit adverse effects. Although it is clear that other steps in addition to dissemination of information are

necessary to bring about behavior change (9), AIDS knowledge must be considered a necessary factor to prevent human immunodeficiency virus (HIV) transmission. These findings show the need for special educational efforts directed to blacks and Hispanics, because of their being more likely to contract HIV infection (1).

The finding that race predicts AIDS knowledge may be explained by the language barrier that prevents many Hispanics from utilizing AIDS information effectively. There was also a trend for Hispanics to be more likely to report television as the primary media source for information on AIDS, and for blacks and Hispanics to be less likely to report using the newspaper. Information provided by television might be of a different order than that provided by newspapers, and it might be more likely to include news items rather than instructions on how to prevent HIV infection. Alternatively, blacks and Hispanics may not perceive AIDS as having the same threat or salience as for whites.

Education was also found to predict AIDS knowledge independently. Those with fewer years of schooling also warrant special attention for AIDS education. Less schooling may relate to a reduced ability to apply information. Alternatively, a higher education may be linked to some factor such as higher income which, in turn, relates to AIDS knowledge. Age and sex were not found to predict AIDS knowledge.

Information on AIDS must be disseminated in a form that is understandable and through a source that is used by minority populations. Currently, television is the most used media to disseminate AIDS information to all racial groups.

Community clinic workers, including primary care physicians, also have an opportunity to educate members of minorities who use primary care facilities, and whose access into the American health care system is limited (10). This opportunity ought to be acted on with this population.

Significantly, however, less than 5 percent of both black and Hispanic patients reported talking about AIDS with anybody at the clinics. These findings show that research is needed that clarifies the impact of different methods of providing AIDS information on minorities' knowledge and preventive behavior. Research is also needed to measure the effectiveness of interventions designed to increase clinic workers' educational involvement with minority patients.

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