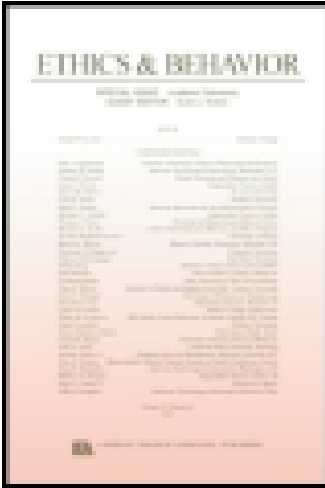


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Efficacy of an Educational Intervention to Increase Consent for HIV Testing in Rural Appalachia

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This study sought to assess barriers and enhance readiness to consent to home and Planned Parenthood HIV testing among 60 out-patients from a mental health and substance abuse clinic in rural Appalachia. Testing barriers included not knowing where to get tested, lack of confidentiality, and loss of partners if one tested sero-positive. The intervention yielded lowered HIV stigma, increase in HIV knowledge, and agreement to take the HIV home test. These results are encouraging because they suggest that a brief educational intervention is a critical pathway to the success of the National Institutes on Drug Abuse's Seek, Test, Treat, and Retain initiative in poor rural counties.

Keywords: informed consent, HIV testing, Appalachia, intervention, drug use, home testing

It is estimated that 1.3 million persons are living with HIV/AIDS in the United States and nearly 85,000 are living outside metropolitan statistical areas (< 50,000 population; Centers for Disease Control and Prevention [CDC], 2014a). In 2011, 3,276 individuals received an HIV diagnosis while living in a nonmetropolitan community, representing 6.6% of the diagnoses that year alone (CDC, 2014a). Although HIV incidence and prevalence remains higher in large urban areas, the HIV and AIDS rates in rural areas in the United States continue to increase, especially in the southeastern states, the Mississippi Delta region, the U.S.–Mexico Border, and in Appalachia (Hall, Li & McKenna, 2005).

The CDC estimates that 16% of the Americans who are HIV positive do not know their status; therefore, the identification of individuals infected with HIV is the crucial first step in slowing HIV transmission in the United States, especially among high-risk groups, including substance abusers (CDC, 2013). The National Institutes on Drug Abuse (NIDA) Seek, Test, Treat, and Retain (STTR) model of care involves research documenting effective interventions that engage hard-to-reach drug-abusing groups in HIV testing and initiating and retaining those who test

positive in treatment (NIDA, 2012). This model of care is based on research demonstrating that expanding HIV testing and reducing viral load among HIV+ individuals through HAART therapy can be effective in reducing the HIV transmission at a population level.

Implementing STTR is particularly challenging in rural Appalachia. The Appalachian Regional Commission (ARC) defines Appalachia as a 205,000-mile square region that includes all of West Virginia and part of 12 U.S. states, including Southeastern Ohio (ARC, 2014b). About 25 million people live in 420 counties in the Appalachian Region (ARC, 2014b), including 2 million Ohioans who live in 32 counties (Ohio Department of Development, 2013). Forty-two percent of Appalachian residents live in rural areas compared to 20% of the general U.S. population, and many individuals live in remote areas, miles from a major metropolitan area (ARC, 2014b). Rural Appalachians tend to have higher poverty rates, less education and literacy, less nutritional diets, and riskier health behaviors than their urban counterparts (Wewers, Katz, Fickle, & Paskett, 2006). In addition, rural Appalachians often lack access to nearby health care services, making it difficult for them to receive proper preventive and restorative treatment. In 2011, the Health Cost Coverage and Access Index, which measures health care cost, coverage, and availability of health care resources in the Appalachian region to other parts of the United States, reported that the counties with the lowest quintiles of index scores, or “well-below the national average,” were in rural central Appalachian Region (ARC, 2012).

The most recently published Appalachian HIV/AIDS data reported that 2,251 individuals received an HIV or AIDS diagnosis while living in a designated Appalachian County (Hall et al., 2005). However, this number was not reflective of all HIV cases because Kentucky and Tennessee did not have name-based HIV reporting at the time of the report (Hall et al., 2005). The most recent HIV/AIDS statistics for the state of Ohio indicate that 17,926 individuals are living with HIV/AIDS in the state and that approximately 804 (4.5%) are living in Appalachian Ohio counties (Ohio Department of Health, 2013). Although reported HIV/AIDS rates are lower in Appalachian Ohio than in the urban areas, the rates are not entirely accurate, because Ohio counties with fewer than 10 cases are not required to report their cases to the Ohio Department of Health and many Appalachian Ohioans do not know their HIV status. In rural Appalachia, opioid use has increased steadily in the past decade, and research suggests that opioid use often quickly escalates to injection drug use (Young & Havens, 2012). Therefore, given the high prevalence of prescription and opioid drug abuse in Appalachian Ohio, West Virginia, and Kentucky, it is likely there will be a large increase in the number of injection drug users in the central Appalachian region who will be at increased risk for contracting and transmitting HIV, many of whom will not be aware of their HIV status.

The continued increase in drug use and other HIV risk behaviors endemic in poorer counties of Appalachia give urgency to implementation of STTR. However, given the unique geographic constraints and cultural factors in Appalachia, implementing STTR and CDC testing recommendations in rural Appalachia is difficult. For example, in addition to burdens produced by long-distance travel to testing sites, previous experiences with poor medical services, general mistrust of health research and services, misconceptions about HIV transmission and acquisition, and high levels of HIV-related stigma, may contribute to negative attitudes toward HIV testing (Basta & Vance, 2010; Blendon et al., 2007; Fisher, 2010; Fisher & Wallace, 2000; Stangel, Lloyd, Brady, Holland, & Baral, 2013; Vance & Basta, 2010).

Home-based testing offers a new opportunity for HIV testing accessibility and privacy and thus may be one solution to testing reluctance based on HIV stigma. Currently, there is a dearth

of research related to home HIV testing in the United States, and specifically in the Appalachian region, but it appears that the home HIV testing kit has the potential to increase HIV testing by reducing the stigma as it did in Africa (Low et al., 2013) as well as increase accessibility for many of rural individuals living in the region. However, without interventions designed to increase health literacy about HIV acquisition and transmission (Brooks, Newman, Duan, & Ortiz, 2007; Fisher, 2010) and the safe and private nature of home testing, rural Appalachians may not avail themselves of the health opportunities afforded by this new mode of testing.

The primary purpose of this study was to generate preliminary data on institutional and psychosocial barriers to HIV testing and the effectiveness of a brief educational intervention to enhance consent readiness and participation in a study offering home or Planned Parenthood HIV testing within a high-risk population of rural Appalachians. At the time of this study, Planned Parenthood offered the only community HIV testing in the town where the study was conducted. Furthermore, the only method of HIV testing offered at Planned Parenthood was the \$25 rapid finger blood stick, which was done by appointment only. The only other option, besides getting tested at a physician's office, was to buy the new Oraquick rapid self-test that was approved by the FDA in 2012. The retail cost at the time of the study ranged nationally from \$40 to 60 per kit, with an average of \$39.99 at the local Athens County Walmart and CVS drug stores.

METHODS

Participants

Recruitment was conducted through signs posted at the Tri-County Mental Health and Counseling, Inc., a nonprofit organization that serves individuals affected with mental illness and alcohol, tobacco, and drug addiction in Athens County, Ohio. The signs provided a number to call for an appointment. To be eligible to participate in this study, participants had to satisfy the following inclusion criteria: (a) 18 years of age or older, (b) HIV negative or unaware of their HIV status, and (c) reside in an Appalachian county in Ohio (ARC, 2014a). Individuals who called were screened for eligibility and those who were eligible were given a time and date to participate in the study. A total of 60 individuals met inclusion criteria. Demographic information is provided in the Results section.

Research Design

Procedures and materials were revised for content and clarity following discussions with our Community Advisory Board (CAB) consisting of two case managers from Tri-County Mental Health and three current clients of the organization reviewed all materials. The three CAB participants, who were clients, agreed to participate as research participants the following week, and this allowed for additional improvements in the instruments. All CAB members were compensated \$50 for each day of participation. The study was approved by the Institutional Review Board at Ohio University and by Planned Parenthood of Greater Ohio and proceeded in four iterative stages: (a) preintervention assessment of HIV testing barriers including previous health care experiences, HIV knowledge and attitudes toward testing, and HIV stigma; (b) administration of a brief educational presentation designed to enhance informed consent for HIV testing;

(c) postintervention assessment of HIV knowledge, attitudes, and stigma and its relationship to willingness to be tested; and (d) decision of participants to self-administer a free HIV-testing kit on site or obtain free testing at a local Planned Parenthood.

MEASURES

Preintervention Assessment Questions

Demographic Information and Health Care Experiences

Demographic information was collected for each participant on gender, age, race, living situation, employment status, educational background, income, relationship status, sexual orientation, and county of residence. Each participant was asked to answer questions regarding their most recent health examination and to complete a five-item modified health disparities questionnaire that used a 4-point Likert-type scale to assess agreement/disagreement with reasons they had previously received poor quality health care, including racial/ethnic discrimination, inability to pay for care, rejection because of type of insurance, and do not offer needed health services (Blendon et al., 2007).

HIV-risk Behaviors

Data were collected on drug use and sexual behavior. Individuals were asked to disclose types of drugs used in the prior 30 days, as well as whether they used condoms during current sexual behavior and whether they had ever had sexual intercourse with someone who was HIV positive or an intravenous drug user.

Prior History of HIV Testing

Participants responded yes or no to questions on whether they had ever been tested for HIV, whether they planned to get an HIV test in the future, whether they had heard of the over-the-counter oral HIV self-test (Oraquick), and whether they had purchased an over-the-counter oral HIV self-test in the past. They were also asked how much they worried about getting HIV and responded with “a lot,” “somewhat,” or “not at all.”

Barriers to HIV Testing

Participants responded “yes/no” or “not sure” to 11 items that measured barriers to HIV testing, including lack of transportation to testing site; not knowing where to get tested; not enough time to get tested; site is too far away; worried about getting results; worried that AIDS has no cure so why get tested; worried about being recognized at site; worried about confidentiality of results; and afraid of losing job, partner, and/or health insurance. In Appalachian culture, it is hard for individuals to admit something is a problem; we coded “unsure” and “yes” items as indicating some barrier level. The wording for all of the barriers to testing items is provided in [Table 2](#) in the Results section.

Pre- and Posteducational Intervention Test Questions

HIV Knowledge

Twenty items assessed HIV knowledge before and following the HIV testing enhancement intervention. Sixteen items were drawn from Hou's (2004) objective and subjective HIV knowledge scale composed of 11 items assessing knowledge relating to specific forms of HIV acquisition and transmission and five items on HIV testing. Four additional items drawn from studies of HIV vaccine consent readiness were also included (Brooks et al., 2007; Fisher, 2010). Exact wording of each item is presented in Table 3. Participants could respond "true," "false," or "not sure" for each item. Items were coded as 1 for correct answer and 0 for incorrect or unknown.

HIV Mistrust

This four-item scale adapted from Brooks et al. (2007) and Fisher (2010) measured HIV mistrust as true (score = 1) or as false or not sure (score = 0). Items included HIV is manmade, a vaccine exists, a cure exists, and the health department is working to prevent the spread of disease.

HIV Stigma

Nine Likert scale items, ranging 1 (*strongly disagree*) to 4 (*strongly agree*), were adapted from a national AIDS and stigma survey (Herek, Capitano, & Widaman, 2002) to assess attitudes toward individuals living with HIV/AIDS. Internal consistency in our study was .70 on the pretest and .65 on the posttest.

HIV Testing Decisions

Following the educational intervention and posttest survey, participants were asked if they would like to be tested on the premises using the Oraquick self-test or receive a coupon for free testing at a local Planned Parenthood. Regardless of test site chosen, four questions were asked of those participants who agreed to testing immediately after they completed the HIV test. The first question asked about satisfaction with the test, from 1 (*not at all satisfied*) to 4 (*very satisfied*). The second question addressed self-efficacy by asking how confident the participant was that he or she can get tested for HIV in the future, from 1 (*not at all confident*) to 4 (*very confident*). Finally, participants were asked two open-ended responses about why they were or weren't satisfied with the chosen method of HIV test and whether they would be likely to have a similar test in the future (either buy and use self-test or go to Planned Parenthood again).

Procedure

Upon arrival for their appointment, individuals were greeted in the Tri-County lobby and taken to a private meeting room. In the room, each participant had the informed consent read to them. Participants then completed preintervention demographic, risk-behavior, health care, HIV general

and testing knowledge, mistrust and stigma questionnaires either on their own or with reading assistance from a research staff member. The educational module was delivered via laptop computer by the third author, who has extensive HIV nursing experience.

HIV Enhancement Presentation

The educational materials were presented on colorful PowerPoint slides on a laptop computer and included information on (a) HIV acquisition and transmission including drug-use associated risks, (b) health benefits of getting tested, (c) types of HIV testing offered in Athens County, (d) the nature of the rapid HIV test at Planned Parenthood or during the Oraquick self-test, (e) privacy and confidentiality protections associated with Planned Parenthood and Oraquick self-test, (f) the benefits of counseling and its availability at Planned Parenthood and during self-testing, and (g) counseling and health options available if one tests positive for HIV at home or the Planned Parenthood site. The PowerPoint presentation is available upon request from the first author.

Participants were encouraged to ask questions to help clarify the information on the slides. Appalachian individuals are often afraid and wary of outsiders and health professionals, and sometimes reluctant to ask questions or ask for help. To maintain an atmosphere of respect and trust, all questions were answered immediately, even if the information was going to be presented on a future slide. The interventions were delivered in approximately 15 min depending on the number of questions asked by the participant. Immediately following the educational presentation, participants completed posttest measures on HIV knowledge, HIV stigma, and attitudes toward testing. Participants were then compensated with a \$25 Walmart gift card for their participation in the first phases of the study.

HIV Testing

After receiving compensation, participants were invited to participate in the final phase of the study that would provide a free self-test HIV kit (Oraquick home test kit marketed locally for over-the-counter use at \$40) to be used in a private office at Tri-County or a coupon for a free rapid HIV test, which cost \$25, to be administered at the local Planned Parenthood. Participants who were not interested were thanked for their participation and provided literature about HIV testing. Those who were interested were provided with an informed consent sheet detailing the purpose of this phase of the study. Participants who chose not to consent were thanked and similarly provided with HIV testing literature. Individuals who consented then selected one of the types of testing. Participants who preferred the onsite test were guided to a private room where they were left alone with the test kit but able to ask the research staff member questions if needed. The research staff member recorded all questions. Following the self-test, the participants received posttest counseling including (a) the meaning of the test results; (b) HIV prevention counseling; and (c) a referral for additional testing, if the results were positive. Individuals who tested seronegative were praised for their negative test and encouraged to reduce their risk of contracting HIV by practicing safer sex and drug use behaviors. All individuals, per CDC recommendations (CDC, 2014b), were reminded that they should be tested for HIV at least once a year if engaging in unprotected heterosexual sex and more often if engaging in sex between men. If an individual tested positive for HIV, the individual was linked to local HIV services. Once the individual

received the posttest counseling, he or she was given a \$20 gas card as a thank-you for participating in this phase of the study. All participants were asked about satisfaction with the self-test and the likelihood of using it in the future.

If an individual preferred to get an HIV test at Planned Parenthood, the only location in Athens County to get an HIV test, the individual was given a special coupon for a free rapid test at Planned Parenthood. Participants who chose to go to Planned Parenthood were given a \$10 gas card at Tri-County and another \$10 gas card after they completed the test at Planned Parenthood. Planned Parenthood provided their routine posttest counseling to participants who chose to get tested at their organization.

RESULTS

This study utilized a quantitative within group pre/posttest study design. Descriptive statistics were used to describe the demographics and health behaviors of the sample. Cumulative scores were created for the HIV knowledge, HIV stigma, HIV mistrust, and health disparity scales. Paired *t* tests and analyses of covariance were calculated for continuous pre/post data, McNemar's test was used to analyze pre/post dichotomous data, and correlations were used to analyze relationships between cumulative scores and demographic variables. Short open-ended questions were asked on the survey to supplement closed-end responses and were analyzed via content analysis. All analyses were conducted using version 21.0 of the Social Statistical Package of the Social Sciences.

Demographics, Health Care, HIV Risk Behaviors, and Prior History of HIV Testing

As illustrated in [Table 1](#), almost all of the 60 participants identified as Caucasian or White and the sample was nearly equally divided among men and women. The average age of the participants was 40.32 years ($SD = 13.09$, range = 20.00–71.00). The majority of the sample identified as heterosexual, were married or partnered, had a high school diploma, and were unemployed. Most reported having housing and health insurance (Medicaid). Most of the participants had visited a health care professional in the past 12 months, and the majority ranked the last care received as good or excellent. A high proportion of the sample engaged in one or more HIV high-risk behaviors, including alcohol and illegal drug use, needle sharing, and failure to use condoms. One individual responded that they had sexual intercourse in the past with someone who was HIV positive, and three individuals were unsure if they had done so. One individual also reported having sex with an IDU in the past, and two others were unsure if they had done so. Half of the sample had completed an HIV test in their lifetime, but significantly more women ($n = 19$) reported doing so than men ($n = 11$), $\chi^2(1, N = 60) = 4.27, p = .04$. Of the 30 individuals who had been tested in the past, 16 (26.7%) reported being tested at the OBGYN or other doctor's office, and nine (15%) reported being tested outside of Athens. The majority of the sample reported they “do not worry at all” or only “somewhat worry” about getting HIV/AIDS. The majority also indicated they wanted to get tested for HIV in the next 12 months.

TABLE 1
Demographic and Health Care Information

<i>Demographic Variables</i>	<i>n (%)</i>	<i>Health Care Variables</i>	<i>n (%)</i>
Female	30 (50.0)	Tested for HIV	30 (50.0)
Caucasian	58 (96.7)	Received health care in past 12 months	56 (91.7)
< \$999 income/month	47 (78.3)	Worry about getting HIV/AIDS	
High school diploma	48 (80.0)	A lot	6 (10.0)
Employed full- or part-time	9 (15.0)	Somewhat	20 (33.3)
Served time in prison	12 (20.0)	Not at all	34 (56.7)
Housed	56 (93.3)	Health disparities	
Married/Partnered	39 (65.0)	Inability to pay	39 (65.0)
Sexual orientation		Do not take health insurance	35 (58.3)
Heterosexual/Straight	51 (85.0)	Services not offered	32 (33.3)
Homosexual/Gay/Lesbian	4 (6.7)	Discrimination	11 (18.3)
Bisexual	4 (6.7)	Difficulty speaking English	15 (25.0)
Athens County resident	59 (98.3)	HIV risk categories	
Recent substance abuse		MSM	4 (13.8)
Alcohol	36 (60.0)	WSW	2 (6.6)
Marijuana	25 (58.3)	IDU lifetime	8 (18.6)
Opiates	29 (48.3)	Sharing needles	10 (16.6)
Cocaine	19 (31.7)	No current condom use	47 (78.4)

Note. $N = 60$. MSM = men who have sex with men; WSW = women who have sex with women.

TABLE 2
Number and Percentage of Respondents Responding Yes to Items Describing
Barriers to HIV Testing

<i>Barrier to HIV Testing Variables</i>	<i>n (%)</i>
I don't know where to go for HIV testing.	15 (25.0)
I'm afraid I might get recognized at the HIV testing site.	13 (21.6)
I'm afraid of losing my partners or spouse if I test positive.	12 (20.0)
I am worried about the confidentiality of my results.	11 (18.3)
The HIV testing site is too far away.	10 (16.7)
I'm afraid of losing my job if I test positive.	9 (15.0)
There is no cure for AIDS so why get tested.	9 (15.0)
I'm afraid of losing my health insurance if I test positive.	8 (13.3)

Note. $N = 60$.

Testing Barriers

As illustrated in Table 2, there were several barriers to getting an HIV test in Athens County. The most cited reason was not knowing where to get tested followed by fear of getting recognized at the HIV testing site, fear of losing a partner or spouse if testing positive, worry about the confidentiality of the results, the testing site distance, and not wanting to know the results.

Pre- and Posteducational Assessment

HIV Knowledge

On average, participants had high levels of HIV knowledge on the pretest. They answered, on average, 14 (70%) of the 20 knowledge questions correctly ($M = 13.92$, $SD = 2.63$; range = 8.00–19.00) during pretest. The two items that were most often answered incorrectly on the pretest were related to timing of HIV testing and development of AIDS. The percentage of correct answers increased significantly on posttest to 16 (80%; $M = 16.00$, $SD = 2.46$; range = 6.00–19.00), $t(48) = -4.26$, $p < .00$. Although the percentage of correct responses for each individual item arose from pre- to posttest, only three yielded significance on the McNemar test: HIV cannot be transmitted through mosquito bites, HIV can be transmitted during oral sex, and men and women have equal chances of getting HIV from their partners. For wording of all HIV knowledge items and proportion of correct responses for pretest and posttest, refer to [Table 3](#).

HIV Mistrust

As illustrated in [Table 4](#), individuals in this sample had low levels of HIV mistrust. On the pretest, few participants felt that HIV was a manmade virus or that there was an effective cure or

TABLE 3
Number and Percentage of Participants Correctly Answering HIV Knowledge Items Pre- and Postintervention

<i>HIV Knowledge Pre- and Postintervention</i>	<i>Prelesson</i> (n, %)	<i>Postlesson</i> (n, %)
Teenagers and young adults are at high risk of being infected with HIV (T).	47 (78.3)	53 (88.3)
HIV can be transmitted through mosquito bites (F).	31 (51.7)	55 (91.7)*
HIV/AIDS can be transmitted if an uninfected person donates his/her blood (F).	30 (50.0)	35 (58.3)
A person can get HIV from oral sex (T).	32 (53.3)	54 (90.0)*
Taking an HIV test one week after having sex can tell a person if he/she has HIV (F).	32 (53.3)	41 (68.3)
A person can get HIV even if he/she has only had one unprotected sexual encounter with an HIV-infected person (T).	55 (91.7)	58 (96.7)
In general, it takes 3-6 months for a newly HIV infected person to develop AIDS (F).	12 (20.0)	12 (20.0)
HIV testing cannot be done unless you request or agree to have it done (T).	46 (76.7)	47 (78.3)
A person would know if he/she had been infected with HIV (F).	48 (80.0)	46 (76.7)
A person with HIV can look and feel healthy (T).	50 (83.3)	58 (96.7)
A pregnant woman with HIV can pass the virus to her baby (T).	56 (93.3)	56 (93.3)
It is harder for women to get HIV from men than for men to get HIV from women (F).	39 (65.0)	52 (86.7)*
HIV testing is usually anonymous and/or confidential (T).	51 (85.0)	85 (86.7)
Douching after sex can keep a woman from getting HIV (F).	50 (83.3)	53 (86.7)
Any time blood is drawn it is tested for HIV (F).	35 (58.3)	40 (66.7)
HIV makes it more difficult for your body to fight off infections (T). ^a	55 (91.7)	57 (95.0)
HIV can be cured with medicine (F). ^a	40 (66.7)	42 (70.0)
You can get HIV by sharing needles with other drug addicts (T). ^a	58 (96.7)	59 (98.3)
Using condoms can protect you from getting HIV (T). ^a	39 (65.0)	49 (81.7)

Note. $N = 60$. T = true; F = false.

^aFisher Items.

* $p < .001$. McNemar test for within subjects dichotomous data.

TABLE 4
HIV-Related Stigma, HIV Mistrust, and HIV Testing Items Pre- and Postintervention
(Number and Percentage)

<i>Items</i>	<i>Prelesson</i> (n, %)	<i>Postlesson</i> (n, %)
<i>HIV mistrust variables</i>		
HIV is a manmade virus that was created to get rid of certain groups of people.	7 (11.7)	7 (11.7)
An effective HIV vaccine already exists but has been withheld from the public.	4 (6.7)	8 (13.3)
The health department is doing all it can to stop the spread of AIDS.	51 (85.0)	55 (91.7)
There is a cure for AIDS but the government is keeping it from the public.	6 (10.0)	3 (5.0)
<i>HIV stigma variables</i>		
I feel angry toward individuals living with HIV/AIDS.	5 (8.3)	3 (5.0)
I feel afraid of individuals living with HIV/AIDS.	14 (23.3)	9 (15.0)
I feel disgusted by individuals living with HIV/AIDS.	2 (3.3)	3 (5.0)
People with HIV/AIDS should be legally separated from others to protect the public health.	3 (5.0)	5 (8.3)
The names of people with HIV/AIDS should be made public so that others can avoid them.	7 (11.7)	8 (13.3)
People who got HIV/AIDS through sex or drug use have gotten what they deserve.	3 (5.0)	5 (8.3)
I would be uncomfortable if my child attended school where one of the students was known to be living with HIV/AIDS.	12 (20.0)	8 (13.3)
I would be uncomfortable working in an office where one of my coworkers was known to be living with HIV/AIDS.	7 (11.7)	4 (6.7)
I would be uncomfortable shopping at a local grocery store if the owner was known to be living with HIV/AIDS.	7 (11.7)	6 (10.0)
<i>HIV testing variables</i>		
Heard of over-the-counter oral HIV self-test.	10 (16.7)	38 (63.4)
Purchased an over-the-counter oral HIV self-test.	1 (1.7)	NA
Likely to get tested for HIV if an oral self-test was made available.	38 (63.3)	45 (75.0)
Likely to get tested for HIV at Planned Parenthood if made available.	24 (40.0)	39 (65.0)
Important to have a live person giving you results face-to-face.	14 (23.3)	42 (70.0)
Comfortable interpreting results after a self-test.	33 (56.9)	40 (66.7)
Comfortable calling 1-800 number for results assistance.	48 (80.0)	56 (93.3)

Note. $N = 60$.

* $p < .05$. McNemar test for within subjects dichotomous data.

vaccine being withheld from the public, and 85% felt that the health department is doing all it can from stopping the spread of AIDS. On the posttest, there were a few changes in the proportion of individuals who endorsed mistrust items, but none were statistically significant using McNemar's test.

HIV Stigma Index Summary

The current sample had low levels of preintervention HIV-related stigma scale scores ($M = 18.87$, $SD = 5.42$, range = 9–28). After the educational intervention, the overall stigma scale mean scores significantly decreased from the pretest ($M = 18.00$, $SD = 4.78$, range = 9–25), $t(54) = 2.04$, $p = .04$. There was a significant interaction between gender and preeducational and posteducational HIV stigma scores, $F(1, 51) = 4.24$, $p = .04$. The pretest HIV stigma means for men ($M = 18.63$, $SD = 5.96$, range = 13–37) and for women ($M = 19.00$, $SD = 4.95$, range =

12–29) both decreased postintervention ($M = 17.86$, $SD = 5.67$, range = 12–36; $M = 18.73$, $SD = 5.07$, range = 12–27); however, there was a significant decrease for men compared to women.

As detailed in Table 4 at pretest, nearly one fourth of the sample reported being afraid of individuals living with HIV, 20% reported they would be uncomfortable if their child attended school where one of the students was known to be living with HIV/AIDS, and 12% would be uncomfortable if they worked with an individuals living with HIV/AIDS or attended a grocery store if the owner was to be living with HIV/AIDS. After the educational intervention, although the proportion of individuals endorsing stigma related items decreased on five of the nine items, none of them were statistically significant decreases. Of interest, the proportion of participants endorsing three items actually increased from pretest to posttest, although not significantly. Notably, two of these items reflected increased endorsement of coercive policies, for example, making names of people living with HIV publicly available and the belief that individuals with HIV/AIDS should be legally separated both had more people endorse the item after the intervention.

Preferences for HIV Testing

As detailed in Table 4, on the pretest, half of the sample knew that the Planned Parenthood of Athens County offered HIV testing by a blood finger prick, but very few were aware of the new over the counter oral self HIV test. Only one person had actually purchased and used the new self-test prior to this study. The majority of participants agreed they would be likely to take an oral self-test if it was made available to them, whereas less than half the sample was likely to go to Planned Parenthood to get an HIV test. Only a few participants felt that it was important to have a face-to-face meeting with a professional to obtain HIV test results, whereas a large majority of the sample reported they would feel comfortable calling a 1-800 number and talking about results via phone.

After the educational intervention, there was an increase in the proportion of individuals who would be likely to get an HIV test via self-test kit or at Planned Parenthood, if made available. Furthermore, more participants reported on the posttest that it was important to have a live person give HIV test results, that they were comfortable with interpreting self-test results, and that they were likely to call a 1-800 number for assistance or support.

Associations Among Demographic, HIV Knowledge, HIV Mistrust, HIV Stigma, and HIV Testing Variables

There was an association among education level and HIV knowledge and an association between the HIV mistrust and stigma scales. There was a significant positive relationship between HIV stigma and HIV mistrust on the pretest, $r(57) = .35$, $p = .01$, and there was a significant positive relationship between educational attainment and HIV knowledge on the pretest, $r(51) = .37$, $p = .01$.

Postintervention HIV Testing Decision

Fifty-eight of the 60 participants opted to get an HIV test after the educational intervention and posttesting. Of these 58 individuals, 57 opted to take the onsite rapid self-test kit and one person

opted for the coupon to go to Planned Parenthood. The individual who opted to go to Planned Parenthood did not follow through. All of the 57 participants who took the HIV self-test kit were “very satisfied” with the test, and 97% ($n = 55$) reported they were “very confident” they can get tested for HIV in Athens in the future. Forty (70%) said they were likely to buy and use the self-test kit in the future, and another six (10%) said they would “maybe” buy and use it again if they felt they needed to. During debriefing most participants indicated they enjoyed receiving the brief educational intervention in a one-on-one setting and they felt at ease talking to the research staff member who delivered the intervention.

DISCUSSION

The NIDA STTR model of care involves research documenting effective interventions that engage hard to reach drug-abusing groups in HIV testing and initiating and retaining those who test positive in treatment. However, implementing this model of care is challenging in rural Appalachia because residents often live in remote areas and have limited access to health care resources (ARC, 2012; Wewers et al., 2006). This study was conducted to explore service barriers related to obtaining HIV testing services in rural Appalachia and the effects of a brief educational intervention to increase informed consent readiness to participate in a study providing opportunities to use and receive counseling for an on-site HIV home-testing kit. Our study revealed some contradictory elements of this population’s knowledge about, attitudes toward, and behaviors in obtaining HIV testing.

HIV Knowledge, Risk Perceptions, and Prior Testing

Participants in this study were surprisingly knowledgeable about HIV, with an average of 70% correct responses to the pretest knowledge questionnaire. This percentage is similar to a study conducted in a neighboring county in which individuals answered 65% of the questions correctly (Basta & Vance, 2010), but slightly lower than college students, who attended a large university in rural Georgia, who used the same scale (78%; Hou, 2004) and rural probationers in Appalachian Kentucky using a different knowledge scale (84%; Oser et al., 2006). Misconceptions that were rectified following the brief educational intervention included the belief that HIV could be transmitted by mosquitos, that men and women were not equally susceptible to the virus, and that HIV could not be transmitted through oral sex. Not surprisingly there was a positive association between educational level and pretest HIV knowledge. However, it is interesting that only 80% of the current sample had obtained a high school diploma. This finding suggests that for undereducated rural samples, knowledge about HIV acquisition and transmission may not be a significant barrier to seeking HIV testing.

Lack of concern regarding one’s susceptibility to HIV is another potential barrier to testing. Less than half of the sample reported being “somewhat” or “a lot” worried about getting HIV even though the majority of the sample was engaging in at least one HIV high-risk behavior (drug use, injection drug use, unprotected sexual behavior). This is consistent with other studies that have reported that risk perception among individuals at risk for HIV is lower than actual risk (Landovitz et al., 2013; Peragallo, Gonzalez-Guarda, McCabe, & Cianelli, 2012). Despite the low perception of risk, half of the current sample reported getting an HIV test in their lifetime,

a percentage only slightly lower than a prior study of Appalachian Kentucky probationers (Oser et al., 2006) yet higher than the general American population ($< 50\%$; CDC, 2013). Significantly more women reported getting tested for HIV during their lifetime than men, a finding consistent with previous research indicating that women, especially those of reproductive age in the United States, seek out preventative health care more often than men (Bertakis, Azari, Helms, Callahan, & Robbins, 2000; Guttmacher Institute, 2013).

Similarly, despite low levels of HIV risk concerns, 80% of our sample reported an intention to get an HIV test in the future. Although this percentage seems high, it parallels the findings of another high-risk group, urban men who have sex with men, when over-the-counter testing was offered (MacKellar et al., 2011). One explanation for the high percentage of participants who had been tested, and who intended to be tested in the future, is that our sample was recruited from individuals in a medical setting for treatment for mental health and/or drug issues in which provision of information and accessibility to HIV testing is standard practice. In addition, for the 50% who had already been tested, it may be that the previous experience was enough to positively influence intention to get tested. Finally, it is possible that responding to a recruitment poster for this study that asked “if you were HIV negative or unaware of HIV status” might have attracted individuals who were interested in knowing their HIV status and more likely to want to get tested than individuals who did not sign up to participate.

Barriers to Testing

Consistent with previous studies on rural individuals (Kaiser Family Foundation, 2009) the most cited barrier to obtaining HIV testing was not knowing where to get tested. This is a major concern in Athens County where there are so few HIV testing options. As with prior research in rural areas (Sutton et al., 2010; Wright, Stewart, Curran, & Booth, 2013), other cited barriers were fear of getting recognized at the HIV testing site, fear of losing a partner or spouse if testing positive, concern about the confidentiality of the results, the testing site distance, and not wanting to know if one was HIV positive. The top two most cited barriers in this study—not knowing where to get tested and afraid of getting recognized at a testing site—could be greatly reduced by HIV self-test kits if the location and cost of the kit are not prohibitive.

HIV mistrust and stigma have been shown to negatively impact HIV prevention behaviors (condom use and testing) among urban ethnic minorities (Kalichman, 2009; Wright et al., 2013). Mistrust of the medical establishment in general and HIV treatment specifically was not a barrier to HIV testing. On the pretest this sample reported low levels of HIV mistrust. Unlike a recent study involving urban undereducated and underhoused ethnically diverse men and women who used injection drugs (Fisher, 2010), few of the rural Appalachians in this study believed that an HIV vaccine and a cure for AIDS were being withheld from the public. Results from a recent study that explored trust and distrust among health care providers in Appalachian Ohio, regarding cervical cancer, indicated that patient-centered communication and encouragement from a health care provider led women to trust their providers, whereas lack of communication, perception of poor quality of care, and male providers led to distrust (McAlearny et al., 2012). One reason for this difference is that in contrast to the disadvantaged urban population in Fisher’s study, participants in our sample reported low levels of prior discrimination by health professionals.

Surprisingly, HIV stigma also did not emerge as a barrier to testing. On the pretest, participants expressed lower levels of HIV-related stigma compared to a similar study done in a neighboring county (Basta & Vance, 2010) and the last nationally representative sample (Herek et al., 2002), although nearly one fourth endorsed an item indicating they were afraid of individuals living with HIV. It was encouraging that HIV-related stigma items were lower in this sample than other samples. This may be due to the low incidence of HIV in the general population such that community stigmatization of individuals with HIV had not been observed. This finding contradicts previous literature that has documented widespread HIV-related stigma in rural areas (Heckman et al., 1998; Wright et al., 2013; Yannessa, Reece, & Basta, 2008). So was it encouraging not only that this sample reported relatively low levels of stigma on the pretest, but also that, after the brief educational intervention, one third of the stigma items still significantly decreased from pre- to posttest.

Consent to Onsite and Future HIV Testing

All but two of the participants opted to participate in a HIV home test provided at the research site. These results are similar to a recent randomized controlled study among probationers, which reported that participants were significantly more likely to be tested onsite at a probation or parole office than at an HIV testing clinic (Gordon, Kinlock, McKenzie, Rich, & Wilson, 2013). This finding highlights the importance of making the testing readily available immediately following educational intervention and in locations where individuals are already going, including primary care, substance abuse treatment, or other services. Furthermore, research suggests that oral point-of-care testing for sexually transmitted infections and HIV have the potential to greatly increase screening, improve treatment and management, and create opportunities for new models of community-based testing services (Tucker, Bien, & Peeling, 2013). By offering the self-testing onsite immediately after the educational intervention, participants were able to not report intention but were able to actually perform the intended behavior.

After participants completed the home testing and had received counseling regarding the interpretation of their results, they reported they were “very satisfied” with the rapid test, and more than 70% reported that they would likely buy and use the self-test in the future. The product has very detailed instructions and pictures, and almost all the participants, even those with literacy issues, were able to follow the directions and complete the test accurately without assistance from the graduate assistant. As a result of using the self-test, almost all of the participants reported that they were “very confident” they could get tested for HIV in Athens County in the future. This is an encouraging result, because nearly one fourth of the sample on the pretest did not know where to get tested for HIV. The only barrier that was cited by individuals was the cost of the home-testing kit, which is \$39.99 retail at some of the drug stores in the area.

Although not specifically assessed, the implementation of this study has implications for the importance of a respectful research environment for preparing and encouraging participants to consent for HIV testing. After the completion of the study, participants mentioned repeatedly that they felt “at ease” with the third author during the entire session and that she was very “caring” and “respectful.” The third author, who was born and raised in Appalachia, knew the importance of Appalachian culture and making the participants feel at ease. Therefore, she developed a protocol that embraced the notion of “respect for persons.” She was very concerned with making

sure the research participants were made to feel comfortable through the entire session, and they were treated as her equal. Many Appalachians are intimidated by health care providers, and so the third author, who is trained as a nurse, introduced herself by her first name only. Furthermore, she met each participant in the waiting room and shook their hand and said, "I am very happy that you are here to talk with me today." She also told them at the beginning of the session that they could ask any questions at any time throughout the session. These simple steps helped produce a respectful study environment, which likely positively influenced participants decision to participate in the HIV testing portion of the study as it has among other disadvantaged groups, including female sex workers in India (Reed, Khoshnood, Blankenship, & Fisher, 2014) and the Philippines (Urada & Simmons, 2014).

Limitations and Future Research

One limitation of the generalizability of this study to other high-risk groups in rural Appalachia is that the sample was drawn from patients who had or were receiving services for mental health and substance abuse problems. As indicated by their responses, they had not previously experienced discrimination by health workers. The fact that they were health seeking and that their health care experiences had been positive may be responsible for the lower levels of mistrust as well as the relatively high level of prior HIV testing. In addition, as in many studies, recruitment is subject to selection bias. Those who agreed to participate in this study were aware that the study offered an opportunity for HIV testing. Thus future studies should assess HIV knowledge, testing attitudes, mistrust and stigma, and prior health care and HIV testing experiences for those recruited for research that does not offer onsite HIV testing.

Another factor that was not directly assessed was related to the stigma of actually buying a testing kit at one of the local stores. As previously reported, many rural individuals do not want to get tested for HIV because of tight social networks, and the same is true for individuals who work at the local drug stores. Future studies should assess comfort related to actually buying the product as well as test an intervention that would place test kits at nonstigmatizing locations for free or a reduced rate, such as food pantries, laundromats, Departments of Motor Vehicles, federally qualified health centers, substance abuse treatment centers, or other locations identified as nonstigmatizing and welcoming by the participants.

CONCLUSION

This study is one of the first studies completed to explore service barriers related to obtaining HIV testing services and the effects of a brief HIV educational intervention among economically disadvantaged individuals receiving outpatient drug treatment in rural Appalachia. It is apparent that individuals were engaging in relatively high-risk HIV behaviors yet had relatively high levels of HIV-related knowledge and low-levels of HIV-related stigma. However, after a short educational intervention, individuals were able to increase their level of HIV knowledge, decrease HIV-related stigma, reduce barriers to getting tested, and facilitate testing among almost the entire sample. To that end, for the NIDA STTR model of care to be effective in HIV testing and initiating and retaining those who test positive in treatment in rural Appalachia, it is important

that the education and testing is made available at places where rural individuals feel comfortable attending, in a format that is well received by the participants, and is immediately followed by the option of getting a rapid self-test.

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