Condom Use Knowledge and Condom Use among African-American Women: Evidence from a Cross-Sectional Study in Harris County, Texas

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ABSTRACT

The aim of this study was to determine the association between self-reported condom use knowledge and condom use at last intercourse among African-American women (≥ 18 years of age) in Harris County, Texas. The Condom Use Assessment Questionnaire was administered to 297 African-American women in Harris County, Texas, from August-November 2007. Chi-square and T-test statistics were conducted to assess the difference between condom users and non condom users. It was determined that there was no significant difference between condom use knowledge and condom use (p=0.27). Based on the findings of this study, it is important to further understand other risk factors (i.e. substance abuse, lack of awareness of HIV serostatus, sexually transmitted diseases, socioeconomic issues and homophobia and concealment of homosexual behavior) that influence condom use in the African-American community in order to design effective interventions to promote safer sex, and thereby, reduce the rate of HIV in this group.

Introduction

Human Immunodeficiency Virus (HIV) infection continues to disproportionately affect African-American communities. An estimated 1.7 million people in the United States have been diagnosed with HIV, with approximately 40,000 new infections occurring each year (CDC, 2007). While African-Americans represented only 13% of the population in the United States in 2005, they represented 54% of the United States HIV cases (CDC, 2008). In 2005, 23,472 adults lived with HIV in Texas (Texas Department of State Health Services (TDHS, 2007). In Texas, African-Americans shared a greater burden of HIV than members of any other racial/ethnic groups. While African-Americans comprised only 11.7% of the population in Texas in 2008, they represented 41% of Texas HIV cases. African-American females accounted for 60% of HIV cases in Texas (TDHS, 2007).

In 2008, Harris County, one of the largest counties in Texas, had a population of approximately 3,984, 349 with Houston as its urban center (U.S. Census Bureau, 2007).

Between January 1999 and September 2006, there were approximately 13,382 persons living with HIV in Harris County (Houston Department of Health and Human Services [HDHHS], 2008). The majority of these HIV cases were among African-Americans (54%), followed by Caucasians (25%), Hispanics (20%) and others (1%). Among the female cases, the majority were African-Americans (74% of the female HIV cases in Harris County) in the 20-29 age groups (36%). The primary mode of transmission among African-American females was unprotected heterosexual contact (HDHHS, 2008).

Several studies have examined whether condom use knowledge and condom use is an important predictor of condom use. For example, Lazarus, Himedan, Ostergaard & Liljiatand (2006) explored knowledge with regards to HIV/AIDS and condom use among 192 Somali and Sudanese men and women immigrants in Denmark, aged 18-49, who lived in Denmark for one or more years. The participants completed a 78-item questionnaire. It was reported that less than 50% of both men and women scored more than 70% on the knowledge portion of the questionnaire. It was concluded that in the two Danish immigrant groups, condom use knowledge level and condom use were low. Women with poor educational level were reported to have low knowledge of condom use and low use of condoms compared to those women with a higher educational level (Lazarus, Himedan, Ostergaard & Liljiatand, 2006). Another study conducted by Holmes, Ogungbade, Ward, Ross, Ekong & Essien (2008) that focused on baseline data from the Situationally Focused Individual HIV/AIDS intervention to promote HIV protective behavior among 2,213 Nigerian Military Personnel were analyzed. Using composite score of the six steps for the knowledge of condom use and modeling as the outcome variable, they examined educational status as a predictor variable, modeling with unconditional univariable and multivariable logistic regression. This study reported low knowledge of condom use and modeling among the Nigerian military personnel; as well as a direct correlation between education attainment and knowledge of condom use and modeling (Holmes, Ogungbade, Ward, Ross, Ekong & Essien, 2008).

In this study, results are presented from a self-administered questionnaire that targets a large sample of African-American women and assesses self-reported condom

use. Our objective in this study was to determine if there was an association between condom use knowledge and self-reported condom use based on age, educational level, marital status and religious affiliation among African-American women (≥ 18 years of age) in Harris County, Texas. Promoting condom use has been a major goal of programs designed to prevent HIV infection (CDC, 2008). Recent studies have provided a great deal of information regarding condom use, but nearly all of these studies have been limited. They were restricted to a narrow age range or they had relatively small samples.

Methods

Participants

A convenience sample of 342 eligible women were asked to participate in the study; 45 eligible women declined to participant in the study due to time constraints. Two hundred and ninety-seven African-American women (≥ 18 years of age) in Harris County, Texas participated in the study. Participants were recruited from a community center and a local health fair in Harris County, Texas from August-November 2007. These sites were selected based on the availability of the population; the time frame in which the study was conducted; and the large numbers of African-American women participating and or involved in the public congregations (churches, civic clubs, social clubs, community centers, health fairs and job fairs) in Harris County, Texas.

Eligibility was based on whether the women were: 1) African-American; 2) 18 years of age or older; 3) residents of Harris County; and 4) able to understand and complete the questionnaire in English.

Recruitment Procedures

All procedures and the questionnaire were reviewed and approved by the Committee for the Protection of Human Subjects (CPHS), the Institutional Review Board (IRB) for the University of Texas Health Science Center at Houston (UTHSC-H). Recruitment commenced in August 2007 and concluded in November 2007. Letters summarizing the purpose of the study were mailed to the directors of the James Prince Community Center and Sharpstown Health Fair for dissemination to members and guests. The letters sought permission for the study to be conducted at those locations. Once permission was granted, the directors of the community center and health fair scheduled appointments for the researchers to be introduced to the target population. The directors of the community center and health fair described the study to the target population and introduced the researchers. The researchers explained the purpose, the risks and benefits of the study. Participants were advised that they could refuse to answer any questions and participation would be both voluntary and anonymous. All participants signed a consent form and were given the questionnaire. The participants were instructed to deposit the completed questionnaire in a sealed box located by the exit doors of the

community center and the health fair. Completion of the questionnaire took approximately thirty-five minutes.

Measurements

Condom Use. Condom use was measured with one variable, condom use at last intercourse with any sexual partner (Norris Phillips, Statton, Pearson, 2005; Williams, Bowen, Timpson, McCoy, Perkins et al, 2001). The question was as follow: "Was a condom used the last time you had sexual intercourse?" (Yes/No). This measure was chosen because it requires relatively one question and is easier to answer accurately as compared to other measures that include questions that require respondents to estimate their frequency of condom use during some specified time interval (Prata, Morris, Mazive, Vahidnia & Stehr, 2006). Another study conducted by Meekers & Rossem (2005) also used a similar condom use question.

Condom Use Knowledge. Knowledge of how to use condoms with the Condom Use Knowledge Scale was measured with 17 items with a Cronbach $\alpha = 0.73$ (Lindberg, 1993). The original Condom Use Knowledge Scale consisted of 19 multiple-choice items with internal consistency (Cronbach $\alpha = 0.66$). In this study, we revised the scale by removing two questions based on feedback from the focus group and two behavioral HIV experts. Each question had four possible answers. The correct answer was worth one point and an incorrect answer received no points. Test scores could range from zero (lowest) to 17 (highest). The number of correct answers was summed (range: 0–17), with 17 being the maximum (highest) knowledge of condom use score.

Demographics. We used seven variables to categorize participants' age, gender, racial/ethnic background, educational level, marital status, location and religious affiliation.

Analysis

Frequency analyses were conducted on the outcome variable (condom use) and on all categorical demographic variables. Means, standard deviations, and ranges for all continuous demographic variables and condom-use knowledge scores were calculated. Two-sample t-test and chi square statistics were used to assess the difference in the mean scores in condom use knowledge among participants who used condoms and participants who do not use condoms. All tests were considered to be statistically significant if $p<0.05$. All analyses were performed by STATA statistical software package (version 9).

Results

Descriptive Analyses

Table 1 provides an overview of the demographic characteristics of the participants in this study. The participants in the study were diverse in age, educational level, religious affiliation and marital status. Majority of the participants in the study were between the ages of 18-29 years and had a post-high school education. Also, the majority of the participants self-reported as being single (65%) and declared themselves to be affiliated with the Protestant (Baptist) faith (55%).

Table 1
Demographic Characteristics of Participants

Variables	N=297
Educational Level	
Did not complete high school	55(19%)
Completed high school/G.E.D.	63(21%)
Attended college but not completed / completed associate college degree	115(39%)
Completed college / attended or completed graduate school	64(21%)
Age Group	
18-29	130(44%)
30-39	63(22%)
40+	104(34%)
Marital status	
Single	194(65%)
Married	71(24%)
Divorced/Widowed	31(11%)
Religious affiliation	
Baptist	163(55%)
Methodist	20(7%)
Catholic	63(21%)
Other	43(14%)
None	8(3%)

Abbreviation:
%= percentage

Table 2 depicts the demographics of self-reported condom use at last intercourse. Forty-three percent (43%) of women reported condom use at last intercourse. Participants who self-reported condom use during their last sexual intercourse were more likely to be single, have a Baptist affiliation, and have had some college-level education. All demographic characteristics were statistically associated with condom use knowledge ($p<0.001$).

Table 2
Demographics of Self-Reported Condom Use Across Condom Use Knowledge Score (N=276)

	Condom use TP n=119 (43%)	Non-condom use TP n=157(57%)	P-value
Educational level			
< high school	33(28%)	16(10%)	<.0001
Completed H.S./G.E.D.	24 (20%)	35(22%)	
Some college / completed associate college degree	38(32%)	71(45%)	
Completed college or higher	24(20%)	35(22%)	
Age Group			
18-29	69(58%)	53(34%)	<.0001
30-39	18(15%)	41(26%)	
40+	32(27%)	63(40%)	
Marital status			
Single	87(73%)	91(58%)	<.0001
Married	15(13%)	56(36%)	
Divorced/Widowed	16(13%)	10(6%)	
Religious affiliation			
Baptist	69(58%)	84(54%)	<.0001
Methodist	3(3%)	17(11%)	
Catholic	20(17%)	41(26%)	
Other	24(20%)	11(7%)	
None	3(3%)	4(3%)	

Abbreviations:
TP= Total Population
%=Percentage
H.S= high school

Condom Use Knowledge and Condom Use. From the results of the two-sample t-test, the mean Condom Use Knowledge score for participants who used condoms was 10.5 (SD=2.97) and participants who did not use condoms were 10.1 (SD=3.84), there was no significant differences in condom use knowledge between participants who used condoms and participants who did not use condoms (p=0.27).

The majority of the women in the sample knew that K-Y jelly or other water-soluble lubricant was safe to use to lubricate a condom. In addition, non-condom users answered more questions correct as compared to condom users. Regardless of condom use, few women demonstrated an understanding of methods and techniques used to enhance sexual pleasure for their partner while using a condom or the proper actions to take if the condom breaks during sexual intercourse.

Chi-square statistic was performed on each item of the Condom Use Knowledge Scale to distinguish condom users and non-condom users. It was determined that nearly half of the items (items # 1, 3, 4, 8, 10, 14, 15 and 17) were able to distinguish condom users and non-condom users when assessed independently. A detailed overview is provided in Table 3.

Table 3
Percentage of Participants Correct Responses - Condom Use Knowledge (N=275)

	Condom Use n=118	Non-condom use n=157	
Questions	Count	Count	X^2 P
1 .When is the correct time to put a condom on your partner?	94 (47%)	108 (53%)	4.08 **p=0.04**
2. What is the correct way to apply a condom?	76 (41%)	111 (59%)	1.22 p= 0.27
3. What is safe to use to lubricate (wet) a condom?	102 (46%)	119 (54%)	4.84 **p= 0.03**
4. Which should you do to decrease the chance of a condom breaking?	92 (47%)	104 (53%)	4.52 **p= 0.03**
5. What is the best type of condom to use for protection from HIV/AIDS and other Sexually Transmitted Diseases/Venereal Diseases (STDS/VDS)?	84(42%)	117 (58%)	0.61 p= 0.44
6. Which of the following is important to do when putting on a condom?	72(47%)	82 (53%)	1.86 p=0.17
7. When using condoms, what is important to do after giving a man oral sex but before having vaginal sex?	77(40%)	114 (60%)	2.42 p= 0.12
8. What is important to do if a man loses his erection (get soft) during intercourse?	87(48%)	94 (52%)	5.32 **p= 0.02**
9. What will enhance sexual pleasure for the man while using a condom?	34(49%)	36 (51%)	1.12 p= 0.29
10. What should you do to make sure the condom is protecting you before the man ejaculates (comes/cum)?	76 (48%)	81 (52%)	4.54 **p=0.03**
11. What is important to do after the man comes/cum (ejaculates)?	74 (42%)	101 (58%)	0.16 p=0.69

12. When are condoms most likely to come off the penis during sex?	55 (39%)	87 (61%)	3.34 p=0.19
13. What is <u>not</u> true about buying, using and storing condoms?	75 (42%)	102 (58%)	0.13 0.72
14. What is a reason for using a lubricant with a condom?	92 (48%)	100 (52%)	6.04 **p=0.01**
15. To protect you against HIV/AIDS, what is the best thing to do if the condom breaks?	28 (34%)	55 (66%)	4.34 **p=0.04**
16. How do you dispose of condoms?	45 (40%)	68 (60%)	0.16 p=0.69
17. What should you do if you attempt to put a condom on backwards or inside out?	96 (48%)	103 (52%)	7.84 **p= 0.05**

Discussion

The aim of this study was to evaluate the association between condom use knowledge and condom use behavior. Our study contrasts with the studies of several researchers (Holmes, Ogungbade, Ward, Ross, Ekong & Essien, 2008; Lazarus, Himedan, Ostergaard & Liljiatand, 2006; Weller & Davis, 2002), who reported a significant association, but corroborates with other studies of researchers (Rock, Resnickl & McNeely, 2005; Zellner, 2003), who have reported no significant association between condom use knowledge and condom use.

Level of condom use in this study was consistent with previous studies with African-Americans, which reflected low rates of condom use (Holmes, Ogungbade, Ward, Ross, Ekong & Essien, 2008; Prata, Morris, Mazine, Valideria, & Stehr, 2006). Specifically, this study documented 43% of the women who reported condom use at last intercourse. The researchers in this study reported lower use of condoms among divorced /widowed and married women. Given the disproportionate cases of HIV among African-American women in Houston, Harris County, it is important to promote consistent and correct condom use for both steady and casual sexual partners. However, asking your sexual partner(s) to use a condom during sexual intercourse may signal mistrust to the partner (Prata, Morris, Mazine, Valideria, & Stehr, 2006). Addressing this issue requires condom use knowledge education, counseling, and skill-based interventions to encourage condom use for those engaging in risky sexual behaviors.

In addition, this study has used an array of questions to measure knowledge of condoms, from participants general knowledge about condoms to their general understanding of condoms use (e.g., when is the correct time to put a condom on your partner, what is the correct way to apply a condom, what is safe to use to lubricate (wet) a condom, what is important to do if a man loses his erection (get soft) during intercourse) Our study, which modified Lindberg's (1993) condom use knowledge survey is generalizable to African-American women in Houston, Harris County aged 18 and older. This study contributes to the literature on condom use and prevention of HIV by examining the participants' condom use knowledge level and their condom use.

The Condom Use Knowledge Scale was not able to distinguish condom users and non-condom users, however when each item on The Condom Knowledge Scale was assessed individually, nearly half of the items (8) were able to distinguish condom users and non-condom users. It is possible that a scale could be created with the 8 items that distinguished condom users and non-condom users. Developing the 8 items on the Condom Use Knowledge Scale enables researchers to increase condom use by teaching specifically about the 8 items with distinguished condom users and non-condom users.

Research demonstrates that by merely telling people to use condoms to prevent the spread of HIV is not enough to change their behavior (CDC, 2007). Condom use is a dyadic behavior: it involves two people and an agreement to use a condom. Thus, looking at just one of the two partners and their characteristics is only half of the condom use equation. Since the condom is worn by the male, it is likely that it is characteristic of the male, rather than the female, are crucial ones to study in regard to condom use

There were a few limitations to the study. First, a temporal sequence of cause and effect relationship between the independent and outcome variables could not be established due to the use of a cross-sectional study design. The study collected data from two geographic locations, which may limit the ability to generalize the study results. However, this study selected sites that increased the likelihood of potential participants being representative of various locations within Houston, Harris County, Texas by selecting a community center and a health fair on days where outreach activities involved inputs from all communities. In addition, we obtained the data for this study based on participants self-reported condom use and condom use knowledge. Second, the use of a non-probability (convenience) sample might have introduced the potential for selection bias, limiting our ability to generalize to other settings, times and populations. A third limitation was that the data for this study was obtained through a self-reported questionnaire, which could lead to potential information bias. However, it was established that self-reported condom use was the only way to determine condom use (Geary, 2003). Fourth, having participants recall their last sexual intercourse and condom use could lead to recall bias. However, assessing condom use at last intercourse requires relatively few questions that are easier to answer accurately compared to other measures that requires respondents to estimate their frequency of condom use during a specified interval (Anderson, Rietmeijer & Wilson, 1998). Finally, another form of information bias that could occur was prevarication (lying) bias, which occurs when participants have ulterior motives for answering a question. If the collected information did not reflect the participants' true behavior, the study results would be inaccurate and invalid. To prevent this type of bias, the questionnaire was self-administered and the researchers assured participants that their responses would remain confidential.

Concluding Remarks

It is especially important to understand the factors that influence condom use in the African-American community in order to design effective interventions to promote safer sex and, as a result, reduce the rate of HIV within this group. Our findings suggested that the participants' condom use could depend on the participants'

demographic characteristics. Several studies (Lazarus, Himedan, Ostergaard & Liljiatand, 2006; Prata, Morris, Mazine, Valideria, Stehr, 2006) have reported similar results indicating that condom use could be related to participants' educational level. Although we have assessed demographic characteristics in this study, we did not examine other factors, including substance abuse, lack of awareness of HIV serostatus, sexually transmitted diseases, socioeconomic issues and homophobia and concealment of homosexual behavior. These factors have been identified by CDC (2008) as risk behaviors but previous studies have focused separately on these factors among African-Americans and their condom use. There has not been a comprehensive study addressing risk behaviors in the African-American community. Continued measurements of condom use behaviors are needed in the African-American communities to increase condom use in this community. Secondly, more research is needed to educate both men and women regarding the risks and consequences of contracting HIV and other STDs with non condom use. Finally, greater efforts must be made to target programs toward African-Americans, both males and females.

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