CHANGES IN HIV/AIDS KNOWLEDGE AMONG EARLY ADOLESCENTS IN PUERTO RICO

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Introduction: One of the factors that influences HIV risk behavior among early adolescents is their HIV/AIDS knowledge. The objectives of this study were 1) to describe the sociodemographic features and HIV/AIDS knowledge among Puerto Rican early adolescents participating in the ASUMA (A Supportive Model for HIV Risk Reduction in Early Adolescents) project; and 2) to assess changes in the knowledge of HIV/AIDS within the intervention and nonintervention groups after the first year of the study.

Methods: This is a prospective cohort study of 173 early adolescents after 12 months of participation in the ASUMA project. The setting of the study was four junior high schools. Baseline and follow-up self-administered questionnaires were issued to the entire study group. The first workshop was developed directed to increase HIV/AIDS knowledge and decrease vulnerability in the group assigned to the intervention. Descriptive and inferential analyses were performed.

Results: 47% of adolescents were cases and 52.6% controls. Most adolescents were 12 years old; 50.3% were boys and 49.7% were girls; 78.6% believe that they could have a good conversation with their parents; and 26.3% reported alcohol use at any time in their lives. A significant increase in HIV/AIDS knowledge was found among adolescents from the intervention group ($P<.001$), while a nonsignificant increase was found among control adolescents.

Conclusions: An increase in HIV/AIDS knowledge was observed among adolescents who participated in the first year of the ASUMA project. This study illustrates the importance of the creation of culturally appropriate instruments and interventions to reduce HIV infection in adolescents. (*Ethn Dis*. 2008;18[Suppl 2]:S2-146–S2-150)

Key Words: HIV/AIDS Knowledge, Adolescents, Puerto Ricans

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INTRODUCTION

In spite of the preventive efforts to reduce the incidence of HIV infection in the last decade, 10 million young people age 13–24 years are infected with HIV worldwide.[1] In United States, the Centers for Disease Control and Prevention reported an increase in the estimated number of new HIV infections among persons aged 15–19 years; 2790 new cases in 2001 increased to 4113 new cases in 2005.[2] As of December 2006, 16% of all reported AIDS cases in Puerto Rico have been diagnosed in patients aged 20–29 years.[3] Considering that the typical incubation period between HIV infection and development of AIDS is 10 years; many of these young adults must have been infected during adolescence. A descriptive study of patients infected with HIV in the adolescence in Bayamón, Puerto Rico, revealed many of these patients had not completed high school and were frequent substance abusers, particularly of tobacco, cocaine, and heroin.[4] The 2000 census data from Puerto Rico found that 8% of the Puerto Rican population were adolescents between the ages of 10 to 14 and of those, 48.1% were girls.[5] In a survey of Puerto Rican young people, a high proportion of Puerto Rican adolescents were sexually active (28%).[6]

Teenagers are susceptible to many health problems, such as drug use and sexually transmitted diseases.[7] Adolescents are a high-risk group because 1) they are in an age of sexual identity exploration, and they experiment with illicit drugs; 2) they are impulsive, and they are influenced by their peer group; and 3) they don't feel vulnerable because they cannot foresee long-term consequences.[8] Adolescents' attitudes toward risk behaviors are often the denial of any chance of infection and the adoption of the belief that they are invulnerable.[9] Fear of contracting AIDS decreases substantially as knowledge of the disease increases.

Alcohol and drug use could be considered risky behavior since they reduce inhibitions.[10,11] Alcohol and drug use are the most important predictors of sexually transmitted disease and HIV infection among high school students; they also have a strong effect on the age of sexual debut.[11] Sexually active students in Puerto Rico have more exposure to drug use and alcohol than sexually inactive students.[6] In 2004, 22.6% of high school students reported that they used alcohol for the first time when they were ≤11 years of age.[12]

A lack of HIV/AIDS knowledge and incorrect HIV/AIDS information are associated with HIV infection.[13] Among Puerto Rican high school students, poor knowledge of HIV/AIDS was a predictor of risky practices.[14] A sample of seventh grade students in Puerto Rico had inadequate knowledge of HIV transmission modes and possible preventive behaviors.[15]

Many HIV risk reduction interventions among adolescents have been conducted in the United States, and most reported an increase in knowledge amongst the participants. Intervention programs in adolescents may be strengthened by including the following

recommendations: 1) base the program on a theoretical framework; 2) incorporate community and cultural aspects of target population; 3) include training in coping skills; and 4) consider the duration of the intervention.[20] Interventions should be interesting, fun, and interactive and should involve youth in both their planning and their operation.[21]

To the best of our knowledge, no prospective studies attempting to modify HIV risk behaviors among adolescents in Puerto Rico have been published. In this article, we present an interim analysis of our data after one year of the intervention ASUMA (A Supportive Model for HIV Risk Reduction in Early Adolescents). Our focus is to present data specifically regarding the improvement in HIV/AIDS knowledge after the first year of intervention. The study objectives were 1) to describe the sociodemographic characteristics and HIV/AIDS knowledge among Puerto Rican early adolescents participating in the ASUMA project; and 2) to assess changes in the knowledge of HIV/AIDS between the intervention and control groups after the first year of the program.

METHODS

ASUMA is an intervention pilot program based on a theoretical framework on a parent and adolescent supportive model. The goal of this pilot project is to develop, implement, and evaluate an adolescent and parent support intervention to modify HIV risk behavior among early adolescents in Puerto Rico. Pragmatic strategies to facilitate the process of active learning were included. The intervention considers cultural aspects of the target population; it also includes training in coping skills and considers the duration of the intervention. The setting of the study was four conveniently selected junior schools. Participants aged 11–14 years were invited to participate; informed consent was obtained from a parent or guardian. Schools were randomly assigned to the intervention or comparison group (one public school and one private school in each group). From 224 adolescents invited to participate in the study, 173 (77%) were enrolled. We obtained a control vs intervention group ratio of 1.11 (91/82). These students will be monitored for three years, until they reach the ninth grade.

The measurement instrument was a self-administered questionnaire. The instrument validation was performed in terms of face and content validity and construct validity. First, we interviewed key informants to provide additional insight into our study group. Key informants were school counselors, social workers, teachers, and school directors. Next, a preliminary self-administered questionnaire was developed and was submitted to expert (three persons) and nonexpert (three persons) peer review. Recommendations were given, analyzed, and discussed and, when relevant, incorporated into the questionnaire. Two focus groups were then conducted with seventh graders: one in a public school (five boys and five girls) and one in a private school (five boys and five girls) to obtain reactions about the instrument. The questionnaire was not completed by the focus groups. The focus group discussions were transcribed and discussed. The results obtained from these exercises allowed us to redefine the interventions and the self-administered questionnaire. The final questionnaire was approved by the institutional review board at the Universidad Central del Caribe.

We developed a curriculum and measurement instruments for each of the intervention activities. A total of four workshops were conducted in the first implementation year. Participants were provided with snacks and a certificate for completing the workshops. The first two-hour workshop was developed to increase HIV/AIDS knowledge. In the next three workshops, we emphasized the previous HIV/AIDS knowledge and integrated it with different activities designed to reduce HIV risk behavior in this population. A pragmatic approach was used to develop the methods and activities for the first workshop; activities included group discussion, audiovisual aids, debates, brainstorming, patient testimony, reflection, and critical thinking. The control group did not attend the workshop but received written HIV/AIDS educational material.

In this paper we present and discuss the following variables gathered from the participants in both groups: HIV/AIDS knowledge (40 items scale), sociodemographic information (age, sex, marital status of parents [married, divorced, single or live together]), perceptions about ability to have a good conversation with their parents, as well as risk variables (alcohol use, drugs use, and sexual relations). The HIV/AIDS knowledge scale we used was developed by Paniagua et al[13] for adolescents (ages 10–21 years) and was later translated into Spanish, which was deemed appropriate for use in a Puerto Rican adolescent sample. The construct validity was assessed by internal consistency using Cronbach α, the correlation coefficient used to estimate the degree of equivalence between answers to sets of questions about a specific topic.[22] In most studies, the minimal acceptable level of internal consistency reliability is .70.[22]

Descriptive (frequencies and percentages) and inferential analysis (nonparametric paired comparisons using sign test and Wilcoxon signed rank test) were performed by using SPSS 14.0 (SPSS, Inc., Chicago, Ill). The Wilcoxon signed rank test allowed us to evaluate the size of the differences between two paired HIV/AIDS knowledge scores. This test is a more sensitive nonparametric statistical test that takes into account the magnitude and the direction of changes. Differences were considered significant at $\alpha = .05$.

Table 1. Sociodemographic and risk behavior profile of Puerto Rican early adolescents

Sociodemographic Factor or Risk Behavior	*n*	%
Sex		
Boys	87	50.3
Girls	86	49.7
Age		
11	20	11.9
12	124	73.8
13	11	6.5
14	2	1.2
Alcohol use		
Yes	44	26.3
No	123	73.7
Sexual activity		
Yes	2	1.2
No	162	98.8
Believe that they could have a good conversation with their parents		
Yes	132	78.6
No/sometimes	36	21.4
Marital status of parents		
Marriage	106	63.9
Divorced	34	20.5
Singles	16	9.6
Live together	7	4.2
Widow	3	1.8

RESULTS

The sociodemographic and risk behavior profile of our adolescents is shown in Table 1. Most of the adolescents were 12 years of age at study entry (73.8%). Similar proportions were seen among boys (50.3%) and girls (49.7%). These proportions are similar to those of the 2000 US Census data for Puerto Rico. Adolescents did not report illicit substance use, but 26.3% reported alcohol use at any point in their lives. Only 1.2% reported having sex at any time in their lives. Most of their parents were married (63.9%), and most of them (78.6%) believed that they could have a good conversation with their parents.

A good internal consistency was obtained at the HIV/AIDS knowledge scale 65 (Cronbach α=.81). Figure 1 shows the results from the baseline and postintervention HIV/AIDS knowledge measures. To detect any significant difference between the baseline and the post intervention results nonparametric statistics were used due to the rejection of normality hypothesis. HIV/AIDS knowledge was the same in the intervention and control groups at baseline (median 19). An increase in knowledge was observed when we compared the baseline and followup measures from the intervention group (median 19 vs median 22, $P<.001$), while no change was observed in the control group.

In Figures 2 and 3 we show the HIV/AIDS knowledge score for each study group, controlled by sex. A significant increase in knowledge was found in the intervention group after controlling for sex (boys: baseline median 18 vs followup median 21; girls: baseline median 17.5 vs followup median 22).

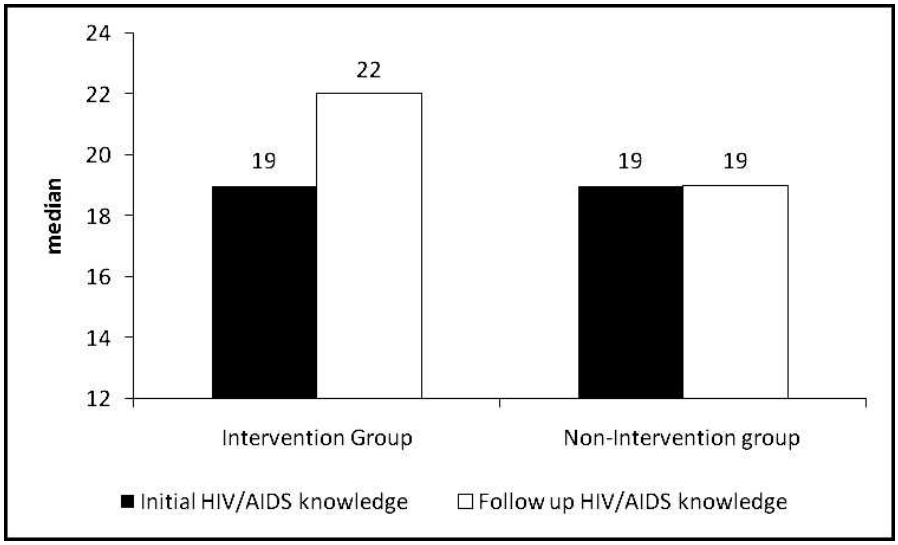

Fig 1. Changes in HIV/AIDS knowledge among a cohort of Puerto Ricans early adolescents: intervention and control. *Within intervention:* Intervention group (*n*=71): *P*(sign test)<.001; *P*(Wilcoxon signed rank test)<.001; Non-intervention group (*n*=83): *P*(sign test)=.649; *P*(Wilcoxon signed rank test)=.905.

DISCUSSION

We present an evaluation of changes in HIV/AIDS knowledge among early adolescents in Puerto Rico after a culturally adapted intervention. The ASUMA project is focused on a theoretical framework that proposed to explain why early adolescents have HIV risk behaviors (drug use and sexual activity) based on the developmental characteristics of adolescents.[20] The social learning theory was used to develop the interventions. One of the

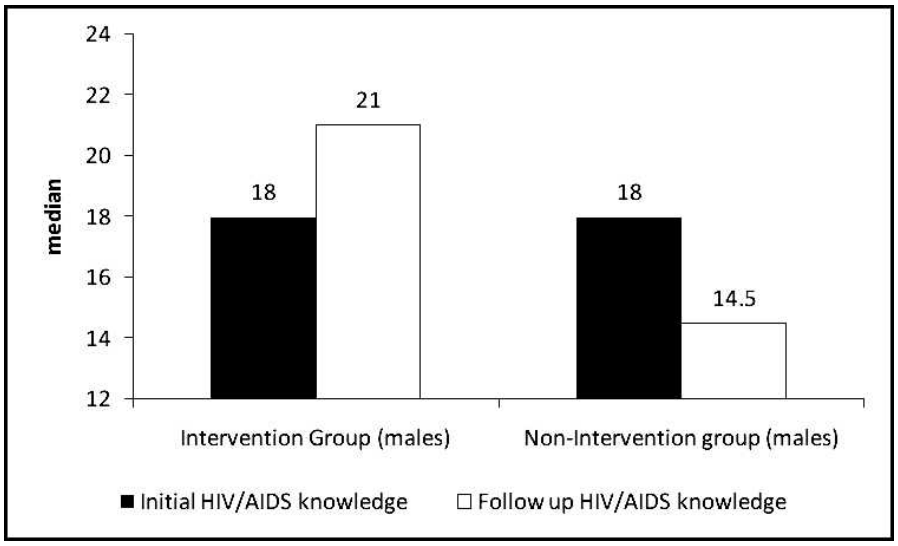

Fig 2. Changes in HIV/AIDS knowledge among a cohort of Puerto Rican male early adolescents: Intervention and control group. *Within intervention*: Intervention group (*n*=41): *P*(Sign test)=.05; *P*(Wilcoxon signed rank test)=.02; Non-intervention group (*n*=38): *P*(Sign test)=.39; *P*(Wilcoxon signed rank test)=.16.

variables involved in this framework was HIV/AIDS knowledge.

Our study found a higher proportion of adolescents reporting alcohol use at baseline than did Moscoso et al (26.3% vs 22%).[12] Use of drugs and alcohol is a major risk behavior since it may reduce inhibitions and impair decision making. Multiple studies have established a relationship between alcohol use and sexual activity.[6,10]

Knowledge is one of the main factors that promotes healthy behaviors and reduces risk-taking. An increase in HIV/AIDS knowledge was observed in our intervention group, which indicates the effectiveness of the ASUMA project curriculum.

As risk and protective factors may affect children at different times in their lives, studies directed at identifying earlier risks may be more effective in modifying risk behavior and ultimately preventing disease. The pathways to HIV/AIDS are related to the number of risks a child is exposed to. Therefore, intrapersonal, interpersonal and social risks should be taken into account to define the intervention and prevention strategies. Reducing HIV infection and increasing safety practices will improve the healthcare disparities often experienced in minority communities.[4]

Early adolescents are more likely to engage in risk behavior, which makes this population particularly vulnerable to HIV infection. Preventive programs designed for adolescents should include HIV/AIDS knowledge content and workshops with pragmatic strategies to facilitate the process of active learning. This study illustrates the importance of culturally appropriate instruments and interventions in the communities at particular risk of HIV infection. A limitation of this study is that the sample is not probabilistic but is represented by both public schools and private schools in Puerto Rico.

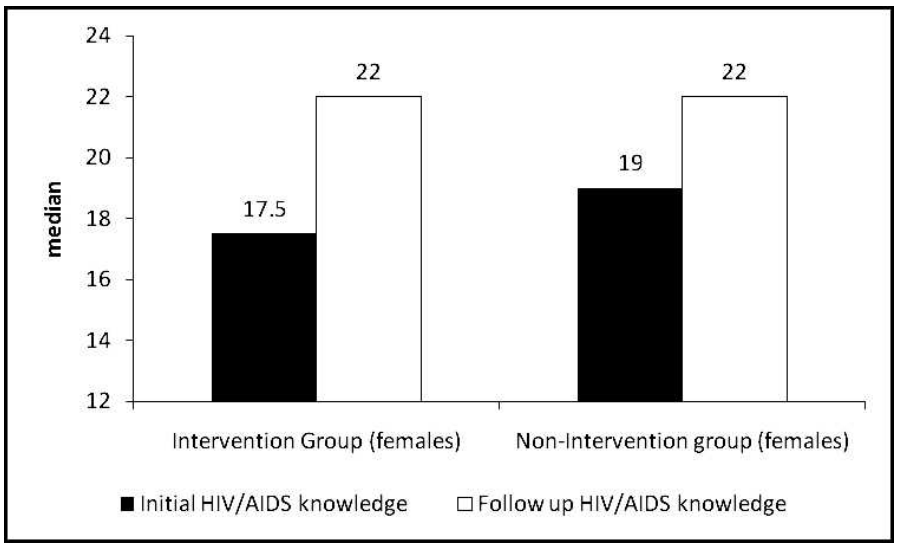

Fig 3. Changes in HIV/AIDS knowledge among a cohort of Puerto Rican female early adolescents: Intervention and control group. *Within Intervention*: Intervention group (*n*=30): *P*(sign test)<.001; *P*(Wilcoxon Signed rank test)<.001; Non-intervention group (*n*=51): *P*(sign test)=.13; *P*(Wilcoxon signed rank test)=.21.

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