

Sexual Risk Behaviors among Racial/Ethnic Minority female adolescents transitioning into young adulthood

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미국 소수인종 여성 청소년의 위험 성행동

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초 록

배경 및 목적: 성병 감염, 조기 성경험, 다수의 성관계 파트너 등과 같은 위험 성행동은 여성의 건강 전반을 위협하는 결과를 초래할 수 있다. 하지만, 이러한 심각성에 비하여, 미국의 청소년기 및 청년기 여성의 위험 성행동을 소수인종 집단별 특성을 고려한 연구는 부족한 실정이다. 그러므로 본 연구는 미국 소수인종 여성 청소년의 위험 성행동에 대한 실태를 조사하고자 한다.

방법: 본 연구는 2차 자료 분석의 결과물로서, 원자료인 미국의 National Longitudinal Study of Adolescent Health (Add Health)의 1기 (1995년)와 3기 (2001년)의 자료 중 여성 청소년의 자료를 바탕으로 분석되었다. 다양한 위험 성행동을 인종별로 분석함과 더불어 본 연구의 특징은 중단적 성병 감염 행태를 인종별로 분석한 점이다.

결과: 본 연구는 소수인종 여성의 위험 성행동에 관한 핵심적인 결과를 제시한다. 성병 감염, 조기 성경험, 다수의 성관계 파트너 등과 같은 위험 성행동의 분포는 흑인과 아시아계 여성이 타인종의 여성에 비하여 높은 위험에 처해 있는 것으로 나타났다. 본 연구의 흑인 여성들은 전반적인 성행동을 망라하여 고위험군으로 분류되고 있다. 아시아계 여성 역시 고위험 군으로 분류되는데, 특히, 청소년기에 성병에 한번 감염된 경험이 있는 아시아계 여성은 가장 위험한 성병 감염 행태를 보이고 있는 것으로 나타났다.

결론: 본 연구의 결과는 소수인종 여성의 위험 성행동이 백인보다 전반적으로 높은 편으로 나타나지만, 적절한 보건 의료 서비스에서는 소외되는 현실을 지적하고 있다. 이러한 인종별 성건강의 불균형 문제 해소를 위하여 청소년들에게 인종적 특성과 서비스 접근성의 고려가 절실히 필요하다고 사료된다.

Key words: Racial/ethnic minority adolescents, Sexually risk behaviors, Sexually Transmitted Diseases (STDs)

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I . INTRODUCTION

Adolescents and young adults are at higher risk for acquiring sexually transmitted diseases (STDs) compared to older adults (Centers for Disease Control and Prevention, 2011). Recent estimates of new STDs in 2010 among 15 to 24 year olds demonstrate that adolescents and young adults acquire nearly half of all new STDs although teens and young adults represent only 25% of the entire sexually active population (Centers for Disease Control and Prevention, 2011; Weinstock, Berman, & Cates, 2004). Females 15 to 19 years of age and 20 to 24 years of age have the first and second highest rates of gonorrhea compared to every other age and gender category (Centers for Disease Control and Prevention, 2011). Among adolescents and young adults, although males are more sexually active than females, females are also at high risk for STDs due to a combination of biological, behavioral, and cultural reasons (Mosher, Chandra, & Jones, 2005; Males, 1992).

In addition to the burden of STDs among females, sexual risk behaviors that increase the likelihood of transmitting STDs are reported at higher rates among these groups. For instance, although large numbers of the negative consequences caused by early sexual debut do not emerge until adulthood (Johnston, O'Malley, & Bachman, 2003), this behavior carries its own risks including sexually transmitted infections, unplanned pregnancy, unprotected sexual intercourse, and an increased number of total lifetime partners (Kaestle, Halpern, Miller, & Ford, 2005; Niccolai et al., 2004; Santelli et al.,

1998; Smith, 1997). Furthermore, females who have multiple sexual partners reported the increased possibility of a female's exposure to partners who may have an STD, and as a consequence, those females have higher risks of STD infection (Department of Health and Human Services, 2000).

Comprising nearly 30 percent of all females in the U S. (Health Resources and Services Administration, 2003; Smith & Spraggins, 2001), racial/ethnic minority women suffer from the persistent burden of STDs and sexual risk behaviors. African American, Native American, and Hispanic females all have higher STD rates than White females (Centers for Disease Control and Prevention, 2011). The Hispanic population has rates of chlamydia, gonorrhea, and primary and secondary syphilis that are two to three times higher than those of their White counterparts (Centers for Disease Control and Prevention, 2007). Recent epidemiologic study reported that in particular, majority of African American girls (57%) reported that their first consenting experience with sexual intercourse was at 14 or younger (Bachanas et al., 2002). Although Asian American and Pacific Islander (API) population is one of the fastest growing racial/ethnic minorities in the United States (Census Bureau, 2004); relatively few studies have examined STDs and sexual risk behaviors for API females. API females shows the highest increased gonorrhea cases compared to Hispanics, Whites, and American Indians (Centers for Disease Control and Prevention, 2004). Although API adolescents report lower involvement with sexual activity than all other racial/ethnic peer groups, API adolescents have

sexual behavior patterns comparable to other adolescent groups once they initiate sexual activity (Cochran, Mays, & Leung, 1991). Therefore, these findings suggest that racial/ethnic females, as compared to White females, are at greater sexual risks which can have significant adverse outcomes beyond an impact on their health.

Although existing studies point to alarming conclusions about the high prevalence of STDs and sexual risk behaviors, there are few empirical studies of females only, and among the mixed-gender studies, there are few gender-specific analyses, which are separate analyses of male and female subjects. Only a few studies could be found that focused only on female populations, and the remainder of the studies, which were few, provided gender-specific analyses. Considering that females are more vulnerable in terms of STD risks, studies exclusively of females or large number of females with gender specific analyses are necessary to develop strategies to eliminate disparities. Furthermore, although recent findings demonstrated that race/ethnicity is significantly associated with STDs and sexual risk behaviors among females, studies on racial/ethnic differences among females are insufficient to enhance existing strategies exclusively tailored to these populations (Upchurch et al., 2004; Crosby et al., 2000). Therefore, racial/ethnic-specific research is necessary for developing strategies to eliminate sexual health disparities among racial/ethnic minority females.

The primary purpose of this study is to advance our understanding of STDs and sexual risk behaviors among racial/ethnic minority

females. The specific aims of the current study are as follow;

Specific Aim 1:

To estimate, among females who differ by racial/ethnic group, the proportions who have a history of self-reported STD diagnosis, early sexual debut, and multiple sex partners, and the longitudinal pattern of STD acquisition.

Aim 1-1.

What proportions of racial/ethnic minority females have ever had a history of self-reported STDs, early sexual debut, and multiple sex partners (in Wave 1 and Wave 3)?

Aim 1-2.

What is the longitudinal pattern of STD acquisition between Wave 1 and Wave 3 among females who differ by racial/ethnic group?

II . METHODOLOGY

1. Data Source and Sample

A secondary data analysis was undertaken using the National Longitudinal Study of Adolescent Health (Add Health) Wave 1 and Wave 3 data. Add Health is a longitudinal school-based study of the health-related behaviors of adolescents in grades 7-12 in the United States (Harris et al., 2003). To ensure privacy and reduce reporting bias, Add Health researchers used audio computer-assisted

interviewing technology for eliciting sensitive questionnaire content on issues such as sexual behaviors, contraception, and substance use. The present study utilized Wave 1 and Wave 3 interview data on adolescent and young adult females. All Add Health study procedures involving human subjects were reviewed and approved by the University of North Carolina Institutional Review Board. The use of these data for the present study was approved by the Boston University Institutional Review Board.

2. Measurement

Items in the Add Health study were drawn from standardized and validated instruments used in national and state surveys of adolescents. *Race/Ethnicity* was based on the respondent's self-report. Adolescents were asked to identify their primary racial/ethnic affiliation: White, Hispanic, African American, and Asian American and Pacific Islander (API). Hispanic ethnicity reflected the respondent's self-report of Hispanic origin. *Age* was measured in years at the time of the Wave 1 in-home interview. *History of self-reported STD diagnosis* (Waves 1 and 3) was measured using this questionstem for each of the following eight STDs: "Have you ever been told by a doctor or nurse that you had" (a) chlamydia, (b) syphilis, (c) gonorrhea, (d) HIV/AIDS, (e) genital herpes, (f) genital warts, (g) trichomoniasis, and (h) human papilloma virus (HPV). Responses were added and dichotomized; a score of 1 indicates having been diagnosed with at least one STD, while a score of 0 indicates no diagnosis. *Having an early sexual debut* (Wave 3) was determined with this

question: "How old were you the first time you had vaginal intercourse?" Answers indicating having had sex before age 15 were coded as 1 answers indicating having had sex at age 15 or after age 15 were coded as 0. *Having multiple sex partners* (Wave 3) was assessed by this question: "With how many different partners have you had vaginal intercourse in the past 12 months?" Answers indicating having had more than one sex partner in the past 12 months were coded as 1 answers indicating having had sex with only one sex partner or no sex partners were coded as 0.

3. Statistical Analysis

1) Handling Design Effects

To account for the clustered sampling design, regional stratification, and population weights, all the statistical analyses were performed by using Stata 9.0 and SAS 9.0. Based on survey commands such as SVYLOGIT or SVYMEANS, Stata was designed to handle probability sampling weights and stratification, which were necessary for analyzing the Add Health data set (Stata Corp., 2003). Of the 10,324 White, African American, Hispanic, and API females from Add Health Wave 1, 1,662 White females, 798 African American females, 658 Hispanic females, and 312 API females were excluded as a result of lack of sexual experience or nonresponse to the question on sexual experience.

2) Longitudinal Patterns of STD Acquisition

To understand the longitudinal patterns of

STD acquisition among females, four categories of STD acquisition status were created: (a) the never infected group (no-no), those who did not have STDs in either wave (b) the infected group (no-yes), those who did not have STDs in Wave 1 but who acquired STDs in Wave 3 (c) the no longer infected group (yes-no), those who had STDs in Wave 1 but had been cured or did not have STDs in Wave 3 and (d) the still infected/recurrence group (yes-yes), those who had STDs in both waves. In terms of “still infected/recurrence” group, many of the most common STDs such as bacterial infections like chlamydia, gonorrhea, and syphilis are treatable and curable, although viral STDs such as herpes are incurable but treatable (Gutmacher Institute, 2007). Therefore, once young females were diagnosed with STDs by a doctor or nurse, the chance to get treatment and be cured from STDs was very high. Therefore, the fact that females have STDs in both waves

indicated that they never got treatment, or got treatment but acquired STDs again in spite of being treated once, or acquired STDs again in spite of being treated twice or more.

III. RESULTS & DISCUSSION

1. Sample Characteristics

The sample comprised young females from four racial/ethnic backgrounds: Whites, 54.5%; African Americans, 23.7%; Hispanics, 14.9%; and APIs, 6.9% (Wave 1). The age range of the sample was 11 to 20 years in Wave 1, the majority of the sample being 13 to 18 years old (nearly 90%). The mean age of the females was 15.07 years (SD = 1.72 years). Almost 40% of the females were sexually active in Wave 1, a proportion that more than doubled (88.1%) in Wave 3.

2. Proportions of STDs and Sexual Risk Behaviors

<Table 1> Weighted Percentages of Sexually Active Females who had STDs, Early Sexual Debut, and Multiple Sex Partners, by Race/Ethnicity

		Total	Whites	African Americans	Hispanics	APIs	P-value
STDs	W 1	10.3 (0.09-12.40)	7.7 (0.06-0.10)	18.9 (0.15-0.24)	8.7 (0.05-0.14)	9.6 (0.03-0.29)	*** 0.00 ^a
	W 3	11.0 (0.10-0.12)	8.4 (0.07-0.10)	21.6 (0.19-0.25)	10.3 (0.07-0.14)	13.9 (0.08-0.22)	*** 0.00 ^b

		Total	Whites	African Americans	Hispanics	APIs	P-value
Early sexual debut	W 1	9.1 (0.08-0.11)	8.5 (0.07-0.11)	12.1 (0.10-0.15)	9.4 (0.07-0.13)	5.2 (0.03-0.08)	* 0.02^c
	W 3	19.0 (0.17-0.21)	18.7 (0.17-0.21)	22.3 (0.19-0.26)	17.0 (0.13-0.22)	14.4 (0.10-0.20)	+ 0.08^d
Multiple sex partners	W 1	10.3 (0.09-0.12)	11.0 (0.09-0.13)	12.1 (0.10-0.14)	9.4 (0.07-0.11)	5.2 (0.03-0.07)	*** 0.00^e
	W 3	26.8 (0.25-0.29)	26.2 (0.24-0.28)	34.0 (0.31-0.38)	20.2 (0.16-0.25)	24.7 (0.16-0.32)	*** 0.00^e

* p < .05. ** p < 0.01. *** p < 0.001. +p<0.10.

Note: percentages incorporate population-based sampling weights. For the survey adjusted chi-square test, p-values are calculated from an approximate F distribution. Figures in parentheses accompanying percentages are 95% confidence interval.

^a 0.00: Test for racial/ethnic difference of STDs in Wave 1

^b 0.00: Test for racial/ethnic difference of STDs in Wave 3

^c 0.02: Test for racial/ethnic difference of early sexual debut in Wave 1

^d 0.08: Test for racial/ethnic difference of early sexual debut in Wave 3

^e 0.00: Test for racial/ethnic difference of multiple sex partners in Wave 3

<Table 1> shows the proportions of sexually active females who had histories of self-reported STD diagnoses, early sexual debut, and multiple sex partners. Population-based sampling weights were incorporated in the reported estimates. Among sexually active females, approximately one out of ten had STDs in Wave 1 and Wave 3 (10.3% and 11.0%, respectively). The proportion of STDs was highest among African American females in both Waves 1 and 3 (18.9% and 21.6%, respectively), followed by API females (9.6% and 13.9%), Hispanic females (8.7% and 10.3%), and White females (7.7% and 8.4%).

The total of those who had sex before age 15 in Wave 1 was 9.1%; those having early sexual debuts increased to 19.0% in Wave 3. Of those

having early sexual debuts, African American females had the highest proportion in both waves (12.1% and 22.3%). In contrast, API females had the lowest proportion in both waves (5.2% and 14.4%).

In Wave 3, the total of those who had multiple sex partners was 26.8%. In Wave 3, one out of three African American females had multiple sex partners (34.0%), the highest proportion across race/ethnicity groups, while Hispanics had the lowest proportion of multiple sex partners (20.2%). Overall, African American females had higher rates of STDs, early sexual debut, and multiple sex partners than other racial/ethnic groups.

3. The Longitudinal Pattern of STD Acquisition

<Table 2> Weighted Percentages of Sexually Active Females Who had STDs between Wave 1 and/or Wave 3, by Race/Ethnicity

(N=2,643)					
Wave 1 & 3	Total	White	African American	Hispanic	API
“Never infected” (no-no)	78.6 (0.76,0.81)	84.1 (0.81,0.87)	61.8 (0.56,0.67)	77.6 (0.70,0.84)	79.8 (0.61,0.91)
“Infected” (no-yes)	11.1 (0.09,0.13)	8.1 (0.06,0.10)	19.1 (0.16,0.23)	14.2 (0.09,0.21)	10.8 (0.04,0.27)
“No longer infected” (yes-no)	8.2 (0.07,0.10)	6.9 (0.05,0.09)	13.7 (0.10,0.18)	7.2 (0.04,0.13)	1.7 (0.00,0.07)
“Still infected/ Recurrence” (yes-yes)	2.0 (0.01,0.03)	0.8 (0.00,0.02)	5.4 (0.04,0.08)	1.0 (0.00,0.03)	7.7 (0.02,0.30)

P value = 0.000***^a

* $p < .05$, ** $p < 0.01$, *** $p < 0.001$, + $p < 0.10$.

Note: percentages incorporate population-based sampling weights. Figures in parentheses accompanying percentages are 95% confidence interval. For the survey adjusted chi-square test, *p*-values are calculated from an approximate F distribution.

^a 0.000: Test for racial/ethnic difference across four patterns of STD acquisition within each wave

<Table 2> shows the longitudinal pattern of STD acquisition among sexually active females. In determining the estimates shown, the researcher incorporated population-based sampling weights. Between Waves 1 and 3, the highest proportion of sexually active females was categorized as the never infected group, those who did not have STDs in either wave (78.6%). The infected group, those who did not have STDs in Wave 1 but who acquired STDs in Wave 3, was 11.1% the no longer infected group, those who had STDs in Wave 1 but had been cured or did not have STDs in Wave 3, was 8.2%. The still infected/recurrence group, those who had STDs in both waves, was 2.0%.

Across racial/ethnic groups, based on differences within each group, the smallest never infected group and the largest infected group were among African American females (61.8% and 19.1%). On the other hand, White females constituted the largest never infected group (84.1%) and the smallest infected group (8.1%). African American females and White females revealed opposite patterns of STD acquisition for the never infected group and the infected group. However, African American females also constituted the largest no longer infected group (13.7%), although they were the largest infected group among other racial/ethnic groups.

Although African American females are at greater risk of having STDs than are other racial/ethnic groups, Hispanic and API females are also at greater risk than White females. A lower proportion of Hispanic and API females were in the never infected group (77.6% and 79.8, respectively) compared to the proportion of White females (84.1%). Furthermore, a higher proportion of Hispanic and API females were in the infected group (14.2% and 10.8%, respectively). Specifically, API females constituted the highest proportion of females in the still infected/recurrence group (7.7%) and the lowest proportion of females in the no longer infected group (1.7%), placing API females at significant risk of STD acquisition. Therefore, findings suggest that Hispanic and API females, in addition to African American females, have patterns that put them at high risk for STD acquisition.

4. Discussion: Racial/ethnic Disparities in STD Risk among Females

Overall, African American females have greater sexual health risks than any other racial/ethnic group, as evidenced by the fact that greater proportions of African American females self-reported STDs, early sexual debut, and multiple sexual partners during both adolescence and young adulthood. Among Hispanic females and White females, relatively lower proportions had a history of STDs, early sexual debut and multiple sex partners when compared to African American and/or API females.

In addition, the longitudinal pattern of STD

acquisition among African American females puts them at high risk. African American females were the smallest group (approximately 60% compared to close to 80% for the other racial/ethnic groups) in the “never infected” category that is, those who did not have STDs in both waves. Further, African Americans were the largest group (nearly 20% compared to 8.1% and 10.8%, respectively, for White and API females) in the “infected” group, that is, those who did not have STDs in wave 1 but acquired STDs in wave 3. This result is congruent with findings of the Minnesota Department of Health in 2006 which revealed that the incidence rate of chlamydia and gonorrhea among African Americans was 15 times and 35 times higher than the rate among Whites. In addition, more than 62% of chlamydia cases and over 50% of gonorrhea cases among African Americans were among females (Minnesota Department of Health, 2007). Therefore, this study, along with previous research findings, has indicated the high prevalence and incidence of STDs, sexual risk behaviors, and high risk patterns of STD acquisition among African American females.

In addition to African American females, API females are at risk of STDs and sexual risk behaviors. The results from this study are in keeping with Upchurch and Kusunoki's finding that API females are more likely to have STDs relative to White females (Upchurch & Kusunoki, 2004). API females had the second highest proportion of self-reported STD diagnoses, which was higher than that among White females and Hispanic females, although API females had lower proportions of having early sexual debut and multiple sex partners

than White and African American females. In addition to the higher proportion of STDs, the longitudinal patterns of STD acquisition also put API females at high risk. Although APIs were well represented in the “never infected” group (the second highest proportion), they had the lowest proportion of “no longer infected” or cured females and the highest proportion of females in the “still infected or recurrence” group. In other words, API females had lower proportions of being no longer infected or cured from STDs during young adulthood and higher proportions of “still infected” or STDs that recurred in young adulthood than White, African American, and Hispanic females. For APIs, the “still infected or recurrence” group was almost seven times higher than that among White females, and the “no longer infected” group was approximately seven times lower than among African American females. As a result, once API females were infected with STDs, they had the highest likelihood of remaining infected or developing a recurrence of STDs. Many common STDs are treatable and curable (Gutmacher Institute, 2007). This means that once API females in this highest “still infected or recurrence” group were diagnosed with STDs by a doctor or nurse, the chance for them to get treatment and be cured was very high. However, the fact that API females had more STDs during both adolescence and young adulthood compared to females from other races/ethnicities suggests that once APIs were infected with STDs, they either stayed that way or got treatment and then re-acquired STDs in spite of having gotten treatment. Therefore, API females who had STDs once are the highest

risk group among all other females.

What explains these racial/ethnic disparities in STD risk among females? One compelling explanation is the limited access to health care in general among racial/ethnic minority females. Besides, their access to quality health care is often inadequate. For instance, physicians treating African American patients were less likely to have board certification in their primary specialty and more often practiced in low income neighborhoods, and than physician treating white patients (Bach et al., 2004). Furthermore, their utilization of health care are worse than that of their White counterparts, that is, they may not go for visits as frequently or ask questions of doctors when they have visits. For instance, racial/ethnic minority females reported delays of care and have markedly more difficulty seeing a specialist when needed. Substantial minority females reported trouble affording necessary prescriptions as evidenced as follows; between 20% and 25% of females reported that they did not fill a prescription because of cost (Kaiser Family Foundation, 2004). In a large-scale analysis of racial and ethnic disparities, the Institute of Medicine concluded that “Bias, prejudice, and stereotyping on the part of health care providers may contribute to the differences in care” (Institute of Medicine, 2002). Therefore, the use of services among racial/ethnic minority females may be influenced by experiences of racism on the part of the health care institution or the individual health care provider, or anticipated racism based on past life experiences.

The other possible explanation is that there

are social, cultural, and environmental differences between Whites, African Americans, Hispanics, and APIs. Recent findings suggest that sexual mating patterns in many races are assortative, that is, individuals of one race avoid having sex outside their racial group (Ford, Sohn, & Lepkowski, 2002; Laumann & Youm, 1999). Thus, assortative mating refers to mating patterns in relation to race. Dissortative mating indicates that members of a racial group have sex with both high risk and low risk individuals. Thus, dissortative mating refers to mating patterns in relation to risk of infection.

Lauman and Youm (1999) have defined the sexual mating patterns of African Americans as both assortative and disassortative mixing. First, the assortative mating of African Americans illustrates that African Americans are somewhat distant from other racial/ethnic groups, often having sex only with members of their own race. Considering STDs, in the case of assortative mating, infections would therefore remain inside the African American population. Second, the dissortative mating of African Americans exemplifies that African Americans are more likely than Whites to cross boundaries between high risk groups and low risk groups when choosing sexual partners. Dissortative mating is considered to be primarily responsible for the existence of STDs in the African American population over time. Specifically, dissortative mating refers to the mating patterns between low risk African Americans who have had only one sexual partner in the past year and who are therefore considered to be safe from infection, and high risk African Americans who have had at least four sexual partners in the

same period and are therefore at high risk for infection (Laumann & Youm, 1999). Comparatively high rates of sexual contact between the high risk group and the low risk group of African Americans has a network effect that makes infections overflow into the entire African American population.

This combination of assortative mating by race and disassortative mating by high-low risk groups may produce a “perfect storm” impact for African Americans that induces extremely high STDs and HIV rates. Given the fact that sexual partners’ infection status is the most significant determinant of STD acquisition, both high- and low-risk African Americans are more likely to have an infected partner given this combination of assortative and disassortative mixing (Hallfors, Iritani, Miller, & Bauer, 2007).

Therefore, the racial/ethnic differences related to STDs that have been found in this study could be appropriately explained by the sexual mating patterns of African American females. However, the role of sexual mating patterns among API females is unknown; therefore, future studies should investigate sexual network patterns among APIs.

IV. CONCLUSION

The strengths of this study include, first, the use of a large nationally representative sample; second, a full description of the longitudinal patterns of female STD acquisition that occur between adolescence and young adulthood; third, the use of Audio Computer-Assisted Self-Interview (A-CASI) for confidentiality on

sensitive topics, such as sexual behavior and history of STDs. Primary prevention of STDs begins with changing the sexual behaviors that place persons at risk for infection. Therefore in examining the four patterns of STD acquisition, the “never infected” group would benefit most from primary prevention efforts. The “infected” group would benefit most from intervention strategies to improve their prognosis. The “still infected or recurrence” group would benefit most from intervention focused on reducing the risk of onward transmission through effective counseling, education, and treatment. Therefore, it is essential to consider the longitudinal pattern of STD acquisition in order to provide differentiated and targeted prevention and intervention services to reduce STD risks.

It is important to note that this study has a number of limitations. First, STDs and sexual risk behaviors were measured via self-report. Studies have observed sizeable underreporting of self-reported STDs, as compared with the STDs based on biomarker data (Clark et al, 1997; Hornberger et al., 1995). Potential causes for self-report underestimation include (a) subject underreporting (due to failure to recall, social stigmatization, embarrassment or misunderstanding of a diagnosis (Harrington et al., 2001; Laumann & Youm, 1999), (b) asymptomatic infections (subjects might not have known that they had an infection), and (c) lack of screening in high-risk populations (without screening, subjects might not have received a diagnosis). Using biomarker data was an alternative for this study, however, the decision was made to use self-report data instead. In wave 3, Add Health had collected

biomarker testing results on four STDs: HIV, chlamydia, gonorrhea and trichomoniasis. However, given the low occurrence of these four STDs among the four different racial/ethnic groups studied here, this study used self-reported STD results because the self-report data focused on a wider range of STDs. One implication of potential systemic STD underreporting is the confounding of findings from intervention trials that use self-reported STD history as one indicator of research evaluating the efficacy of STD/HIV prevention and interventions (Harrington et al., 2001). Second, Add Health data is a school based survey with data collected among more conventional and integrated adolescents. Adolescents, who have dropped out of school, homeless adolescents, adolescents who reside in hospitals or prisons may have been excluded because data gathering occurred at school. Such are more likely to engage in health risk behaviors. Although the findings are limited to those who were enrolled in school, a recent evaluation of the adequacy of the sampling of Add Health suggests that bias arising from school dropouts could be minimal (Udry & Chantala, 2003). Third, this study combined multiple STDs in a single measure to maximize the proportions of STDs. Different STDs could have distinct patterns of occurrence, possibly affecting observed results. For instance, chlamydial infection was the most predominant STD in this sample; however, using a composite STD outcome measure limits the study's capacity to interpret the results for any single STD.

For preventing STDs and sexual risk

behaviors in racial/ethnic minority females, specific practice and policy strategies for intervention should be adopted. Addressing racial/ethnic disparities in STD risks is extremely sensitive, and practitioners and policy makers must proceed carefully, based on agreement among all community groups. Helping affected communities to acknowledge sexual health disparities among females is one of the first steps in remediation, followed by empowering affected communities to organize and advocate for resources to address this problem. The efforts of public health and social service practitioners, policy makers, and researchers are needed to work toward the elimination of sexual health disparities and to promote equity in sexual health services among racial/ethnic minority females. Specific approaches are outlined below.

First, identifying the groups at risk of infection is a useful starting point for the development of an understanding of STD risks and for the design and implementation of prevention programs. Given the documented higher risk of STDs among African American and API females, a more comprehensive, effective and targeted approach to reach all African American and API young females is necessary. One of the major barriers to the efforts to prevent STD risks is the high rate of transmission among people who do not know they are infected because a high proportion of STD cases are asymptomatic; for instance, as many as 85% of women with chlamydial infection are asymptomatic (Eng & Butler, 1997). Therefore, making universal STD testing more routine in health care settings would lead

to earlier diagnosis of infection. A media campaign informing young African American and API females who are at risk of STDs might be able to reduce the stigma associated with testing and an STD diagnosis, and encourage adolescent and young females to be tested on an annual basis. Furthermore, information, testing, and treatment services offered through non-traditional venues might be effective in informing a greater number of females. Non-traditional venues include churches and beauty salons, as well as colleges, prison and jail facilities, and health care providers (Hallfors, Iritani, Miller, & Bauer, 2007).

Furthermore, like most observational studies, there are potential biases from unmeasured confounders, such as sexual behaviors, parental rearing practices, cultural values about sexuality, peer pressure, adolescent personality, and socioeconomic dimensions, which may be associated with sexual outcomes. Therefore, future research is needed to understand the complicated relationships among STD acquisition pattern and unmeasured confounders by incorporating reliable and valid measures of STDs and other factors among racial/ethnic minority adolescent females. More information is required on how these dimensions function in various racial/ethnic groups, on the extent to which each dimension relates to another and to other variables, and on identifying the influences of each dimension (Faryna & Morales, 2000).

Over the next few years, anticipated demographic changes in the U.S. will increase the importance of addressing disparities in the sexual health status of racial/ethnic minority

females. Currently, the specific groups of racial/ethnic minorities and females exposed to poorer health status continue to show considerable growth in proportion to the total U.S. population (Webb, 2004). Therefore, the future sexual health of America will be increasingly influenced by the success or failure of improving the health status of African American, Hispanic, Asian American and Pacific Islander females.

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