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The HIV epidemic among adolescents in the United States is inherently tied to individual, psychosocial, and cultural phenomena. Expanding intervention development and implementation to incorporate a broader spectrum of determinants of adolescents’ sexual risk for sexually transmitted infections (STIs)/HIV acquisition may provide an opportunity to prevent disease transmission more effectively. To address the STI/HIV prevention needs of adolescents, we highlight research assessing adolescents’ sexual risk behavior and place the findings in the context of the diverse array of psychosocial factors influencing adolescents. This synthesis provides an opportunity to examine why adolescents engage in risky sexual behavior and to review the effectiveness of theory-based prevention programs. Subsequently, we offer recommendations for improving future programs aimed at reducing the incidence of STI/HIV infection among adolescents. Key words: risk behavior, adolescents, STI/HIV, interventions.

STIs = sexually transmitted infections; AIDS = acquired immunodeficiency disease syndrome; SIHLE = Sistas Informing, Healing, Living and Empowering.

INTRODUCTION

Among the top ten most frequently reported diseases in the United States, sexually transmitted infections (STIs) account for 89% of new cases (1). When compared with other age groups, STIs disproportionately affect adolescents—with prevalence rates among some subgroups reaching epidemic proportions (2–4). Not only do STIs pose significant risks to adolescents in terms of morbidity, they also negatively affect society in terms of economic costs associated with detection and treatment (5). Of particular concern is the increasing health threat posed by HIV (6). In an era when an STI such as HIV can result in a fatal illness like AIDS, we have begun measuring the impact of sexual risk behaviors and their adverse sequelae in terms of number of deaths of young adults who were infected with HIV as adolescents.

Recent evidence suggested that 50% of new HIV infections occur among people <25 years of age (7). Surveillance data suggested that about 16% of all reported AIDS cases resulted from HIV acquisition during the second decade of life (10 to 19 years of age) (8). This finding is especially alarming because adolescents, as a population, are less likely to be sexually active than their adult counterparts. The majority of HIV transmission among adolescents is caused by sexual contact as opposed to other methods, e.g., injection drug use with shared needles and syringes (9,10). Given that STIs such as HIV have significant adverse health and social consequences for adolescents and society, preventing infection represents one of the most urgent public health priorities (11–13).

Although the risk behaviors for STI infection have been articulated in previous literature (14), understanding the antecedents of these behaviors has been a complex and formidable challenge among prevention scientists. The task is particularly daunting because empirical investigation of such a personal and often nonpublic, nondisclosed behavior is logistically complicated. Historically, the STI/HIV epidemic has been viewed largely as an individual-level phenomenon where much effort has been focused on understanding intrapsychic influences that affect adolescents’ decision-making. Consequently, many intervention efforts that target adolescents with the goal of eliminating or reducing specific STI/HIV-associated risk behavior fail to address pervasive contextual influences that directly and indirectly influence disease acquisition.

Within the last decade, health researchers have begun to recognize the value of adopting a socioecological approach to examine individual risk behavior (15). A socioecological approach involves examining individuals’ behavior within the context of their social and physical environment, inclusive of familial, relational, peer, and societal influences (15,16). The integration of these psychosocial influences reciprocally shape one another and collectively affect the balance of risk for STI/HIV infection.

To address the STI/HIV prevention needs of adolescents, we highlight research assessing adolescents’ sexual risk behavior and place the findings in the context of the diverse array of psychosocial factors influencing adolescents. This synthesis provides an opportunity to examine why adolescents engage in risky sexual behavior and to review the effectiveness of theory-based prevention programs. Subsequently, we offer recommendations for improving future programs aimed at reducing the incidence of STI/HIV infection among adolescents.

Psychosocial Predictors of Risk Behavior

Individual

Although adolescents typically perceive HIV as a severe disease, a great deal of variability exists regarding individual perception of susceptibility. Studies have suggested that adolescents who perceive that they are at risk for STIs/HIV tend to engage in less risky sexual behavior than those who do not have these perceptions (17–19). Furthermore, adolescents who


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0033-3174/08/7005-0598
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Received for publication July 11, 2007; revision received December 14, 2007.

DOI: 10.1097/PSY.0b013e3181775e9b
feel confident in using condoms (20–22), in their ability to negotiate condom use with their partners (23), in their ability to refuse sexual intercourse without condom use (24), and in their ability to discuss sexual matters (23,25), tend to use condoms more often and have lower rates of STIs (26).

Additional individual characteristics, such as low self-esteem, psychological distress, sexual abuse, and depression, also place many adolescents at risk for engaging in STI/HIV-associated sexual behaviors (27–31). Adolescents’ STI/HIV risk behavior seems to cluster with other risk behaviors, e.g., alcohol or drug use (32–34), antisocial behavior and delinquency (32), and pregnancy (35). Moreover, adolescents with high levels of impulsivity or who are prone toward sensation-seeking behaviors may place themselves at greater risk for contracting an STI/HIV (36–38).

Family

Adolescent sexual risk behavior has been associated with the family structure. Perceived family support, family cohesiveness, parental monitoring, and parent-adolescent communication about sex have each been shown to help prevent adolescents from engaging in risky sexual behavior (39–43). Parental monitoring is a particularly important familial factor. Evidence has suggested that adolescents who perceive that their parents (or parental figure) know where they are and who they are with outside of the home are substantially less likely to engage in STI/HIV sexual risk behaviors (44–46). In addition, positive parental influence can buffer adolescents against the influence of negative peer norms that could lead to risky sexual behavior (47).

Relationships

Relationship characteristics also play an important role in influencing adolescents’ risk behavior and likelihood of contracting an STI/HIV. Although commonalities exist across gender, some differences are evident in the role that social and intimate relationships play on risky behavior. Key issues that affect females include their lack of relationship control (48), engagement in longer relationships (49,50), fear of condom negotiation with their male partner (24), communicating less frequently with their partner about sex (23), and having older sexual partners (51–54); all of these issues have been associated with greater likelihood of engaging in STI/HIV sexual risk behavior. Emerging research on male partner influences (55) and perceived male partner support (56) as relational risk factors have likewise been documented. For males, partner communication about sex (57,58), belief in contraception responsibility (59), being in the early stages of a relationship (60), and perceptions of partners’ sexual inexperience have been associated with increased condom use (61); thus, acting more as protective factors against risky sexual behavior. Among both males and females, perceived partners’ negative attitude toward condom use has been related to unprotected intercourse and an increased number of sexual partners (61).

Peers

Perhaps one of the most powerful psychosocial influences on an adolescent’s sexual risk behavior is the perception about the behavior of their peers. Although parents have considerable influence on adolescents’ decisions to engage in risk behaviors relative to adolescents’ peers (62), perceived peer norms surrounding sexual behavior and condom use have been shown to also be key influencers of risky sexual behavior. If adolescents and young adults perceive that their friends are having unprotected sex or engage in risky sex, they may be more likely to adopt their friends’ behaviors (17,32,48,63). Similarly, general perceptions of low levels of social support among peers have also been associated with the likelihood of participating in risky sexual behavior (64). In contrast, perceived peer norms supportive of STI/HIV-protective behaviors can have a significant influence on the adoption and maintenance of protective behaviors (32,33).

Society

Societal factors play distinct roles in shaping cultural norms and influencing behavior. Surveillance data indicated that African-American adolescent females are disproportionately affected by STI/HIV relative to other racial/ethnic groups and males (14). The apparent influences of race/ethnicity may be confounded by a variety of environmental factors (65). Societal influences, such as neighborhoods devoid of adequate community resources (66), poor community supervision, and extreme poverty (67), are each likely to influence STI/HIV risk behavior. Among poverty-stricken populations, in particular, incidence of sexual abuse is often high and may play a role in individual risk-taking behavior. Adolescents living in stressful environments are generally more likely to take sexual risks (68,69).

More recently, a dominant influence on the sexual health of adolescents is the media. Implicit and explicit sexual imagery coupled with situations depicting unprotected sexual intercourse, violence, and aggression toward females is ubiquitous (70). There is evidence of an association between both exposure to rap music (71) and pornographic movies (72) with greater levels of problem behavior and more sexual risk taking. Unfortunately, little is known about the psychosocial mechanism that might explain the observed associations between the media and adolescent risk behavior. Recent studies suggested that one potentially important community-level predictor of adolescents’ sexual risk behavior may be their affiliation with organized social groups (73–76). Future research in this area is warranted.

Intervention Efficacy

To date, a number of programs have been developed that address prevention and control of STI/HIV risk behavior and the modification of psychosocial mediators (i.e., attitudes, perceived norms, social aptitude). These programs have been implemented and evaluated in community settings (77), schools (78), clinical venues (79), and locations such as prisons (80,81), detention centers (82), and inpatient substance
abuse treatment facilities (83). Several reviews have reported on the effects of STI/HIV interventions for adolescents (79,84—87).

Regardless of the intervention venue (schools, clinics, incarceration/treatment facilities, community settings), some degree of positive behavioral change as a result of participation in the intervention is typically observed (85). The most frequently reported behavioral outcome is the reduction in frequency of unprotected sexual intercourse or increased condom use (87). Less common, however, are intervention effects that result in a delay in initiation of intercourse (88—90), a decrease in the frequency of intercourse (83,90—93), or a reduction in the number of sexual partners (80,94).

Given these inconsistent results of intervention trials, we have two important questions: Why are some interventions more effective than others? Why do certain programs have a greater likelihood of success across behavioral domains? A number of key findings have suggested that interventions with more success decreasing high-risk sexual behavior are those that are specifically tailored and delivered to a particular subgroup of adolescents (e.g., African-American females) (92,95—97). Various researchers have supported and advocated for a tailored approach for STI/HIV risk-reduction interventions, arguing that these interventions have the greatest probability of being successful (98,99).

The use of a theoretical framework to guide intervention development and implementation has also been associated with improved STI/HIV risk-reduction outcomes. Social Learning Theory and Social Cognitive Theory are the frameworks most consistently used in successful programs (90—92, 96,97,100—103). These programs often incorporate modeling through activities, such as role-play, that help adolescents recognize stimuli that trigger unsafe behaviors, facilitated condom demonstrations designed to enhance condom application skills, and techniques for effective partner communication and negotiation in an attempt to increase self-efficacy with regard to safer sexual behavior (90—92).

Additionally, interventions that enhance adolescents’ self-concept and self-esteem as well as social competency skills may be effective for the prevention of STI/HIV-associated risk behaviors. Programs that include broader-based content, such as problem-solving, capacity building, social skill building, and enhanced gender and ethnic pride, have been shown to affect behavior (90,92,96,100,101,104). For example, HIV-protective behavior has been shown to increase among African-American females after participation in programs that include activities highlighting fundamental social processes relevant to their own life (105). Specifically, through the examination of poetry written by African-American women, discussion of the challenges and joys of being African-American females, exposure to artwork from African-American women, identifying African-American role models, and prioritizing their personal values, adolescents have become empowered to raise their expectations of what it is to be a woman cognizant of her sexuality (92). Other activities, such as emphasizing the importance of completing their education, developing career goals, and writing effective professional resumés, have also been incorporated in adolescent STI/HIV prevention programs (97). Summarizing this approach, Robin and colleagues noted, “Interventions more generally targeted toward increasing resiliency and competencies are emerging as promising approaches to reducing sexual risk behavior” (86).

What remains unclear is the relationship between intervention duration and intervention efficacy. Some evidence has suggested interventions with few sessions (less time-intensive) are as effective at reducing risk behaviors as interventions with many sessions (more time-intensive) (77). In contrast, another review indicated that longer intervention duration may positively influence the adoption of health-protective behavior changes (86). At present, the only clear relationship between duration and reduction of sexual risk behavior has been observed among clinic-based studies that were time-intensive, multisession interventions (87,90,92). To optimize the development and evaluation of future STI/HIV prevention interventions for adolescents, we propose potential improvements with regard to intervention design and implementation.

Clinical and Policy Implications for Practice: Improving Future STI/HIV Prevention Efforts for Adolescents

Tailor Interventions to the Needs of the Population

Tailored interventions are generally more effective relative to general or broad-based interventions in terms of reducing STI/HIV-associated behaviors. Tailored interventions explicitly acknowledge that adolescents are not a homogeneous population; rather, adolescents are a heterogeneous mosaic of subgroups of different ethnicities/cultures, behavioral risk characteristics, developmental levels, sexual preferences, and gender differences. Distinctively, SIHLE (Sistas Informing, Healing, Living and Empowering) is one successful model of a theory-guided, culturally appropriate, and gender-tailored sexual risk-reduction program for African-American female adolescents (92). Social Cognitive Theory and the Theory of Gender and Power guided the design and implementation of the SIHLE intervention (20,106). Social Cognitive Theory addressed both the psychosocial dynamics facilitating health behavior and the methods of promoting behavior change. Applying the gender-relevant theoretical framework of the Theory of Gender and Power was critical as it highlighted HIV-related social processes prevalent in the lives of African-American female adolescents, such as having older male sex partners, having violent dating partners, being stereotyped by the media, perceiving society as having limited regard for African-American teens, engaging in serial monogamy, experiencing peer pressure, and communicating nonassertively about safer sex. Ultimately, by creating an intervention for adolescent females grounded in both Social Cognitive Theory and the Theory of Gender and Power, the processes that specifically impede young women’s adoption of risk-promoting behaviors could be addressed, at the same time teaching them multidimensional strategies to protect themselves from
acquiring STIs and HIV. SiHLE intervention sessions were designed to be engaging through the use of interactive games, music, role-plays, and open discussions. Additionally, the thematic focus of the intervention, "Stay Safe for Yourself, Your Family, and Your Community," was designed to promote a sense of solidarity and ethnic pride among participants.

Unlike many HIV/sexually transmitted disease prevention interventions that focus only on cognitive decision-making and social and technical competency skills, SiHLE also focused on developing relational skills, amplifying intrinsic motivation (altruism, pride, self-esteem, perceived value, and importance in the community), and mobilizing extrinsic motivators (peer normative influences from the group) to create an environment that enhanced adolescents' likelihood of adopting and sustaining preventive behaviors after participation in the intervention. Because of the myriad differences between adolescent subgroups, developing interventions specifically for a restricted subgroup of adolescents may produce optimal results in terms of reducing risk-associated behavior. Thus, acknowledging that adolescents are not a homogeneous group is a critical first step in providing an impetus to design tailored interventions (107).

**Target Those Behaviors That Are Most Amenable to Change**

Future interventions with adolescents, especially adolescents who are sexually active, should target behaviors like condom use that have been empirically demonstrated across a variety of adolescent subgroups and venues to be amenable to change. Incorporating a focused approach and targeting only specific areas of behavioral change—those that are both reasonable and feasible for adolescents to accomplish—could result in a prevention strategy that amplifies STI/HIV program efficacy and lays the foundation for more sustainable program effects over time. For example, the aforementioned intervention—SiHLE—was able to significantly increase condom use and at the same time markedly reduce the number of incident Chlamydia infections by targeting condom skills, frequency of condom use, and partner communication techniques (92).

**Expand the Scope of STI/HIV Intervention Programs Beyond the Individual**

Contemporary thinking in public health practice has shifted focus from the adolescent alone to the adolescent embedded in a complex ecology of peer, relational, familial, and cultural factors that constantly shape their STI/HIV-associated risk and protective behaviors (15,106,108). It is possible that the next generation of STI/HIV risk-reduction interventions will be developed, using a multitier intervention framework. Such an intervention would be designed to extend, reinforce, and amplify the preventive message initially delivered to the adolescent using group-formatted or social network intervention strategies that create an atmosphere conducive to and supportive of adolescents’ adoption and maintenance of STI/HIV-preventive practices.

At present, we are engaged in a multisite trial (Project IMPPACS) that targets African-American adolescents and is designed to assess the relative efficacy of an evidence-based face-to-face risk-reduction intervention in terms of both initial behavior change and sustained behavior change over an 18-month follow-up period. This trial is unique because it contains three study conditions: a small-group safer sex intervention paired with a mass media campaign, a small-group safer sex intervention alone, and a control condition. The underlying assumption is that targeting adolescents through multiple channels or levels of intervention may have a synergistic effect on STI/HIV preventive behaviors that exceeds that of a single channel or level. From this perspective, adolescents’ STI/HIV risk behavior should not be conceptualized as “individual deficits” but rather more appropriately and favorably viewed as a reflection of their relational, familial, community, and societal environments (109–111).

**Utilize the Family as a Behavioral Change Agent**

Given the central role the family plays in many developmental processes, utilizing adolescents’ family as a behavioral change agent could be particularly beneficial. Involving parents may be an especially important strategy to help delay adolescents’ sexual debut, reduce frequency of intercourse, limit the number of sexual partners, or support health promoting behaviors such as protected sex. These goals may be achieved by fostering improved communication between parents and adolescents and intensified parental monitoring (44,112).

We are currently collaborating on a multisite trial (Project STYLE) designed to evaluate the efficacy of a parent-adolescent intervention relative to an adolescent-only intervention and a control condition in enhancing STI/HIV-preventive behaviors. Again, the key assumption underlying this approach is that multilevel interventions may yield greater efficacy and sustainability of effects.

**Incorporate Long-Term Maintenance Strategies Into Interventions**

For behavior change to be meaningful, it must be durable. Given the scope and complexity of influences that can affect adolescents’ sexual behavior, it is unclear whether short-term STI/HIV preventive changes, observed as a result of participating in a risk-reduction program, can be sustained over protracted periods of time. Thus, it is necessary to develop and incorporate innovative prevention maintenance strategies to sustain, and if possible, amplify STI program efficacy. For example, we described two multilevel interventions that may enhance sustainability by intervening with adolescents’ family and targeting media exposures designed to reinforce prevention messages.

**Incorporate Biological Outcomes as a Measure of Program Efficacy**

Historically, interventions have relied almost exclusively on adolescents’ self-reported behavior change to assess pro-
gram efficacy. Self-reported data have been criticized as subject to potential reporting biases, inaccurate recall, and social desirability bias (113,114). Recently, the use of newly developed deoxyribonucleic acid assays (polymerase chain reaction) to detect prevalent STIs has been advocated as a complementary measure for evaluating program efficacy. Thus, future STI intervention studies, when applicable and feasible, should consider the usefulness of including biological markers as an objective and quantifiable outcome measure of program efficacy.

Translate and Disseminate Effective STI/ HIV Interventions

It is unlikely that any single STI/HIV intervention would be appropriate and equally effective for all adolescents given the heterogeneous nature of this population. The true challenge concerns moving beyond the rigorous Phase III efficacy study and taking the necessary steps toward translating those interventions that have demonstrated programmatic efficacy in a particular venue (87), and with a particular group (92), into sustainable programs that can be disseminated widely among similar venues and populations. Ultimately, preventing STI/HIV infection in adolescents does not only depend on the development and evaluation of innovative behavior change approaches but also on how effectively these interventions can be translated and integrated into self-sustaining components of clinic practice, school curricula, or community programs, particularly among populations most adversely affected by disease transmission (115). One approach that has been employed in recent years is the Dissemination of Evidenced-Based Interventions (DEBI) Program at the Centers for Disease Control and Prevention. This is a three-phase process where evidence-based interventions are identified, packaged in a user-friendly format, and disseminated nationally to HIV prevention providers.

CONCLUSIONS

If we are to address the challenge of STI/HIV prevention among adolescents, programs targeting psychosocial antecedents of risk behavior will play a major role. New and more innovative intervention approaches will continue to evolve, encompassing principles of adolescent development and being responsive to changes in the social and biological factors that have substantial influence on adolescents’ health behavior. However, optimizing STI/HIV prevention efforts in the future will require prioritizing the development and evaluation of innovative, theory-based, empirically driven, and rigorously designed research tailored to the cultural, gender, and sociodemographic characteristics of the target population (116,117).

REFERENCES


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RISK BEHAVIOR AND HIV PREVENTION EFFICACY


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