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The impact of youth, family, peer and neighborhood risk factors on developmental trajectories of risk involvement from early through middle adolescence

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A B S T R A C T

Few studies have analyzed the development course beginning in pre-/early adolescence of overall engagement in health-risk behaviors and associated social risk factors that place individuals in different health-risk trajectories through mid-adolescence. The current longitudinal study identified 1276 adolescents in grade six and followed them for three years to investigate their developmental trajectories of risk behaviors and to examine the association of personal and social risk factors with each trajectory. Group-based trajectory modeling was applied to identify distinctive trajectory patterns of risk behaviors. Multivariate multinomial logistic regression analyses were performed to examine the effects of the personal and social risk factors on adolescents' trajectories. Three gender-specific behavioral trajectories were identified for males (55.3% low-risk, 37.6% moderate-risk, increasing, and 7.1% high-risk, increasing) and females (41.4% no-risk, 53.4% low-risk, increasing and 5.2% moderate to high-risk, increasing). Sensation-seeking, family, peer, and neighborhood factors at baseline predicted following the moderate-risk, increasing trajectory and the high-risk, increasing trajectory in males; these risk factors predicted following the moderate to high-risk, increasing trajectory in females. The presence of all three social risk factors (high-risk neighborhood, high-risk peers and low parental monitoring) had a dramatic impact on increased probability of being in a high-risk trajectory group. These findings highlight the developmental significance of early personal and social risk factors on subsequent risk behaviors in early to middle adolescence. Future adolescent health behavior promotion interventions might consider offering additional prevention resources to pre- and early adolescent youth who are exposed to multiple contextual risk factors (even in the absence of risk behaviors) or youth who are early-starters of delinquency and substance use behaviors in early adolescence.

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Introduction

A substantial literature has documented an increase of health-risk behaviors (i.e., delinquency, substance use, unsafe sexual behavior) during adolescence (Connell, Gilreath, & Hansen, 2009; Huang, Lanza, Murphy, & Hser, 2012; McMorris, Hemphill, Toumbourou, Catalano, & Patton, 2007). This increase has been attributed to dramatic biological, cognitive, and social changes associated with this developmental period (Steinberg, 2008). The increases in sensation-seeking in early adolescence combined with immature cognitive control abilities have been postulated to play a primary role in adolescent health-risk behaviors (Steinberg, 2004). As a result of these developmental changes, adolescents frequently engage in multiple risk behaviors which have the potential to result in long-lasting negative health outcomes, including HIV infection and other sexually transmitted infections (Green & Ensminger, 2006; Millstein & Moscicki, 1995). Numerous educational programs, typically school-based, have been developed to reduce adolescent health-risk behaviors. However, systematic research on health education delivered to adolescents indicates that even the best programs have had modest success in altering adolescent engagement in unsafe practices (Steinberg, 2004).

Determination of distinctive trajectories of risk behaviors in adolescence and associated risk factors (i.e. factors associated with negative behaviors) may help in identifying subgroups of youth

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who are at greater risk and inform future prevention efforts. In the past decade, a growing number of studies have examined developmental trajectories among adolescents and young adults of specific unhealthy behaviors and risk factors that are associated with these trajectories; behaviors examined include alcohol use (Danielsson, Wennberg, Tengström, & Romelsjö, 2010), delinquency (Miller, Malone, Dodge, & Conduct Problems Prevention Research Group, 2010), cigarette smoking (Tucker, Ellickson, Orlando, & Klein, 2006), marijuana use (Brook, Lee, Brown, Finch, & Brook, 2011), and unsafe sexual behavior (Fergus, Zimmerman, & Caldwell, 2007; Huang, Murphy, & Hser, 2012). These studies demonstrated that practising these potentially unhealthy behaviors tends to follow a limited number of distinct developmental pathways of specific behavior in adolescence. For example, using data from the 1997 National Longitudinal Survey of Youth, Huang, Murphy, et al. (2012) identified five trajectories of unsafe sexual behavior from adolescence to young adulthood (including high-risk, decreased risk, increased-early, increased-late, and low-risk groups). Danielsson et al. (2010) described four developmental pathways of alcohol drinking in adolescence (including low, gradually increasing, high, and suddenly increasing consumption) among a cohort of high school students in Stockholm, Sweden. Tucker et al. (2006) identified six smoking trajectory groups among women from adolescence to young adulthood (stable highs, early increasers, late increasers, triers, decreasers, and abstainers) and found that women with certain patterns of smoking (stable highs and early increasers) are at increased risk for early sexual activities. All of the above-mentioned longitudinal studies except for the study conducted by Miller et al. (2010) investigating the developmental trajectories of risk behavior identified youth in their mid-adolescence (at age 14 or 15 years) and followed them until late adolescence or young adulthood (age 19–25 years). It is probable that many of these youth were already involved in unhealthy behavior at the inception of prior studies. There is a lack of empirical research into the developmental course of risk engagement in early adolescent. Furthermore, as risk behaviors in adolescence are highly interrelated (Palen, Smith, Flisher, Caldwell, & Mpofu, 2006; Tu, Lou, Gao, Li, & Zabin, 2012), it may be more informative to investigate the developmental course of overall risk behaviors in adolescence from a preventive perspective. Therefore, our study extends the work of the previous studies by examining the trajectories of overall health-risk behaviors from early through middle adolescence.

Multiple factors have been identified which increase or decrease the likelihood of young people performing health-risk behaviors. High sensation-seeking has been found to be associated with a range of unhealthy behaviors including delinquency (Harden, Quinn, & Tucker-Drob, 2012), drug use (Kong et al., 2013), smoking (Hampson, Tildesley, Andrews, Barckley, & Peterson, 2013), alcohol use (Wilkinson, Shete, Spitz, & Swann, 2011), and unsafe sexual behaviors (Charnigo et al., 2013). Adolescent behavior is highly influenced by social factors such as parents and peers (Steinberg, 2004). Effective parental monitoring has been shown to reduce problem behavior among adolescents, including early sexual initiation, smoking and marijuana use, and unsafe sexual behavior (Coley, Votruba-Drzal, & Schindler, 2009; Stanton et al., 2004). Conversely, low levels of parental monitoring have been associated with increased levels of delinquent behavior, smoking, alcohol and drug use, and unsafe sexual practices (Caldwell, Beutler, Ross, & Silver, 2006; Dick et al., 2007; DiClemente et al., 2001). Parental monitoring is thought to mitigate adolescent unsafe behavior by limiting opportunities for adolescents to engage in these behaviors (including exposure to peers who engage in these practices) and creating an environment in which there is pressure for adolescents to comply with parental expectations (Sieverding, Adler, Witt, & Ellen, 2005). Perceptions of peers' unhealthy behaviors increase the likelihood that an adolescent will engage in similar activities (Arnett, 2007). For example, adolescents who perceive their friends to be using alcohol/drugs and having sex will engage in these behaviors more frequently than those who do not perceive their friends to be doing so (Aseltine, 1995; Romer & Stanton, 2003). Studies also found that, beyond family and peer contexts, social settings such as neighborhoods play an important role in unhealthy behaviors. Adolescents' perceptions of neighborhood disorganization such as violence and drug activity were associated with increased alcohol, tobacco and marijuana use (Lambert, Brown, Phillips, & Ialongo, 2004; Wilson, Syme, Boyce, Battistich, & Selvin, 2005), and early initiation of sexual activities for boy (Upchurch, Aneshensel, Sucoff, & Levy-Storms, 1999). Despite the abundant literature on adolescent health-risk behavior and contextual factors, we know relatively little about the combined impact of earlier youth, family, peer and neighborhood risk factors (e.g. during pre-adolescence) on the subsequent adolescent developmental course of unhealthy behaviors.

Accordingly, this study uses four waves of data from a longitudinal study to investigate the developmental trajectories of risk behaviors (i.e., reports of enacting health-risk behaviors regarding delinquent/aggressive behavior, substance use and unsafe sex) and associated contextual risk factors that put pre- and early-adolescents at elevated likelihood to follow the high-risk trajectories. The goals of the current study were threefold. First, we sought to explore whether there are multiple trajectory patterns of risk behaviors among Bahamian adolescents from pre-/early through middle adolescence. Second, if such trajectories exist, we sought to describe growth patterns of specific risk behaviors for those who follow the high-risk trajectory. Finally, we examined the impact of different combinations of social/contextual risk factors on the probability of being in high-risk trajectory group.

Methods

Study site

The data was collected as part of a school-based, HIV prevention program in The Bahamas. The Bahamas was selected for the study because of its relatively high adult HIV prevalence rate (2.8%) in the Caribbean (UNAIDS, 2012). Fifteen government elementary schools (from among a total of 26 schools) on the main island of The Bahamas (New Providence) participated in this study. New Providence was selected as the study site because it is home to 65% of the nation's population, including an estimated 86% of those infected with HIV (Bahamian Ministry of Health, 2006). The youth in this sample represented approximately two-thirds of all youth in the 15 participating schools.

Participants

The study was carried out from September 2004 to December 2008 in 15 government elementary schools in The Bahamas. The original study was a three-arm HIV prevention intervention that included an attention control condition that was an environmental conservation course and two variations of an HIV adolescent risk reduction intervention. A detailed description of the intervention and control conditions can be found in our prior publications (Chen et al. 2009; Gong et al. 2009). The full cohort of youth was followed longitudinally for three years with follow-up rates of 95% at 12 months, 92% at 24 months, and 87% at 36 months post-intervention. This longitudinal study affords an excellent opportunity to study developmental trajectories of early risk involvement. The results from these follow-ups showed that the

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