Maternal HIV, Substance Use Role Modeling, and Adolescent Girls' Alcohol Use

Julie A. Cederbaum, PhD, MSW, MPH
Erick G. Guerrero, PhD
Anamika Barman-Adhikari, PhD, MSW
Carol A. Vincent, PhD, RN, CRNP

Parental role modeling has a major influence on adolescent alcohol use. Our study examined maternal factors associated with daughters' alcohol use among inner-city racial minority adolescents of HIV-infected and HIV-uninfected mothers. A nonprobability sample of 176 mothers (37% with HIV) and their adolescent daughters completed self-administered surveys. Between- and within-group analyses were conducted using hierarchical multivariate logistic regressions. Findings showed that in the full sample, difficulty talking with daughters about alcohol was positively associated with alcohol use among daughters, whereas maternal report of importance of religion was negatively associated with alcohol use among daughters. Within-group analysis of participants by maternal HIV status revealed that maternal beliefs that drinking alcohol in front of their daughters was normative were associated with higher odds of adolescent alcohol use in households with HIV-infected mothers. These preliminary findings highlight the potential increased vulnerability of racial minority adolescent girls living in households with HIV-infected mothers.

Adolescent use of alcohol and other drugs is a leading public health issue in the United States; of particular concern are increasing rates of substance use among girls (Schinke, Fang, & Cole, 2009). By the 12th grade, most adolescents have tried alcohol at least once. Nationwide, 70.8% of adolescents reported having consumed alcohol, with 38.7% consuming alcohol during the previous 30 days (Centers for Disease Control and Prevention, 2012). Among eighth and tenth graders, girls drank more, were more likely to start using substances at younger ages, and were more likely to become dependent on substances relative to boys (Schinke et al., 2009). While rates of drinking by sex are well studied, less work has focused specifically on teenage girls (Dauber, Hogue, Paulson, & Leiferman, 2009). What is known is that once girls start abusing substances, they are more likely to become dependent,

Julie A. Cederbaum, PhD, MSW, MPH, is an Assistant Professor, School of Social Work, University of Southern California, Los Angeles, California, USA. Erick G. Guerrero, PhD, is an Assistant Professor, School of Social Work, University of Southern California, Los Angeles, California, USA. Anamika Barman-Adhikari, PhD, MSW, is an Assistant Professor, School of Social Work, University of Denver, Denver, Colorado, USA. Carol A. Vincent, PhD, RN, CRNP, is a Nurse Practitioner at The Children's Hospital of Philadelphia and an Adjunct Assistant Professor at the University of Pennsylvania School of Nursing, Philadelphia, Pennsylvania, USA.

making alcohol use initiation and use among girls important to understand. Furthermore, alcohol use by girls is associated with risky sexual behavior, including unintended pregnancy, mental health problems, accidents, and delinquency (Dauber et al., 2009; Schinke et al., 2009).

Although there are common precipitators of adolescent alcohol use for both boys and girls, parental role modeling regarding alcohol and drugs has been shown to be more salient for girls than boys (Choquet, Hassler, Morin, Falissard, & Chau, 2008). Furthermore, maternal influence on adolescent substance use behaviors seems to be more significant than paternal influence (Schinke et al., 2009); this is likely attributable to the difference in parent-child relationships and roles (Killoren, Updegraff, Christopher, & Umaña-Taylor, 2011). However, maternal health (e.g., HIV serostatus) may influence this relationship. Children of an HIV-infected parent may take on the role of caregiver (Keigher, Zabler, Robinson, Fernandez, & Stevens, 2005), and stressors related to this role shift may influence engagement in alcohol use behaviors (Mellins, Brackis-Cott, Dolezal, & Meyer-Bahlburg, 2005). Structured routines related to household management (e.g., roles and duties) and family engagement (e.g., family meals together) in HIV-infected families may mitigate engagement in risk behaviors by youth (Murphy, Marelich, Herbeck, & Payne, 2009).

It has been well established that maternal role-modeling behaviors influence children's beliefs and behaviors, particularly in stressful environments. Maternal communication about risk behaviors is also critically important, especially for children living in high-stress environments, which increase exposure and access to drugs (Miller-Day, 2002). Qualities influencing these parenting behaviors continue to be elucidated. It is important to explore the association between maternal risk and protective factors and daughters' alcohol use in inner-city environments, especially among daughters facing the added stressors of having an HIV-infected parent. In this work, we explore, among both HIV-infected and HIV-uninfected mothers, maternal role modeling and its influence on the alcohol behaviors of Black and Hispanic adolescent girls.

Background

Maternal Alcohol Use Role Modeling and Daughters' Alcohol Use

The extant literature has demonstrated the powerful influence of parental substance use on the substance abuse of girls. Consistent with social learning theory (Bandura, 1977), parents serve as behavioral role models, with youths likely to mimic both positive and negative parental behavior (e.g., if parents drink, their children are more likely to drink; Latendresse et al., 2008). In a meta-analysis, delayed alcohol initiation and reduced levels of later drinking were predicted by a number of factors, including parental role modeling of alcohol use (Brook, Balka, et al., 2010; Mares, Van Der Vorst, Engels, & Lichtwarck-Aschoff, 2011). Negative adult influence on substance use behaviors has been found for Black youth (Brook, Balka, et al., 2010). Specifically, research suggests that the effect of alcohol-specific role-modeling behaviors might vary as a function of the parent–child gender; however, these findings have been mixed (Coffelt et al., 2006). For example, McGue, Iacono, Legrand, and Elkins (2001), along with their finding that early use of alcohol by mothers was associated with a significant increase in the risk of alcohol use by sons and daughters by age 14 years, noted that while genetic factors seem to have a strong effect on whether boys engage in early alcohol use, environmental factors seem to be more pertinent in understanding early alcohol use among girls. However, other studies (Zhang, Welte, & Wieczorek, 1999) found no such effects. The inconsistent findings have been attributed to reliance of clinical samples and insufficient studies focusing on larger samples of women (Coffelt et al., 2006). Researchers have, therefore, called for additional research incorporating community samples of women in order to clarify these inconsistent findings.

Maternal Communication About Alcohol and Daughters' Alcohol Use

Beyond the modeling of behaviors (Latendresse et al., 2008), parents also influence their children's behaviors by communicating expectations about

alcohol use. However, parents often report not talking or having difficulty talking to their children about alcohol-related issues (Van Der Vorst, Engels, Meeus, Deković, & Van Leeuwe, 2005). Furthermore, if parents drink, the likelihood that such communication will take place is further reduced (Van Der Vorst, Burk, & Engels, 2010). Parents have been found to communicate differently with daughters and sons, which may be due, in part, to the misperception that adolescent girls do not drink as much as boys (Van Der Vorst et al., 2010). This is concerning because of the known influence of family, above peers and structural factors, on the substance abuse of adolescent girls (Schinke et al., 2009). The effectiveness of such communication also depends on with whom a child interacts in the family environment. Mothers tend to be much more conversant about a wide variety of issues, especially sensitive issues such as sex and drug use (Miller-Day, 2002). Furthermore, daughters also typically report greater comfort and frequency of discussions about sensitive topics with their mothers (Kapungu et al., 2010). In general, studies have found that maternal communication is effective in preventing adolescent risk behaviors, especially among girls (Schinke et al., 2009). Although extensive research has explored the role of parental sexual risk communication on adolescent sex risk behaviors, the association between alcohol-specific parental communication and adolescent alcohol use has not been well investigated (Van Der Vorst et al., 2010).

Maternal HIV Status and Daughters' Alcohol Use

Adolescents face many challenges when living in high-risk family environments; parental HIV poses unique challenges in terms of a parent's physical symptoms, adult and adolescent depression, and familial issues related to HIV disclosure (Murphy, Marelich, Armistead, Herbeck, & Payne, 2010). More importantly, emerging evidence suggests that girls are more likely than boys to react to disruptions in their home environments, which might include a chronically ill mother (Davies & Lindsay, 2004). While Black adolescent girls are more likely to abstain or experiment with alcohol (Dauber et al., 2009), adolescents in families experiencing the stress of a chronic illness (e.g., HIV infection) are more likely to report increased alcohol use (Brook, Brook, Rubenstone, Zhang, & Finch, 2010). For example, a study conducted with 205 African American mothers and children residing in a low-income, inner-city environment and facing socioeconomic constraints, found that HIV-infected mothers and their children reported receiving lower levels of emotional support relative to families without an HIV-infected parent (Klein et al., 2000). Similarly, other studies that sampled both HIV-infected and HIV-uninfected mothers from similar socioeconomic backgrounds typically found that adolescents whose mothers had HIV reported higher rates of destructive coping, poor psychological health, and academic issues compared to adolescents who did not have mothers living with HIV (Forehand et al., 2002). Adolescents living with parents who are in poor physical or psychological health exhibit more depression and anxiety (Murphy, Austin, & Greenwell, 2006), factors that are associated with alcohol use. Further, youth with HIV-infected mothers are more likely to report externalizing behaviors (Tompkins & Wyatt, 2008), particularly when monitoring is low (Murphy et al., 2009). Yet findings related to the mental health of children with HIV-infected mothers have varied. Although some studies found no differences in depressive symptoms in this population compared to peers (Brackis-Cott, Mellins, Dolezal, & Spiegel, 2007), others have reported higher rates of depressive symptoms and increased engagement in risky behaviors such as alcohol use, generally viewed as a method of coping (Lester et al., 2006). This has led to calls for further research to identify mechanisms that might explicate the relationship between maternal HIV infection and problem behaviors displayed by their children.

Additionally, similar to other stigmatized chronic conditions, HIV influences family dynamics, including intra-familial roles. Family roles can undergo frequent changes as parental abilities to perform certain functions fluctuate (Rotheram-Borus, Flannery, Rice, & Lester, 2005), leading to a configuration that compensates for and responds to a family member's illness. These role changes may weaken the parent–child relationship, which is a known correlate of adolescent risk engagement (Rotheram-Borus et al., 2005). Having an HIV-infected parent has been found to increase the risk

of substance use among children (Brook, Brook, et al., 2010). Although this finding has not been consistent across studies (Elkington, Bauermeister, Brackis-Cott, Dolezal, & Mellins, 2009), parenting challenges have been associated with increased externalizing behaviors in children, including substance use (Knowlton, Buchanan, Wissow, Pilowsky, & Latkin, 2008). Maternal bonds have been found to mediate the relationship between level of maternal illness and binge drinking, among other negative behaviors (Lester et al., 2010; Murphy et al., 2009), and parental health lapses have been found to further exacerbate substance use, peer issues, and emotional distress (Lester et al., 2010).

Maternal Religiosity and Daughters' Alcohol Use

Parental religiosity has emerged as a protective factor that reduces high-risk behavior among adolescents (Sinha, Cnaan, & Gelles, 2007). For example, although adolescents may actively reject parental belief systems (Abar, Carter, & Winsler, 2009), values such as religiosity represent a form of conventional socialization and instill conservative attitudes that may protect adolescents from engaging in drinking behaviors (Jang, Bader, & Johnson, 2008). Specifically, studies have shown that the effects of religiosity are more prominent among women (Wills, Yaeger, & Sandy, 2003). Self-reported religiosity among adolescents has been linked to decreased engagement in alcohol use (Vidourek & King, 2010). These attitudes are often derived from family values and practices (Blake, Simkin, Ledsky, Perkins, & Calabrese, 2001). Parental communication about familial belief systems provides a framework with which children can understand these expectations; religion can be used to socialize children, facilitating adoption of protective norms (Baier & Wright, 2001). Religion may be particularly important for African American families and families with an HIV-infected parent (Cotton et al., 2006), which have been found to participate in religious activities at greater rates than other groups (Sinha et al., 2007).

Conceptual Approach

Dealing with a chronic illness such as HIV can impair parenting effectiveness due to illness-related stressors (Mellins et al., 2007). For example, the gender intensification hypothesis posits that because girls become more communal by early adolescence, they are more vulnerable to any disruption in the family environment (Coffelt et al., 2006). However, other parental influence factors such as parent–child communication about alcohol may mitigate the effect of such stressors on adolescent alcohol use (Brody et al., 2004), even when individual characteristics of adolescents play a significant role in alcohol initiation and use. This is most significant for girls, who, even prior to initiation, often believe that alcohol will help them cope with distress and negative mood (Johnson & Johnson, 1998). Once girls initiate use, they often continue to consume alcohol to allay problems or elevate mood (Donovan, 2004). To better understand how gender-specific qualities and maternal HIV status influence adolescent alcohol use, we examined whether maternal alcohol use, communication about alcohol, and investment in religious activities were associated with daughters' alcohol use.

Because religiosity may play a protective role in reducing high-risk behaviors among adolescents, particularly for African American families (Sinha et al., 2007), we expected that maternal report of the importance of religion and attendance at religious services (religiosity) would be associated with a decreased likelihood of alcohol use as reported by daughters. Many families with HIV-infected members experience alcohol and drug-abuse issues (Rotheram-Borus, Rice, Comulada, Best, & Li, 2012). Although it is unclear whether HIV infection, a history of substance use, or other environmental factors increase the risk of alcohol and drug use, research has suggested that this risk may be higher among adolescents living with an HIV-infected parent, particularly when they are aware of their parents' HIV serostatus (Brook, Brook, et al., 2010).

Hence, our goal was to explore between- and within-group differences. In other words, we tested the moderating role of HIV status in the relationship between maternal alcohol-related role-modeling behaviors (using alcohol during the previous 30 days, importance of not drinking alcohol in front of daughters, and difficulty communicating with daughters about alcohol use) and daughters' alcohol use, in addition to differences within HIV status groups regarding daughters' alcohol use. By understanding

contextual factors associated with HIV-infected mothers that predispose daughters from low-income, inner-city environments to engage in alcohol use, family interventions can be developed to reduce the risk of alcohol experimentation, use, and abuse in this vulnerable adolescent population.

Method

Sample and Procedures

A nonprobability sample of 176 mother–daughter dyads was recruited between July 2008 and June 2009 from 11 community service organizations in Philadelphia, PA; Newark, NJ; and New York, NY; in the United States. Data were collected as part of a larger study examining parental influence behaviors and adolescent sexual risk engagement by maternal HIV status. Inclusion criteria for adults were: (a) a self-reported diagnosis of HIV, AIDS, or HIV-uninfected status; (b) Black or Hispanic; (c) co-residence at least 50% of the time with an HIV-uninfected daughter between the ages of 14 and 18 years who was aware of maternal HIV status; and (d) English language proficiency. If the mother reported multiple daughters within the inclusion age range, the daughter closest (in months) to age 16 years was selected to participate. This was done to reduce parental bias (e.g., picking the daughter the participant might think would give the most socially desirable answers or with whom she had a "better" relationship). All participants resided in nearby urban or inner-city communities. Participation required signed written consent from adults for themselves and their daughters, and written consent from daughters ages 18 or written assent from daughters ages 14–17 years. Mothers received $20 and daughters received $15 for their participation.

The sample included 65 (37%) women with an HIV diagnosis. The average age of mothers was 40.89 years (range 27–70 years; $SD = 7.13$). Most of the sample self-identified as Black (86.3%); the remaining participants identified as Hispanic. Nearly two thirds of the mothers were high school graduates; 47% were employed. Mothers without HIV were significantly more likely than HIV-infected mothers to self-identify as Black (91.6% vs. 76.7%, respec-

tively), have completed high school (70.6% vs. 53.1%), report being employed (54.1% vs. 36.9%), and report that their child's other parent was involved in parenting (72.5% vs. 54.7%). There were no differences in maternal use of alcohol.

Survey data were collected using standardized instruments previously validated with inner-city adult and adolescent populations (O'Leary, Jemmott, & Jemmott, 2008). These scales and single-item measures were used to capture individual characteristics and family environment attributes. Each mother and daughter completed questionnaires individually; this was done separately but simultaneously. Surveys were completed either at the recruitment site or in participants' homes. Mothers reported on their own alcohol use, importance of religion, attendance at religious services, and difficulty talking with daughters about alcohol. Daughters reported on their age, depressive symptoms, and alcohol use during the previous 30 days. To increase the validity of self-reported information, anchors were used to help respondents recall a reasonably brief period (3 months). The institutional review boards at the University of Southern California and Boston College approved all procedures.

Measures

Dependent variable. Our main outcome was daughters' alcohol use during the previous 30 days. This single item was measured by asking, *In the past 30 days, on how many days have you used alcohol?* Response choices were 0 = *I have never drank alcohol*, 1 = *I did not drink alcohol in the past 30 days*, or 2 = *I did drink alcohol in the past 30 days*. If answer 2 was given (*yes in last 30 days*), then a follow-up question was asked, *On how many days (in the last 30 days) did you drink alcohol?* Given the skewness (for those who wrote in a specific number of days), we transformed this measure to a dichotomous variable (*yes* or *no*) as suggested in other studies (DeCoster, Iselin, & Gallucci, 2009). Although limited as a dichotomous measure, this single item adequately represented the construct of alcohol use in other studies that specified a time frame (Metzger, Navaline, & Woody, 2001).

Independent variables. Maternal HIV status was measured with a single item: *Are you HIV positive?*

Maternal alcohol use during the previous 30 days mirrored the question answered by daughters. Maternal communication about alcohol use was measured with one question: *How difficult is it to talk to your daughter about not using alcohol?* Answers were measured on a 5-point Likert scale ranging from *very easy* to *very hard*. We used mothers' reports (as opposed to daughters') because all other measures in these analyses were asked of mothers and there were no significant differences between mothers' and daughters' reports ($p < .166$). Religiosity-related questions were: (a) *How important is religion to you?* ($1 = not\ important$, $2 = somewhat\ important$, or $3 = very\ important$) and (b) *How often do you attend religious services?* ($1 = never$ to $5 = once\ a\ week\ or\ more$). Maternal beliefs regarding the importance of not drinking in front of daughters were measured using one item: *It does not matter if I drink alcohol in front of my daughter*; responses were measured on a 5-point Likert scale ($1 = agree\ strongly$ to $5 = disagree\ strongly$). Two interaction terms were created using dichotomous measures of maternal alcohol-related behaviors (using alcohol during the previous 30 days and not drinking in front of daughter) and maternal HIV status. The measure of maternal alcohol use in front of daughters was dichotomized due to skewness. These interactions were tested in the full sample regression model. See descriptive data in Table 1.

Table 1. Means, Percentage, Standard Deviations, and Ranges ($N = 176$)

Variable	M or %	SD	Range
Daughter used alcohol during previous 30 days[a]	28.01		
Daughter age	15.80	1.54	13–19
Daughter depressive symptoms	7.62	5.55	0–24
Mother has HIV	37.01[a]		
Mother used alcohol during previous 30 days	27.01[a]		
Maternal report of importance of not drinking in front of daughter	3.98	1.25	1–5
Maternal report of importance of religion	2.74	0.57	1–3
Maternal attendance at religious services	3.28	1.41	1–5
Maternal difficulty talking to daughter about alcohol	4.31	0.90	1–5

a. Reported as percentage.

Along with daughters' ages (measured in years at time of survey), we also chose to control for girls' depressive symptoms. Depressive symptoms were controlled for because of the association between alcohol use and mental health problems (Dauber et al., 2009; Schinke et al., 2009). Daughters' depressive symptoms were measured using the standardized 10-item Center for Epidemiological Studies Depression Scale (Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001). Participants were asked how they felt during the previous week (7 days), with responses rated as follows: $0 = rarely\ or\ none\ of\ the\ time$ (<1 day); $1 = some\ or\ a\ little\ of\ the\ time$ (1–2 days); $2 = occasionally\ or\ a\ moderate\ amount\ of\ time$ (3–4 days); or $3 = all\ of\ the\ time$ (5–7 days). The observed range of the 10 items was 1 to 30 ($M = 12.9$). Internal reliability was .84.

Statistical Analysis

STATA/SE Version 11 (StataCorp LP, College Station, TX, USA) was used to conduct zero-order correlations to explore relations among all variables and to conduct multivariate logistic analyses. Four models were developed. The first two models examined direct and interaction effects using characteristics of both mothers and daughters. The third and fourth models analyzed subgroup samples by HIV status to examine within-group differences. The first model focused on direct relationships between daughters and family environment characteristics and daughters' alcohol use, whereas the second model included two interactions: (a) maternal alcohol use during the previous 30 days and maternal HIV-infection status and (b) maternal report of importance of not drinking in front of daughter and maternal HIV-infection status. The third and fourth model analyzed the sample by HIV status.

Maximum likelihood estimation in multivariate logistic regressions was used to effectively respond to missing data. Using maximum likelihood estimation with the current rate of missing data (highest rate was 8%) is considered the most adequate way to obtain unbiased estimation parameters (Allison, 2002). We used the CLUSTER command in STATA to account for the expected high correlation among mother and daughter variables using dyadic data. The CLUSTER option was used to account for the multilevel structure

Table 2.   Zero-Order Correlations Between Variables ($N = 176$)

Variable	1	2	3	4	5	6	7	8
1. Daughter used alcohol during previous 30 days[a]								
2. Daughter age	.22**							
3. Daughter depressive symptoms	.17*	.08						
4. Mother has HIV[a]	.11	.03	.08					
5. Mother used alcohol during previous 30 days[a]	.17*	.13	−.09	.11				
6. Maternal report of importance of not drinking in front of daughter	.09	−.01	.01	−.07	−.04			
7. Maternal report of importance of religion	−.19**	−.01	.17*	−.14*	.01	.08		
8. Maternal attendance at religious services	−.20**	−.10	−.17*	−.19*	−.07	.07	.32	
9. Maternal difficulty talking to daughter about alcohol	−.06	−.02	−.01	−.08	.26***	.13	.08	.07

Note. $*p < .05$, $**p < .01$, $***p < .001$.

a. Variables are dichotomous but were included in correlation matrix for exploratory purposes.

of the data (clients nested in programs) and obtain more accurate estimates of standard errors (Blakely & Woodward, 2000), as suggested in other research (Guerrero, Cepeda, Duan, & Kim, 2012). Finally, Wald chi-squared statistics and quadrature point examinations were used to determine if the regression estimates were adequate.

Results

Nearly one third of daughters (28%) reported having used alcohol during the previous 30 days; there were no differences in reported mean use of alcohol in the past 30 days by maternal HIV serostatus ($M = 2.4$ for daughters of HIV-uninfected mothers and 2.5 for daughters of HIV-infected mothers; range = 1–10). The bivariate analysis provided preliminary support for three of our expected outcomes. Although no statistically significant relationship was found between maternal HIV status and daughters' alcohol use during the previous 30 days, daughters' reports of alcohol use were positively associated with maternal alcohol use ($r = .17$, $p < .05$) and negatively associated with maternal report of the importance of religion ($r = −.19$, $p < .01$) and attendance at religious services ($r = −.20$, $p < .01$; see all correlations in Table 2).

However, after accounting for daughters' age and depressive symptoms, findings from multivariate logistic regressions did not indicate statistically significant relationships between maternal HIV status, using alcohol during the previous 30 days,

using alcohol in front of daughters, having difficulty communicating with daughters about alcohol use, or daughters' alcohol use. The only statistically significant relationship with daughters' alcohol use was maternal difficulty talking to daughters about alcohol ($OR = 1.56$; 95% $CI = 1.05$ to 2.03; $\chi^2[8, 159] = 21.81$; $p < .001$). See regression analysis for Model 1 in Table 3.

In addition, the association between maternal attendance at religious services and daughters' alcohol use was not statistically significant. Yet greater importance of religion as reported by mothers was associated with decreased odds of alcohol use among daughters ($OR = 0.42$; 95% $CI = 0.21$ to 0.83).

Further, maternal alcohol-related role-modeling behaviors (using alcohol during the previous 30 days and attitude toward drinking alcohol in front of daughter) and daughters' alcohol use was not moderated by HIV status. That is, there were no differences between groups (HIV-infected and HIV-uninfected households; see Table 3, Model 2). However, there were differences in the HIV-infected subgroup. The 64 dyads in the HIV-infected sample showed a significant increase in the odds of daughters' alcohol use associated with maternal report that drinking alcohol in front of daughters did not matter ($OR = 2.45$; 95% $CI = 1.24$ to 4.80; $\chi^2[7, 64] = 26.68$; $p < .001$). Although this model cannot be compared to the full model due to different sample sizes and differences in testing between- versus within-group differences, it showed the heterogeneity of the HIV-infected sample in terms of risk factors.

Table 3.   Multivariate Logistic Regression of Individual and Family Environment Characteristics and Daughters' Alcohol Use

	Daughters' Alcohol Use			
	Model 1		Model 2	
Variable	**OR**	**95% CI**	**OR**	**95% CI**
Daughters' characteristics				
Age	1.38**	1.08 to 1.75	1.34**	1.03 to 1.73
Depressive symptoms	1.06	1.01 to 1.13	1.07*	1.01 to 1.14
Family environment characteristics				
Mother has HIV[a]	1.46	0.69 to 3.09	0.02	0.01 to 2.93
Mother used alcohol during previous 30 days[a]	1.78	0.78 to 4.04	1.89	0.80 to 4.50
Maternal report of importance of not drinking in front of daughter	0.99	0.74 to 1.31	0.92	0.52 to 1.63
Maternal report of importance of religion	0.42**	0.21 to 0.82	0.30**	0.11 to 0.80
Maternal attendance at religious services	0.84	0.63 to 1.10	0.94	0.65 to 1.36
Maternal difficulty talking to daughter about alcohol	1.56*	1.05 to 2.03	1.08	0.52 to 2.22
Interaction terms				
Mother used alcohol during previous 30 days × maternal HIV-infected status			0.98	0.20 to 4.88
Maternal report of importance of not drinking in front of daughter × maternal HIV-infected status			1.94	0.80 to 4.74
Pseudo R^2	.15		.16	
Wald chi-squared	(8)[b]	21.81**	(10)[b]	26.86**
Observations	159		159	

Note. *p < .05, **p < .01.
a. Coded 1 for HIV-infected status or alcohol use.
b. *df* = degrees of freedom.

Discussion

The goal of this study was to better understand ways in which mothers are able to influence the alcohol use behaviors of their adolescent daughters through maternal role modeling and whether there were noted differences by maternal HIV serostatus. Both individual characteristics of adolescent girls (age and depressive symptoms) and maternal religiosity were relevant to this study of alcohol use among Black and Hispanic adolescent girls residing in inner-city communities, many of whom were living in households with an HIV-infected mother. Findings highlighted the value of maternal communication, role modeling, and religiosity on engagement in drinking by adolescent girls. Given the potential for adolescents to experience added stressors associated with residing with an HIV-infected parent, we further explored these concepts by maternal HIV serostatus. Supportive of prior literature, maternal role modeling (use of alcohol during the previous 30 days), importance of religion, and attendance at religious services were all correlated with daughters' alcohol use during the previous 30 days. After accounting for daughters' age and depressive symptoms and the interaction between maternal communication and role modeling and HIV serostatus, the value placed on religion by mothers (but not necessarily their engagement in religiously oriented activities) was the only protective factor associated with daughters' alcohol use in the full sample.

Emerging evidence has suggested that significant differences exist in risk behaviors among adolescents of HIV-infected parents (Brook, Brook, et al., 2010). Households with an HIV-infected parent reported statistically significant higher rates of maternal alcohol use (39%) compared to the HIV-uninfected sample (24%). Although HIV-uninfected mothers were more common in the full sample (63%), characteristics of the HIV-infected sample (e.g., sample size and significant differences in scores, due to few extreme scores) may have influenced statistically significant relationships observed in the full sample, particularly due to the presence of more extreme scores. This highlights the value of conducting within-group

analyses when possible to increase clarity and the practical value of research findings. Without within-group analyses, assumptions might have been made regarding the homogeneity of HIV-infected families. These nuanced analyses remind us that in clinical practice, we must account for the potential added risk of living with an HIV-infected family member, given the potential burden of stress, stigma, poorer physical and mental health, reduced employment ability (potentially decreasing income), and residence in high-stress environments.

Limitations

The main limitations of this study were related to the data. Because this is an under-researched and hard-to-reach group, we relied on a convenience sample drawn from social services agencies; thus, findings cannot be generalized to the regional population. However, our findings related to religion, parental role modeling, and adolescent high-risk behaviors are consistent with other studies using nationally representative samples (Sinha et al., 2007). Other limitations include the limited robustness or psychometric properties of single-item measures, such as importance of religion, drug use, and family environment. However, considering the level of statistical significance with this discrete sample ($p < .001$), we argue that these preliminary measures, as administered, were rather stable. Lacking a measure of perceptions of communication with mother about alcohol use is another limitation; future work should include perceptions of parenting behaviors by adolescents to more clearly elucidate the link between messages given, messages received (perceptions), and alcohol use behaviors.

In addition, we did not have an adequate sample to assess these potential differences by race and ethnicity; larger samples would also allow for analysis of cultural differences by race and ethnicity and their potential influence on factors associated with mother and daughter alcohol use. Further, participant responses may have been biased given the sensitive nature of scale items and the self-reported nature of the measures. However, several steps were taken to increase the accuracy of these self-reports. Participants were asked to recount behaviors during a short period to increase memory, and the importance of responding honestly was

emphasized. Participants were also assured that their reports would be kept strictly confidential. Additionally, mothers and daughters were both provided with assurances that their responses would not be shared with each other. These steps have been known to increase the accuracy of self-reports about sensitive behaviors (Ford, Millstein, Halpern-Felsher, & Irwin, 1997). Finally, we used cross-sectional data, and although we accounted for correlations between mothers and daughters, we cannot make claims of causality or directionality. Our findings are preliminary and should lead to longitudinal research with repeated measures and a battery of scales related to religiosity, communication, and drug use.

Conclusion

The findings of this study have clear implications for future research on risk factors associated with maternal HIV and for nursing practice with this vulnerable population. Future research should consider different analytic steps to produce accurate estimates when exploring associations between HIV serostatus and outcomes. Using a full sample and only accounting for HIV serostatus may increase the risk that unobserved heterogeneity associated with the HIV-infected sample might explain the statistically significant relationships identified. We have made this unique contribution to the statistical analysis of HIV-infected and HIV-uninfected dyadic samples by relying on a limited but unique sample of HIV-affected racial minority mothers and their daughters. Future research should consider larger samples of parent–child dyads to have adequate power to explore the role of family context in the use of alcohol by adolescent girls.

By understanding contextual factors such as maternal religiosity and use of alcohol in front of children, nursing practice can target interventions to reduce the risk of alcohol use in this vulnerable, low-income, and inner-city population. Future research should further explore the role of maternal engagement in religious activities to determine the extent to which it strengthens mother-led families to establish family norms that are protective in nature. Overall, the study highlighted the vulnerability of families with an HIV-infected parent and

the importance of investing additional resources in practice and research.

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Key Considerations

- During medical care visits, the history and physical examination of patients should include assessment of alcohol use and communication regarding substance use.
- A respectful and comfortable patient–provider relationship is key to open discussion about sensitive subjects such as substance use and religion.
- Nurses should engage families in discussion of communication regarding alcohol and substance use to determine how and if this communication occurs.
- Sensitivity to norms and individual, familial, and environmental stressors related to alcohol use is critical to working with patients to formulate actionable changes in both personal alcohol use and parenting behaviors to reduce adolescent alcohol use.

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Disclosures

Acknowledgments

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