



Alcohol outlet density and related use in an urban Black population in Philadelphia public housing communities



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ABSTRACT

Adolescent alcohol use behaviors are influenced by familial patterns and neighborhood factors. This work explored the influence of individual, family, and environment on alcohol use. Baseline data from a randomized controlled trial with Black mothers son dyads ($n=382$) were paired with census tract and alcohol control board data. Among mothers, younger age, along with neighborhood factors of alcohol outlet density, race, and education were significantly associated with use. Among sons, older age and alcohol outlet density in the neighborhood predicted use. Findings highlight neighborhood influence, beyond family qualities, as a significant determinant of disadvantaged Black mothers' alcohol use. Implications for public health policy are discussed.

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1. Introduction

Social determinants of health at the family and neighborhood levels are well-known influences on health behaviors (U.S. Department of Health and Human Services, 2013). Alcohol use behaviors are influenced by familial patterns of communication and role modeling and contextual neighborhood factors such as poverty density, housing status, and alcohol outlet density (Luk et al., 2010; Resko et al., 2010; Theall et al., 2011). The goal of this study was to use individual, family, and neighborhood variables in conjunction with GIS analysis to explore alcohol use from an ecological perspective. Although previous studies have undertaken such methods to examine alcohol density and use (Livingston et al., 2007; Popova et al., 2009), none has explored factors at the individual, familial, and environmental levels using data from both parents and children. This study addressed that gap in the literature by exploring the influence of individual, intrafamilial, and environmental factors on alcohol use among Black mothers and sons living in public housing communities.

1.1. Influence of family on adolescent alcohol use

Parenting factors have been found to contribute to alcohol use among adolescents. Parent–child communication has been cited as a significant factor in adolescent alcohol use behavior, although the directionality of these outcomes has been questioned (Luk et al., 2010; Martyn et al., 2009; Miller-Day and Kam, 2010; Song et al., 2012). This inconsistency may indicate that other family processes serve as protective mechanisms against adolescent alcohol use. Family qualities shown to influence alcohol use include parent–child relationship quality (Kuendig and Kuntsche, 2006), parental role modeling (Latendresse et al., 2008), and monitoring (Kuntsche et al., 2008). The only study examining the effects of family factors and proximity to alcohol outlets on adolescent alcohol use found that although proximity to alcohol outlets was associated with alcohol use, consistent parenting reduced the risk of alcohol use by nearly 50% (West et al., 2010).

1.2. Influence of neighborhood on alcohol use

Neighborhood geographic variables have been repeatedly noted as predictors of adult alcohol use, with neighborhood disadvantage usually measured as the cumulative effect of four census variables: percentage of residents living below the poverty line, percentage of woman-headed households, unemployment

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rate, and percentage of families receiving public assistance (Boardman et al., 2001). Theorists (e.g., Gruenewald, 2007; Scribner et al., 2010) also note that alcohol outlets are associated with alcohol use and related problems. As noted by Gruenewald (2011), alcohol outlets are more often found in areas where rents are lower, creating a higher concentration of alcohol outlets in low-income areas (Gorman and Speer, 1997). This has been shown to contribute to increase public health issues among already vulnerable populations, including increases in child abuse (Freisther et al., 2008), partner violence (Cunradi et al., 2011; Livingston, 2011; McKinney et al., 2009), and gun violence (Branas et al., 2009; Grubestic et al., 2013). Alcohol outlet density has also been shown to contribute to alcohol use, but less consistently. Although some studies found that the number of alcohol outlets in close proximity to an individual's residence was associated with alcohol use and heavy drinking (Scribner et al., 2000; Weitzman et al., 2003), particularly among women (Theall et al., 2011), factors other than outlet density were more significant predictors (Picone et al., 2010; Pollack et al., 2005). Type of outlet (on-site such as a bar vs. off-site such as a liquor store) was also related to problem drinking, with on-site sales being more predictive of excessive alcohol consumption (Truong and Sturm, 2007).

Findings regarding the effect of neighborhood qualities on adolescent alcohol use have been mixed. Although attributes of neighborhoods and schools have been significantly related to early initiation of alcohol use, contrary to expectations, higher rates of lifetime alcohol use were found among both youths and adults in neighborhoods that offered more social advantages (Kuntsche et al., 2008). In one study the perception of restaurant and bar density in an adolescent's community was related to alcohol consumption (Kuntsche et al., 2008), yet another study found no association between perceptions of the density of liquor stores or other off-premise alcohol outlets and consumption (Truong and Sturm, 2007). Additionally, perceived neighborhood disorder was related to adolescent alcohol, tobacco, and marijuana use (Ennett et al., 1997). As such, ecological studies of alcohol outlets are of fundamental importance (Gruenewald, 2011); this work approaches the work from an ecological approach, considering the individual, parent, and community level influences on alcohol use among Black adolescent boys.

1.3. Purpose

While researchers have noted the influence of alcohol outlet density on a number of serious public health issues (e.g. violence), there has been a dearth of research exploring multilevel influences on adolescent alcohol use, and no study has used primary data from both parents and children alongside neighborhood-level factors collected through administrative data to explore this issue. Therefore, the specific aims of this study were to: (1) examine individual factors associated with alcohol use among Black adolescent mothers and sons (ages 11–15) residing in public housing communities; (2) explore the influence of family factors (i.e., mother–son alcohol communication, maternal alcohol use [role modeling], monitoring, and mother–son relationship) on sons' alcohol use; and (3) examine the distribution of alcohol outlets throughout the city of Philadelphia and how alcohol outlet density is associated with adult and adolescent alcohol use. We hypothesized that: (1) older sons and those living in a one-parent home would be more likely to report drinking alcohol; (2) parental monitoring would be associated with less reported alcohol consumption among sons; and (3) higher alcohol outlet density and lower neighborhood education would be associated with alcohol use among both mothers and sons.

This study was unique in several ways. First, because the sample participants were mother-and-son dyads, we were able

to explore their behaviors at the individual and dyadic level, allowing us to test the social ecological model (Bronfenbrenner, 1986). Second, this sample was distinct from the general population in that it consisted of individuals with disadvantaged race and ethnicity and socioeconomic status (all participants self-identified as Black and resided in public housing communities). Results from this study have implications for community planning and policies regarding prevention of alcohol use in government-assisted housing communities and prevention at the dyadic level.

2. Methods

2.1. Study design

This work is an analysis of data from a randomized control trial (RCT) and administrative sources. The RCT evaluated the effectiveness of a peer-delivered HIV-risk-reduction intervention. The original study (1998–2002) included 526 Black mothers who resided in public housing communities in Philadelphia, PA, and her adolescent son 11–15 years of age. Mothers were recruited through lists of women generated by the Philadelphia Housing Authority for each of the 42 public housing communities. Women were selected at random from each housing community and invited to participate health promotion intervention. If potential participants did not have telephones, the site coordinator went door to door to extend an invitation. To enroll, both the mother and her son had to agree to participate; if the mother had more than one son between 11 and 15 years old living with her, the oldest son was invited to participate. Consent/assent was obtained prior to enrollment. Once enrolled, mothers were randomly assigned to either a (1) HIV-risk-reduction condition or (2) control condition in which they received a general health promotion intervention to reduce their and their son's risk of behavior-linked diseases, including tobacco, alcohol, and drug use, and to promote exercise and healthy eating. The interventions, led by specially trained Black facilitators from the housing developments, were structurally similar. All data were collected via self-administered survey; mothers and sons were not seated together during survey completion and both were encouraged to provide honest answers (no data was shared between the dyad). Institutional review board approval was provided by the University of Pennsylvania for the original study and University of Southern California for the secondary analyses.

In the current study, we used baseline data to explore associations between individual, familial, and environmental factors and adolescent alcohol use. Of the 526 mother–son dyads from whom data was collected (all mothers participated in the intervention), we included participants from 35 housing communities. Participants who resided in scatter-site public housing were not included in the geographic analysis because their exact address could not be confirmed ($n=144$ dyads) leaving us with a final sample size of 382 dyads for these analyses. Bivariate analyses revealed no statistical differences in demographic variables when comparing scatter-site residents to housing community residents, except housing community resident mothers were twice as likely to be employed ($OR=1.94$; $p<0.05$) and half as likely to have less than a high school education ($OR=0.49$; $p<0.01$). The final sample for this work consisted of 382 dyads. Administrative census data from 2000 (middle of study years) and alcohol outlet data from 2003–2006 complemented the RCT baseline data.

2.2. Participants

Data for these analyses were provided by Black mothers and their sons who resided in public housing communities in Philadelphia, PA. The average age of mothers was 38 years and the average age of sons was slightly less than 14 years (see Table 1). Twenty-eight percent of

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