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EFFECTS OF BEVERAGE-SPECIFIC ALCOHOL CONSUMPTION ON DRINKING BEHAVIORS AMONG URBAN YOUTH*

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Abstract

Alcoholic beverage consumption among high school students has shifted from beer to liquor. The current longitudinal study examined the effects of beverage-specific alcohol use on drinking behaviors among urban youth. Data included 731 adolescents who participated in Project Northland Chicago and reported consuming alcohol in 7th grade. Logistic regression tested the effects of beverage-specific use on consequences (e.g., alcohol use in the past month, week, heavy drinking, and ever drunkenness). Compared to wine users, adolescents who reported drinking hard liquor during their last drinking occasion had increased odds of alcohol use during the past month (OR = 1.44; 95% CI = 1.01–2.05), past week (OR = 3.37; 95% CI = 1.39–8.18), and ever drunkenness (OR = 1.56; 95% CI = 1.07–2.29). Use of hard liquor was associated with increased risk of alcohol-related consequences. Early selection of certain alcoholic beverages (e.g., hard liquor) may result in negative health outcomes and problematic alcohol use over time.

Despite slight declines in recent decades, alcohol continues to be the drug of choice among adolescents in the United States (Johnston, O'Malley, Bachman, & Schulenberg, 2009). Approximately 39% of 8th-grade youth have used alcohol in their lifetime and by the end of high school, 72% have initiated use (Johnston et al., 2009). More importantly, alcohol is a key contributor to the leading causes of death among those 10 to 24 years—motor-vehicle mortality, suicide, and other unintentional injuries (Centers for Disease Control and Prevention [CDC], 2007). Epidemiologic data suggests that beverage consumption among high school students has shifted from beer to liquor (Johnston et al., 2009). Yet, few studies have examined the effects of beverage-specific alcohol use, particularly hard liquor, on drinking behaviors among early adolescents.

Evidence suggests that the types of alcoholic beverages adolescents consume are changing. According to the Monitoring the Future (MTF) study, beverage consumption among high school students has shifted from beer to liquor over the past 15 years (Johnston et al., 2009). Among 12th graders, the prevalence of beer consumption in the past month decreased from 47.2% in 1991 to 33.7% in 2008; during the same time period, however, the prevalence of liquor use increased slightly from 31.1% in 1990 to 32.4% in 2008 (Johnston et al., 2009). This pattern may be associated with increases in liquor-specific marketing targeting youth ages 12 to 20, especially among Black and Hispanic youth (Center on Alcohol Marketing and Youth [CAMY], 2005, 2006, 2008a).

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The study of beverage-specific consumption among adolescents is important for several reasons. Few studies have examined consequences that may result from specific types of alcoholic beverages consumed during early adolescence. In addition, consumption of specific types of alcohol may be associated with differential levels of alcohol consumption and alcohol-related consequences. More importantly, many prevention strategies to reduce underage drinking are beverage-specific (e.g., taxes on specific alcoholic beverages).

Seven previous studies have examined the relation between beverage-specific consumption and increased consumption and harm among adolescents (CDC, 2007; Flensborg-Madsen, Knop, Mortensen, Becker, Makhija, Sher, et al., 2008; Lintonen & Konu, 2003; Miller & Plant, 2003; Naimi, Brewer, Miller, Okoro, & Mehrotra, 2007; Smart & Walsh, 1995; Sutherland & Willner, 1998; Walton, Cunningham, Goldstein, Chermack, Zimmerman, Bingham, et al., 2009). These studies have demonstrated that consumption of beer and liquor among adolescents has been associated with increased frequency of drinking and drunkenness, tobacco use, truancy from school, violent and delinquent behavior, heavy and high-risk drinking, and exposure to illegal drugs. These studies, with the exception of one study (Moore & Werch, 2007), were cross-sectional. Of these seven studies, two were conducted in the United Kingdom (Miller & Plant, 2003; Sutherland & Willner, 1998), one in Finland (Lintonen & Konu, 2003), one in Australia (Hemphill, Munro, & Oh, 2007), two in Canada (Smart & Walsh, 1995, 1999), and only two studies were conducted in the United States (CDC, 2007; Moore & Werch, 2007). Thus, most studies evaluating beverage-specific alcohol use have been conducted outside of the United States and are limited by cross-sectional data.

Among the studies conducted in the United States, both focused on effects of beverage type during early and middle adolescence (CDC, 2007; Moore & Werch, 2007). According to a report from the CDC (2007), liquor was the most frequently reported beverage used by high school students in the four states included in the study (Wyoming, Arkansas, New Mexico, and Nebraska), with estimates ranging from 34.1% in Nebraska to 44.7% in Arkansas. In addition, Moore and Werch (2007) found that flavored coolers and wine were the most prevalent beverages used by a sample of primary African-American and White adolescents in 9th through 12th grades, and flavored drinks were significantly related to past month alcohol use, heavy drinking, and “chugging”; however, as adolescents aged, hard liquor became more strongly associated with heavy use and “chugging” (Moore & Werch, 2007). Moore and Werch (2007) is the only study in the United States that has used longitudinal data to examine the relation between beverage-specific use and alcohol consumption patterns. No studies have focused specifically on minority and urban adolescents; and only one has evaluated the effects of beverage-specific consumption specifically focusing on urban adults (Singer & Petchers, 1987). This low-income, minority population is of special interest due to the focus on reducing health disparities in *Healthy People 2020* (Department of Health and Human Services, 2009).

THE CURRENT STUDY

The current study seeks to understand the effect of beverage-specific alcohol consumption on alcohol-related risk behavior among multi-ethnic, urban adolescents. This study includes data from a cohort of urban 7th and 8th grade multiethnic adolescents in Chicago, Illinois. We examined the consumption prevalence of five alcoholic beverages, including beer, wine or wine coolers, malt beverages, hard liquor, flavored drinks (e.g., Apple Jack), and the effects of beverage-specific use in 7th grade on drinking behavior in 8th grade. Specifically, this study addressed three research questions:

1. what is the most prevalent type of beverage consumed;

2. what are the effects of beverage-specific use on alcohol behaviors 1 year later (e.g., heavy drinking, past week use); and
3. what are the primary sources for each type of beverage?

Based upon the prior literature (CDC, 2007; Flensborg-Madsen et al., 2008; Moore & Werch, 2007; Smart & Walsh, 1995), we expect that the prevalence of hard liquor, beer, and wine will be similar; and that hard liquor use will be associated with increased alcohol use (Flensborg-Madsen et al., 2008; Lintonen & Konu, 2003; Miller & Plant, 2003; Smart & Walsh, 1995).

METHODS

Research Design

Data were part of Project Northland Chicago (PNC), a group-randomized controlled trial testing the efficacy of a multi-component alcohol preventive intervention for multi-ethnic urban youth (Komro, Perry, Veblen-Mortenson, Bosma, Dudovitz, Williams, et al., 2004; Komro, Perry, Veblen-Mortenson, Farbukhsh, Toomey, Stigler, et al., 2008). A cohort of youth enrolled in 61 public schools in Chicago participated in the study (29 schools assigned to the intervention, 32 to the comparison group) and completed self-report questionnaires when in 6th through 8th grades. Details on the research design, sample characteristics, measures, and outcomes can be found elsewhere (Komro et al., 2008). Parent consent and student assent procedures were approved by the University of Minnesota Institutional Review Board for the Protection of Human Subjects and the Chicago Public Schools' Law Department. A Certificate of Confidentiality was also obtained from the U.S. Department of Health and Human Services to further protect the confidentiality of the student responses. The University of Florida Institutional Review Board approved conduct of secondary data analyses.

Participants

The 7th grade PNC study sample included 2,096 adolescents in the control condition. Among these, 998 (47.6%) reported consuming alcohol within the past year, and therefore were eligible for inclusion in the current study. Of these, 731 (73.2%) responded to an alcoholic beverage type item. Participants who reported using alcohol in the past year but did not report using a specific type of alcoholic beverage were excluded from the analysis (n = 267). Youth who responded to the type of alcoholic beverage consumed on the last drinking occasion item were significantly more likely to have been ever drunk ($\chi^2 = 273.4$; $p < 0.0001$), reported using alcohol in the past week ($\chi^2 = 196.3$; $p < 0.0001$) and past month ($\chi^2 = 413.3$; $p < 0.0001$), and were heavy users ($\chi^2 = 158.2$; $p < 0.0001$) when compared with other drinkers who did not respond to the beverage type item, indicating the high-risk nature of our analysis sample. There were no demographic differences between groups (e.g., gender, race/ethnicity, household structure, free or reduced price lunch status, and age). The adolescents included in the current study had an equal gender distribution (51.9% male), 40.0% were Black, 43.1% identified as Hispanic, and 16.9% as White or other racial background. The majority of participants resided in two-parent households (50.5%), and 69.2% were low-income (received free or reduced-price lunch). The mean age was 13.3 (sd = .48).

Measures

Beverage Type—Adolescents were asked, "If you have ever had an alcoholic drink, think back to the last time you drank. What did you drink (*mark all that apply*)." Response options were:

1. beer,
2. malt liquor (e.g., Colt 45, or Schlitz Red Bull),
3. Wine or wine cooler,
4. Flavored alcohol drink (e.g., Sublime, Hooper's Hooch, Mike's Hard Lemonade, Apple Jack),
5. hard liquor (e.g., whiskey, or vodka), and
6. mixed drinks (e.g., rum and coke). Each response option was coded dichotomously such that "1" indicated that beverage was drank during last drinking occasion and "0" did not. Hard liquor and mixed drinks were combined into one response category to be consistent with the extant literature, as both types are derived from distilled spirits.

Drinking Behaviors—*Heavy drinking* was assessed with one item: "Think back over the last two weeks, how many times have you had five or more alcoholic drinks in a row?" Response options were dichotomized to reflect "0" versus "1 or more occasions". Adolescents were categorized as heavy drinkers if they reported having five or more alcoholic drinks in a row at least once in the previous two weeks. *Ever drunkenness* was measured with one item: "Have you ever gotten really drunk from drinking alcoholic beverages, so you fell down or got sick?" Response options were dichotomized to indicate "Never Drunk" or "Drunk one or more times". *Past month* alcohol use was evaluated by asking, "During the last 30 days, on how many occasions, or times; have you had alcoholic beverages to drink?" Responses were coded as "0" for no use, and "1" for one or more reported occasions. *Past week* alcohol use was measured by the item: "During the last 7 days, on how many occasions, or times; have you had alcoholic beverages to drink?" Responses were coded as "0" for no use, and "1" for one or more reported occasions.

Source of Alcohol—To assess the source of alcohol, participants were asked, "If you have ever had an alcoholic drink, think back to the last time you drank. How did you get the alcohol?" Responses were coded as, "Parent," "Another adult over 21," "Someone under 21 gave it to you," "Home," "Commercial outlet" (e.g., grocery/convenience store, liquor store, bar, or restaurant), and "Other."

Demographic Variables and Other Covariates—Demographic variables included gender (1 = male, 0 = female), race/ethnicity, and socioeconomic status. Race/Ethnicity was assessed with one self-report item: "How do you describe yourself?" Response options included: Black or African American; Latino, Hispanic, or Mexican American; White, Caucasian, or European American; Asian American; Native American; and Other. Two ethnic variables were created:

1. "Hispanic" was coded as 1 if the youth reported that they were Latino, Hispanic, or Mexican American, and
2. "Black or African American" was coded as 1 if the youth reported that they were either Black or African American; and the reference group included youth who reported any other race/ethnic background.

Family structure was obtained by asking respondents to describe "who you live with most of the time." When both mother and father were selected, respondents were coded as living in a two-parent household. All other combinations were coded as "other." Age was measured as a continuous variable derived from participants' date of birth.

Analytical Strategy

To examine the prevalence of beverage-specific consumption, we created five dummy variables to describe the use of each type of alcoholic beverage during last drinking occasion: beer, malt beverages, wine, flavored beverages, and hard liquor. We used logistic regression to test the effects of type of beverage consumed at age 13 on drinking behaviors at age 14. Specifically, we tested the effects of beer, hard liquor, flavored drinks, and malt beverage consumption on four drinking behaviors, including past month use, past week use, ever being drunk, and heavy drinking in the past 2 weeks. Wine users were selected as the reference group because the literature suggests that increased risk is associated with other beverage types compared to wine (Flensborg-Madsen et al., 2008; Miller & Plant, 2003; Naimi et al., 2007; Smart & Walsh, 1995, 1999). All logistic regression models were adjusted for race/ethnicity, age, gender, family structure, and baseline alcohol use. Robust clustered standard errors were calculated to account for the multilevel nature of the data (since participants were nested within 32 schools). All analyses were conducted in Statistical Analysis Software (SAS) 9.2 (Statistical Analysis Software [SAS] Institute, 2004).

RESULTS

Prevalence of Type of Beverage

To identify the types of beverages most frequently consumed by youth in 7th grade (our first research question), we examined the prevalence of wine, beer, hard liquor, flavored drinks, and malt beverage consumption (Table 1). Results indicated that the prevalence of wine use (40.2%), although higher, was not significantly different than the prevalence of beer (34.5%; $z = -1.38$, $p = 0.167$). The prevalence of wine was significantly higher when compared with the prevalence of hard liquor (31.6%; $z = -2.04$, $p = 0.042$), flavored drinks (22.9%; $z = -3.79$, $p = 0.000$) and malt beverages (3.8%; $z = -3.81$, $p = 0.000$). No significant differences were observed between the prevalence of beer and hard liquor ($z = -0.67$, $p = 0.503$).

Effects of Type of Beverage Consumption at Age 13 on Drinking Behaviors at Age 14

Unadjusted Models—Before adjusting for baseline drinking behaviors at age 13 or any other covariates (see Table 2), hard liquor use at age 13 was associated with increased drunkenness (OR = 2.36; 95% CI = 1.66–3.34), heavy alcohol use (OR = 1.59; 95% CI = 1.05–2.41), past month (OR = 1.83; 95% CI = 1.31–2.01) and past week alcohol use (OR = 2.00; 95% CI = 1.362–2.96) at age 14 when compared with wine use. Beer use at age 13 also predicted drunkenness at age 14 (OR = 1.58; 95% CI = 1.10–1.19). There were no significant differences on the effects of malt or flavored beverages on drinking behaviors when compared to wine users.

Adjusted Models—After adjusting for race, age, gender, family structure, and baseline alcohol use (see Table 2), hard liquor use was significantly associated with increased risk for drunkenness (OR = 1.56; 95% CI = 1.07–2.29), alcohol use in the past week (OR = 3.37; 95% CI = 1.39–8.18), and alcohol use in the past month (OR = 1.44; 95% CI = 1.01–2.05) when compared with wine users. The effects of hard liquor use on heavy drinking (OR = 1. 95; CI = 0.88–2.09) and beer use on drunkenness (OR = 1.42; CI = 0.97–2.08), although in the expected direction, were no longer significant in this model. Post-hoc analyses revealed a significant ethnicity and type of beverage interaction: Hispanics who drank hard liquor were significantly less likely to have used alcohol in the past week (OR = 0.31; 95% CI = 0.11–0.88) compared to non-Hispanics; however, a stratified analysis of Hispanics indicated no significant relationship between hard liquor and past week use compared to non-Hispanics (OR = 0.89; 95% CI < 0.48–1.68). The interaction was not significant for other racial/ethnic groups.

Sources of Type of Beverage

As described in Figure 1, parents were the primary sources of alcohol for all types of beverages, with the exception of hard liquor (for hard liquor, other adults and parents were equally the primary sources). Obtaining alcohol from someone under 21, home, and commercial outlets were less common sources. Overall, among the drinkers in this sample, alcohol was most frequently obtained from parental sources.

DISCUSSION

The purpose of this study was to estimate the prevalence of beverage-specific alcohol consumption, test the effect of beverage type used at age 13 on drinking behaviors at age 14, and examine differences in the sources of alcohol by type of beverage. The current study provides evidence of the effects of alcohol beverage selection during early adolescence as risk factor for drinking behaviors over time. Specifically, findings indicated a similar prevalence of wine use (40% of adolescents drank wine) compared with beer (35%), and hard liquor (32%) use was significantly lower than wine. Flavored (23%), and malt (4%) beverages were used less frequently on the last drinking occasion (23% and 4%, respectively). This suggests that wine and beer were consumed most frequently within this sample of adolescent drinkers, followed by hard liquor. These prevalence rates are consistent with those reported by Monitoring the Future (MTF) (Johnston et al., 2009) which suggested that 34% of their sample in 12th grade reported drinking beer, and 32% reported consuming liquor. The MTF study, however, did not report a high prevalence of wine use among their sample of high school seniors. In fact, only 14.0% of high school seniors reported using wine in the past 30 days, and this figure has remained relatively stable since 1990 (14.7% reported past month use) (Johnston et al., 2009). However, another study among adolescents in 9th–11th grades found that wine (38.5%), flavored coolers (37.6%), and beer (27.9%) were the most commonly used beverages in the past year (Moore & Werch, 2007). These differences may be attributable to different age groups, general versus high-risk populations, and study methodologies implemented in these studies (i.e., MTF does not collect data among 8th graders on their consumption of wine or spirits, so we could not compare our results to this age group). Future studies should examine whether the prevalence of wine use is higher during early- and mid-adolescence, and whether the prevalence of liquor use increases with age (e.g., during late adolescence and early adulthood).

Findings suggest that use of hard liquor in 7th grade is associated with increased risk of reporting drunkenness and recent alcohol use (past week and past month), after controlling for several demographic variables and baseline drinking behavior. Hard liquor use was significantly associated with increased the risk of heavy drinking before adjusting for baseline alcohol use, which suggests that hard liquor use was relatively high and consistent among adolescent alcohol users in 7th and 8th grade. This finding is consistent with the previous cross-sectional studies, which reported that specific beverages (e.g., hard liquor) are associated with increased drinking frequency, drunkenness, and heavy and high-risk drinking (Flensborg-Madsen et al., 2008; Miller & Plant, 2003; Naimi et al., 2007; Smart & Walsh, 1995). Findings also suggest that sources of alcohol among early adolescents did not vary by beverage type. Parents were the primary source for each specific beverage, with the exception of hard liquor (parents and someone under 21 supplied liquor at similar levels).

The current study has important implications for prevention science and alcohol policy research. First, various strategies to reduce underage drinking are beverage-specific, and understanding what underage youth are drinking may lend support for alcohol-control policies. For example, several studies have shown that alcohol consumption among youth is price sensitive (Chaloupka, Grossman, & Saffer, 2002; Ogilvie, Gruer, & Haw, 2005;

Toumbourou, Stockwell, Neighbors, Marlatt, Sturge, & Rehm, 2007). Alcohol excise and sales taxes represent the most widespread policy affecting retail price of alcohol (Wagenaar, Salois, & Komro, 2009) and taxes are levied separately for each type of beverage. Considering that 40% of our sample are using wine, and one-third of youth are consuming beer (35%) and hard liquor (32%), increasing the price of any type of alcoholic beverage may produce broad, population-level reductions in underage alcohol use, with the largest effects seen with increases across all beverage types.

Second, it is important to acknowledge that marketing practices are also beverage-specific and may influence the differences in beverage-specific consumption patterns observed in this study. For instance, increases in hard liquor specific marketing on cable television which target a large youth audience might be associated with the increased consumption of hard liquor among adolescents observed nationally in the *Monitoring the Future* study (Johnston et al., 2009). The Center on Alcohol Marketing and Youth (CAMY) reported that in 2007, nearly 1 in 5 alcohol advertisements were placed on programming that youth aged 12 to 20 were more likely to see than adults. Among these advertisements, 53% were for beer and 41% were for distilled spirits (CAMY, 2008b). This frequent exposure to beer and liquor advertising may increase the number of drinks by young people by 1% for each additional advertisement seen (Snyder, Milici, Slater, Sun, & Strizhakova, 2006) and may influence the type of beverages that underage youth consume. Further, beer and hard liquor advertising is also prevalent in the communities in which urban youth from our study resided. Pasch and colleagues found that, on average, 15 alcohol advertisements were within 1500 feet of the schools these youth attended (Pasch, Komro, Perry, Hearst, & Farbakhsh, 2007, 2009). Beer and distilled spirits ads were the most prevalent type of alcohol advertised and this exposure was disproportionately located in schools with 20% or more Hispanic students enrolled (Pasch et al., 2009). Thus, alcohol advertising and exposure to advertisement may impact the types of beverages adolescents consume.

Our work is consistent with prior research suggesting that social sources (e.g., parents and peers) are the primary mechanism for alcohol ascertainment by adolescents (Hearst, Fulkerson, Maldonada-Molina, Perry, & Komro, 2007; Komro et al., 2007). Parental sources may be of particular importance, as adolescents who obtained alcohol from parents indicated increased intentions to use alcohol in the upcoming month, past year alcohol use, drunkenness, and heavy drinking (Komro et al., 2007). The current study links the source to specific types of alcohol, and beverage-specific consumption to alcohol-related consequences 1 year later. Therefore, the current study highlights the role of parents as an important target when developing programs to prevent alcohol use among adolescents.

The current study has a few limitations. First, this study does not address the type of beverages that adolescents regularly consume; rather, our measure examined the type of beverage and source of alcohol during the last drinking occasion. Second, this sample was primarily low-income, urban adolescents in Chicago, and thus may not be representative of the general adolescent population. However, this population is important because urban environments are often characterized by neighborhood disorder, increased opportunity for drug use, and weaker economic conditions (Elliott, Wilson, Huizinga, Sampson, Elliott, & Rankin, 1996) and are frequently targeted by alcohol advertisements (CAMY, 2008a). Additionally, the priorities of the Department of Health and Human Services' *Healthy People 2020* are focused on reducing health disparities, and knowledge of these populations is especially useful in reducing such disparities in health outcomes. Third, wine and wine coolers were measured as a single response, and consumption of wine coolers may be more accurately measured by itself or in another category. Future research on beverage selection should focus on characterizing types of alcoholic beverages as specifically as possible

among younger populations across diverse cultural, socioeconomic, and geographical contexts.

Despite the limitations, the current study has several strengths. First, the literature evaluating beverage-specific consumption by adolescents has been conducted primarily on older adolescents in high schools (9–12th grade) and young adults, and to our knowledge, only one study has evaluated beverage type among young adults in an urban population in the United States (Singer & Petchers, 1987). Therefore, it is important to examine whether adolescents have different beverage-specific behavioral tendencies compared to adults. The younger population surveyed in this study permits the examination of beverage-specific consumption during early adolescence, a developmental period where the literature on alcoholic beverage use is scarce. This work is especially necessary because prior research has found that the most problematic drinking (resulting in alcohol dependence and/or abuse later in life) begins before age 14 (Grant & Dawson, 1997). Second, this study utilized longitudinal data on alcoholic beverage use and alcohol-related consequences 1 year later. This is an important contribution to the literature, as the vast majority of extant research has been cross-sectional. Third, adolescents were permitted to specify up to six types of beverages consumed on their last drinking occasion, while previous work has limited response options to beer, wine, and hard liquor. Finally, our study measured adolescent drinking behavior prior to high school, a time period that has been measured previously in only a few studies. To expand upon this study, longitudinal studies should be used to evaluate risk and protective factors associated with predictors and consequences of beverage type consumed. Longitudinal analyses of beverage-specific consumption would be optimal for examining the effect of type of beverage on other consequences later in life (alcohol dependence, abuse, delinquency, etc.). It is possible that there is a gateway effect for certain beverages (e.g., flavored beverages or wine) that are associated with progression to other types of alcoholic beverages (e.g., hard liquor). Identification of predictors that are associated with beverage-specific consumption that best predict heavy drinking (e.g., hard liquor) and parental provision of alcohol are necessary to inform the development of intervention programming. Future studies should examine how these differences in beverage-specific use may be attributable to modeling of parental beverage selection and differential exposure to alcohol advertising. Future research should also examine ethnic differences in the prevalence of beverage-specific alcohol use and the effects on alcohol-related consequences.

These findings have a number of implications for the field of drug education. Prevention of high-risk drinking must occur at a very young age (as many adolescents are drinking alcohol prior to 7th grade), and school programming should include alcohol prevention curricula as a priority to improve health outcomes later in adolescents' lives. This programming is especially necessary in neighborhoods characterized by social disorganization and high levels of alcohol marketing, as exposure to alcohol is associated with early initiation and increased use of alcohol (Snyder, Milici, Slater, Sun, & Strizhakova, 2006). In these neighborhoods, multilevel and multi-component drug education interventions are necessary to target risk factors for the prevention of early alcohol initiation at the neighborhood, school, family, and individual level. Additionally, this study provides support for the development of preventive efforts to reduce the initiation and progression of alcohol behaviors during early adolescence. It is essential that parents, teachers, school nurses, doctors and other health care providers and educators to reduce alcohol problems in their communities and neighborhoods. Preventive medicine has the potential to play an important role in the screening and implementation of interventions targeting early adolescents at high-risk for initiating and developing problematic drinking behaviors, such as those reporting drinking hard liquor during early adolescence.

In conclusion, the current study examined the prevalence of beverage type, sources of each type of beverage, and the effects of beverage-specific alcohol use on drinking behaviors during early and middle adolescence among low-income, urban adolescents. Results from this study provide evidence of the effects of alcohol beverage selection during early adolescence as risk factor for drinking behaviors over time. The majority of 7th grade drinkers consumed wine and beer, followed by hard liquor. Consumption of hard liquor in 7th grade was associated with increased risk for drunkenness, and past month and past week alcohol use in 8th grade. Because these specific beverages shared a similar source (e.g., parents), these findings have important implications for prevention research and the development of alcohol-control policies to reduce underage drinking; and to increase understanding of beverage consumption patterns and consequences among young adolescents from diverse contexts.

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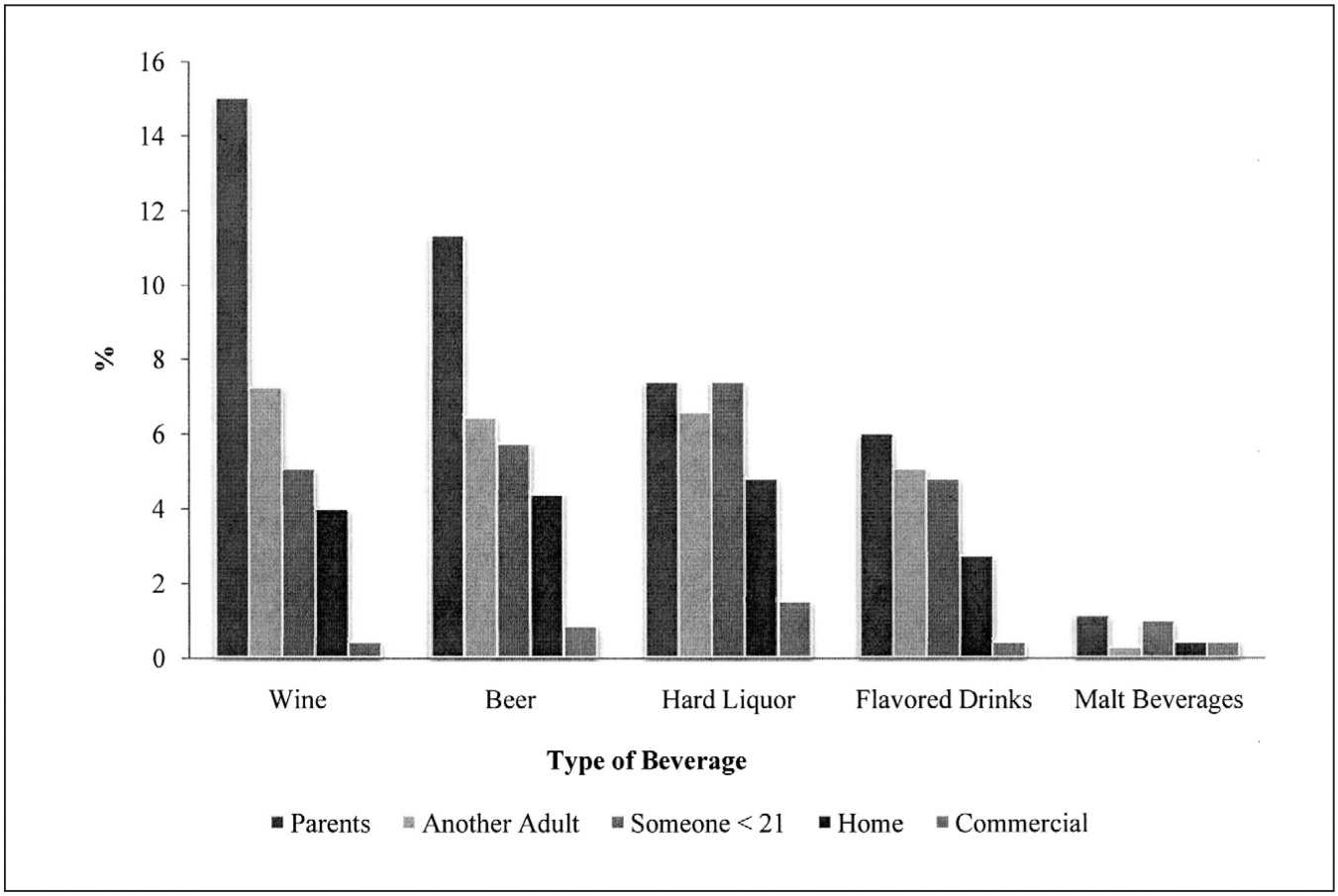

Figure 1.
Sources of alcohol by beverage type in 7th grade (n = 731).

Table 1

Sample Characteristics, 7th Grade, Age 13 (n = 731)

	n	%[a]	*z*	*p*
Type of beverage consumed (age 13)				
Wine	294	40.22	—	—
Beer	252	34.47	−1.38	0.167
Hard Liquor	231	31.6	−2.04	0.042
Flavored drinks	167	22.85	−3.79	0.000
Malt beverage	28	3.83	−3.81	0.000
Sources of Alcohol (age 13)				
Parent	227	34.60	—	—
Another adult	133	20.27	−2.88	0.004
Someone < 21	112	17.07	−3.35	0.001
Home	89	13.57	−3.72	0.000
Commercial	20	3.05	−2.90	0.004
Drinking behaviors (age 14)				
Past month	303	41.51	—	—
Past week	159	21.75	—	—
Ever drunk	254	34.79	—	—
Heavy drinking (2 weeks)	139	19.02	—	—

[a]Type of beverage consumed on last drinking occasion. Participants could select more than one response, so percentages may exceed 100%.

Table 2

Logistic Regression of Type of Beverage Consumed at 7th Grade (Age 13) on Alcohol Use in 8th Grade (Age 14)

	Past month		Past week		Ever drunk		Heavy use	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Unadjusted[a]								
Wine	—	—	—	—	—	—	—	—
Beer	1.14	[0.81, 1.62]	1.19	[0.79, 1.79]	1.80**	[1.10, 2.27]	1.18	[0.77, 1.82]
Hard liquor	1.83***	[1.31, 2.56]	2.00***	[1.36, 2.96]	2.36***	[1.66, 3.34]	1.59*	[1.05, 2.40]
Flavored	1.03	[0.71, 1.50]	0.96	[0.60, 1.51]	1.42	[0.96, 2.10]	0.91	[0.56, 1.48]
Malt	1.13	[0.48, 2.67]	1.04	[0.37, 2.93]	1.48	[0.60, 3.63]	1.67	[0.63, 4.43]
Adjusted[b]								
Wine	—	—	—	—	—	—	—	—
Beer	1.05	[0.73, 1.49]	1.11	[0.73, 0.53]	1.42	[0.97, 2.08]	1.22	[0.78, 1.90]
Hard liquor	1.44*	[1.01, 2.05]	3.37**	[1.14, 0.18]	1.56*	[1.07, 2.29]	1.36	[0.88, 2.09]
Flavored	0.90	[0.61, 1.33]	0.89	[0.55, 1.43]	1.27	[0.84, 1.92]	0.81	[0.49, 1.36]
Malt	1.14	[0.47, 2.74]	0.92	[0.31, 2.74]	0.88	[0.30, 2.60]	1.21	[0.43, 3.46]

[a] Unadjusted models (bivariate relations between beverage type at age 13 and behavior at age 14).

[b] Analyses are adjusted for race, age, gender, family structure, and baseline alcohol use (7th grade; age13).

* $p < 0.05$,

** $p < 0.05$,

*** $p < 0.001$.