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Child abuse and neglect: Relations to adolescent binge drinking in the national longitudinal study of Adolescent Health (AddHealth) Study

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ABSTRACT

The purpose of this study was to examine the relationship between child maltreatment and adolescent binge drinking. Given that many victimized children have been maltreated in multiple ways, we examine the effects of co-occurrence of multiple types of maltreatment on adolescent binge drinking. We used the National Longitudinal Study of Adolescent Health (AddHealth), which included a nationally representative sample of adolescents (n=12,748). Adolescent binge drinking was defined as five or more drinks in a row at least 2–3 times per month in the past year. Among those reporting any maltreatment, 12.4% reported binge drinking compared to 9.9% among those reporting no maltreatment. Logistic regression models found that child maltreatment is a robust risk factor for adolescent binge drinking controlling for parental alcoholism. In particular, all types of or combinations of types of maltreatment were strongly associated with adolescent binge drinking, controlling for age, gender, race, parental alcoholism and monitoring. Research examining the effect of childhood maltreatment on later alcohol abuse needs to recognize the clustering effects of multiple types of childhood maltreatment on alcohol problems.

1. Introduction

Adolescent binge drinking, typically defined as the consumption of five or more alcoholic drinks on a single occasion at least once every 2 weeks (Johnston, O'Malley, & Bachman, 2002), is a major public health problem. The National Survey on Drug Use and Health (SAMHSA, 2007) found that among the 10.8 million underage drinkers aged 12 to 20 in 2005, nearly one-fifth (18.8%) were binge drinkers with more males (21.3%) than females (16.1%) reporting participated in heavy episodic drinking in the past 12 months. Not only is adolescent binge drinking prevalent, but excessive consumption of alcohol by adolescents has been associated with a host of immediate and long-term adverse outcomes including obesity and high blood pressure (Oesterle et al., 2004), neurobehavioral and cognitive symptoms (e.g., headaches, difficulty concentrating, trouble remembering, trouble learning; Brook, Finch, Whiteman, & Brook, 2002; Scheier & Botvin, 1995), unwanted and unprotected sexual activity (Fergusson & Lynskey, 1996; Smart, 1996; Thakker, 1998), unsafe driving practices and motor vehicle crashes (Copeland, Shope, & Waller, 1996; Oesterle et al., 2004; Zakrajsek & Shope, 2006), poor academic attainment (Hill, White, Chung, Hawkins, & Catalano, 2000), and adult alcohol disorder (Schulenberg et al., 1996).

Since adolescent binge drinking occurs in an extraordinary period when adolescents experience dramatic changes in their bodies, affects, and social environment, a successful examination of adolescent binge drinking must take into account not only excessive drinking itself but its developmental contexts. The first Call to Action against youth alcohol problems made by the Surgeon General stressed that if underage drinking is to be reduced and prevented, it must be understood in its developmental contexts including individual, family, and environmental influences (US DHHS, 2007). Understanding the effects of adverse childhood experiences such as child abuse and neglect on adolescent binge drinking is one example.

Childhood maltreatment has been linked to alcohol abuse and dependence among an adult population (Anda et al., 2002; Dube, Anda, Felitti, Edwards, & Croft, 2002). In adult literature, a relatively large body of studies has reported that child maltreatment increases an individual's risk for alcohol abuse, although current evidence is not sufficient to support this relationship among male adults who had been victims of childhood maltreatment (Dube et al., 2002; Widom & Hiller-Sturmhofel, 2001). However, few studies have examined the effect of childhood victimization on adolescent binge drinking. Examination of this association is important for understanding the common pattern of alcohol consumption among adolescents with child abuse and neglect. In addition, although researchers and practitioners have long been aware of the co-occurrence of different types of maltreatment on an individual (Banyard, 1999; Bensley, Van Eenwyk, Spieker, & Schoder, 1999; Felitti et al., 1998; McCauley et al., 1997; McGee, Wolfe, Yuen, Wilson, &

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Carnochan, 1995; Rorty, Yager, & Rossotto, 1994), researchers have rarely examined the joint effect of the co-occurrence of multiple categories of maltreatment on adolescent binge drinking.

Using a nationally representative community sample of adolescents, the current study examines the relations between multiple forms of childhood maltreatment and adolescent binge drinking. The present study will contribute to knowledge about: (1) whether childhood maltreatment is a risk factor for adolescent binge drinking; and (2) how the co-occurrence of multiple categories of maltreatment influences heavy episodic drinking in adolescence.

2. Methods

2.1. Participants

The Add Health is a national longitudinal study that explored the influence of social environment on health in adolescence (grades 7 through 12). The first wave of data collection was conducted in 1995 with 20,745 adolescents completing in-home interviews (79% response rate). Of these 20,745 adolescents, 18,255 (88%) were interviewed at Wave II in 1996, and 15,197 (73%) were interviewed at Wave III in 2002. The present study uses the 12,748 respondents who were interviewed at all three waves and have a Wave III sampling weight.

2.2. Measures

2.2.1. Binge drinking

Respondents were asked, "During the past 12 months, on how many days did you drink five or more drinks in a row?" Adolescent binge drinking was defined as consuming five or more drinks in a row at least 2–3 times per month in the past year at Wave I. The reference category included those who drank less frequently or had never consumed a drink of alcohol in their lives (non-binge drinkers).

Table 1
Childhood maltreatment and sample characteristics

	Total	Any maltreatment	No maltreatment
		n=6729	n=6019
Sex***			
Male (n=5867)	49.6	52.1	46.9
Female (n=6881)	50.4	47.9	53.1
Age*			
12–14 (n=3622)	34.6	36.1	32.9
15–17 (n=7159)	49.6	48.9	50.3
18–21 (n=1964)	15.8	15.0	16.8
Race/ethnicity**			
Non-Hispanic White (n=6778)	68.2	67.0	69.6
Black (n=2501)	15.4	14.8	16.0
Hispanic (n=2007)	11.9	12.8	10.9
Asian (n=824)	3.2	3.9	2.5
Other (n=161)	1.3	1.5	0.9
Parental income[a]*			
0–21,999 (n=2301)	23.8	24.7	22.8
22,000–39,999 (n=2434)	25.2	26.1	24.3
40,000–59,999 (n=2387)	25.1	25.2	25.0
≥60,000 (n=2578)	25.9	24.0	27.9
Parental education			
Not a high school graduate (n=1837)	16.1	16.0	16.2
HS graduate/GED (n=3182)	31.8	31.4	32.3
Technical school or some college (n=3224)	29.2	30.5	27.7
At least a college graduate (n=2730)	22.9	22.2	23.8
Parental respondent works outside home			
Yes (n=8142)	73.4	74.0	72.7
No (n=2870)	26.6	26.0	27.3
Parental alcoholism***			
Yes (n=1572)	16.8	19.1	14.3
No (n=8454)	83.2	80.9	85.8
Consume five or more drinks in a row at least 2–3 times per month***			
Yes (n=1362)	11.2	12.4	9.9
No (n=11386)	88.8	87.6	90.1

*p<0.05, **p<0.01, ***p<0.001. P-values based on within subgroup analyses.
[a] N=9700 (does not include refused or missing).

Table 2
Multivariable adjusted odds ratios (OR) and 95% confidence intervals (CI) for adolescent binge drinking using single types of maltreatment

	Consume five or more drinks in a row at least 2–3 times per month OR (95% CI)
Maltreatment	
No maltreatment	1.00
Any neglect	1.15 (0.96, 1.37)
Any physical abuse	1.19 (0.96, 1.47)
Any sexual abuse	1.42 (0.89, 2.25)
Age at Wave 1	
18–21	1.0
15–17	0.57* (0.46, 0.70)
12–14	0.16* (0.11, 0.22)
Sex	
Female	1.0
Male	1.87* (1.52, 2.29)
Race/ethnicity	
Non-Hispanic White	1.0
Black	0.51* (0.33, 0.79)
Hispanic	0.86 (0.63, 1.18)
Asian	0.43* (0.21, 0.91)
Other	0.73 (0.33, 1.62)
Parental alcoholism	
No	1.0
Yes	1.42* (1.29, 1.53)

* p<0.05.

2.2.2. Predictor measures

Three measures of childhood maltreatment are from the Wave III interview. The Add Health used a computer-assisted self-interviewing (CASI) method in all maltreatment questions in order to reflect their sensitive nature. The questions include: (1) *sexual abuse* — "by the time you started 6th grade, how often had one of your parents or other adult caregivers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?"; (2) *physical abuse* —"how often had slapped, hit, or kicked you?"; and (3) *neglect* —"how often had not taken care of your basic needs, such as keeping you clean or providing food or clothing or how often had left you home alone when an adult should have been with you?". All three childhood maltreatment responses were dichotomized (1 for one or more times, 0 for never). These responses were combined into a eight-category variable measuring maltreatment, categorized as: no maltreatment, neglect only, physical abuse only, sexual abuse only, neglect and physical abuse, neglect and sexual abuse, physical abuse and sexual abuse, and all three types. No maltreatment is the reference category.

The present study also included socio-demographic characteristics such age, gender, race/ethnicity, parental education and occupation, and family income, which are known to have influence on adolescent binge drinking. Parental alcoholism was examined by responses to whether the biological mother or biological father "has alcoholism," and was dichotomized into "yes, at least one biological parent has alcoholism" and "neither parent has alcoholism." Parental monitoring, measured by whether parents work outside the home or not, was used. Parental alcoholism, education and income were based on parental respondent, not child self-report.

2.3. Data analysis

Using chi-square tests, we compared responses to the predictor variables to having experienced any maltreatment versus no maltreatment. Then, we conducted logistic regression analysis to examine the relationship between the six-category maltreatment variable (from the eight-category maltreatment variable, sexual abuse only,

sexual and physical abuse, and sexual abuse and neglect were collapsed into one variable because of the small sample size) and adolescent binge drinking, controlling for age at Wave I, gender, race/ethnicity, parental alcoholism, parental education, income, and working outside the home. Parental education and income were excluded from the final model because they are not significantly associated with binge drinking at $p<0.20$. SUDAAN was used for all analyses that were weighted using the grand sampling weight for longitudinal analyses.

3. Results

3.1. Prevalence of adolescent binge drinking

Table 1 shows the sample characteristics and prevalence of binge drinking. Slightly over one-tenth (11%) consumed five or more drinks in a row at least 2–3 times per month. Adolescents who had been maltreated in childhood were more likely to report binge drinking (12.4%) than those who had not been maltreated (9.9%).

3.2. Childhood maltreatment and adolescent binge drinking

First, using logistic regression analysis, the association between exposure to any maltreatment and adolescent binge drinking was examined, controlling for sociodemographic characteristics, parental alcoholism, and parental monitoring. Exposure to any maltreatment was associated with a 1.33-fold (OR 95% CI: 1.13–1.57, $p<0.05$) increase in risk for adolescent binge drinking. In addition, using logistic regression analysis, Table 2 shows the association between single types of maltreatment and adolescent binge drinking whereas Table 3 shows the relationship between the co-occurrence of multiple categories of maltreatment and adolescent binge drinking, controlling for the same demographic and psychosocial factors. When the traditional maltreatment classification was used (i.e. an individual is classified as ever experiencing one type of maltreatment), maltreatment was not associated with adolescent binge drinking. However, when the co-occurrence of multiple categories of maltreatment was considered, and maltreatment was classified into six categories, all types or combinations of types of maltreatment were associated with adolescent binge drinking, controlling for age, gender, race, parental alcoholism, and parental monitoring. For example, adolescents with neglect-only had 1.2 times higher odds of reporting binge drinking than those with no maltreatment. Compared to adolescents with no maltreatment, adolescents with sexual abuse had more than 2-fold greater odds of reporting binge drinking. Furthermore, adolescents who had experienced both neglect and physical abuse had 1.3 times higher odds of reporting binge drinking than adolescent with no maltreatment. Finally, compared to adolescents with no maltreatment experiences, adolescents who experienced all types of maltreatment were about 1.8 times more likely to report binge drinking. Age, gender, race/ethnicity, and parental alcoholism were also associated with adolescent binge drinking.

Table 3
Multivariable adjusted odds ratios (OR) and 95% confidence intervals (CI) for adolescent binge drinking using multiple types of maltreatment

	Consume five or more drinks in a row at least 2–3 times per month OR (95% CI)
Maltreatment	
No maltreatment	1.0
Neglect only	1.24* (1.00, 1.51)
Physical abuse only	1.34* (1.02, 1.76)
Sexual abuse	2.26* (1.15, 4.43)
Neglect and physical abuse	1.33* (1.00, 1.77)
Neglect, physical, and sexual abuse	1.79* (1.15, 2.78)
Age at Wave 1	
18–21	1.0
15–17	0.57* (0.46, 0.70)
12–14	0.16* (0.11, 0.22)
Sex	
Female	1.0
Male	1.88* (1.53, 2.31)
Race/ethnicity	
Non-Hispanic White	1.0
Non-Hispanic Black	0.52* (0.34, 0.79)
Hispanic	0.87 (0.63, 1.18)
Asian	0.43* (0.21, 0.91)
Other	0.73 (0.32, 1.64)
Parental alcoholism	
No	1.0
Yes	1.43* (1.30, 1.53)

* $p<0.05$.

4. Discussion

Research studies identifying risks for adolescent binge drinking have found a myriad of contributors ranging from genetic influences to environmental risk factors (Enoch, 2006). The current study found that childhood maltreatment is a robust risk factor for adolescent binge drinking. However, when the traditional method of maltreatment classification, where an individual is classified as ever experiencing one type of maltreatment, was used, childhood maltreatment was not associated with adolescent binge drinking, whereas childhood maltreatment was strongly associated with adolescent binge drinking when the co-occurrence of multiple categories of maltreatment was included. This finding indicates that further research is warranted to investigate the effects of different types of or combinations of types of maltreatment on adolescent risky drinking.

Given that maltreatment types often co-occur, emerging investigations have examined the cumulative impact of multiple types of childhood maltreatment on a variety of developmental outcomes. Theses studies have found greater developmental difficulties, including emotional or behavioral problems, and lowered social competence and self-esteem, as the number of maltreatment types increases (Higgins and McCabe, 2000; Lau et al., 2005; Rossman, Hughes, & Hanson, 1998). The current study extends past work by suggesting the effects of multicategory maltreatment on adolescent binge drinking. Given that risk factors are likely to cluster in the same individuals (Masten & Coatsworth, 1998), researchers examining the relationship between childhood maltreatment and risky alcohol use in adolescence should simultaneously consider all types of childhood maltreatment to address the totality of the child's experience.

Not surprisingly, parental alcoholism was strongly associated with adolescent binge drinking. In the final model (Table 3), parental alcoholism was associated with a 1.43-fold (OR 95% CI: 1.30–1.53) increase in risk for subsequent offspring binge drinking in adolescence. In addition, using a nationally representative community sample, we found that childhood maltreatment is associated with adolescent binge drinking, controlling for parental alcoholism. This finding is consistent with prior research (e.g., Dube et al., 2002; Harter, 2000).

This study had several limitations. First, because retrospective reports of childhood maltreatment were used, it is possible that retrospective cognitive interpretations of the tragic events might result in over- or under-reporting of child maltreatment. Second, the Add Health only focused on the parent or caregiver as the source of the maltreatment. In addition, only one aspect of child maltreatment, types of maltreatment, was used. Future studies examining the relationship between child maltreatment and adolescent binge drinking need to include other perpetrators and other aspects of maltreatment such as frequency, severity, and chronicity. Despite these limitations, this study adds important knowledge to alcohol and maltreatment research. Examining the negative effects of

childhood maltreatment on alcohol use and dependence, the co-occurrence of different categories of maltreatment should be considered.

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