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The Impact of Abuse Trauma on Alcohol and Drug Use: A Study of High-Risk Incarcerated Girls*

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Abstract

This study examines the impact of abuse trauma (physical and sexual) on alcohol and drug use of high-risk girls (12–18 years of age) who were surveyed within the first two weeks of their incarceration. One-way ANOVA analyses and Tukey post-hoc tests indicate physical abuse with a weapon was associated with higher marijuana use and number of drugs used. Sexual abuse, especially within the past year increased marijuana use, alcohol use, number of drugs used, and alcohol and other drug (AOD) problems. Policy implications reflect the need for treatment protocols within substance abuse programs to address abuse trauma, particularly, forced sex which has occurred within the last year.

Keywords

physical abuse; sexual abuse; abuse trauma; substance abuse; high-risk girls

Childhood for many is a time of play and carefree exploration; for others, their childhood is marred by the trauma of physical and sexual abuse. The Office of Juvenile Justice and Delinquency Prevention (OJJDP, 2012) reports that nearly one-half of youth were assaulted last year, one in ten was injured due to assault, and one in sixteen was victimized sexually. Abuse trauma in childhood and adolescence has a long-term impact on the quality of one's life (Corso, Edwards, Fang, & Mercy, 2008; Smith, Ireland, & Thornberry, 2005). Subsequently, these victimized youth may turn to alcohol and drugs in an attempt to cope with the trauma of their abuse.

It is generally accepted today that children who are exposed to violence are more likely to use drugs and alcohol (OJJDP, 2012). This is especially prevalent among high-risk youth populations. What is unclear, however, is the impact of the timing of the abuse. That is, does physical or sexual abuse ever in one's life have the same impact on substance abuse as

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physical or sexual abuse that is more recent? Additionally, one must question whether all forms of abuse have the same impact on substance abuse or is sexual abuse more harmful than physical abuse. Thus, the purpose of this study is two-fold. First, we examine the impact of abuse trauma (physical and sexual) on alcohol and drug use of high-risk girls who recently have been incarcerated, and second, we examine whether that abuse is more harmful if it is recent (that is, within the previous year) than in the past.

Abuse Trauma

According to results from the National Crime Victimization Survey (NCVS), violent crime against youth ages 12 to 17 declined dramatically between 1994 and 2010. Serious violent crime (including rape or sexual assault, robbery, and aggravated assault) declined by 77%, with rape or sexual assault specifically experiencing a 68% decline, while simple assault declined by 83% (White & Lauritsen, 2012). Since the male youth rate of victimization declined more than that for female youth, in 2010 there was little difference in their overall victimization rates for serious violent crime (14.3 per 1,000 male youth and 13.7 per 1,000 female youth) or for simple assault (24.8 per 1,000 male youth and 18.3 per 1,000 female youth) (White & Lauritsen, 2012). While these trends seem promising, they still reflect the fact that nearly 1 million youth between the ages of 12 and 17 were the victims of a violent crime in 2010 (White & Lauritsen, 2012).

The trauma from physical and sexual abuse experienced by youth has multiple origins, with one of the most assaultive being the institution of the family (Low & Mulford, 2013). In 2011, just over 3 million (unique count) children (41.2 per 1,000 children) were investigated by Child Protective Services (CPS) agencies or received an alternative response disposition due to suspected child abuse or neglect (U.S. Department of Health and Human Services [U.S. DHHS], 2012). Of this number, there was a unique count of 676,569 children (9.1 per 1,000 children) receiving formal intervention for abuse and neglect (U.S. DHHS, 2012). As expected, neglect is the most common form of abuse (78.5%), followed by physical abuse (17.6%) and sexual abuse (9.1%) (U.S. DHHS, 2012). Those victims of sexual abuse are more often in the 12–14 years of age (26.3%) and the 15–17 years of age (21.8%) ranges (U.S. DHHS, 2012), with girls, more often than boys, experiencing the trauma of rape and sexual abuse (Hennessey, Ford, Mahoney, Ko, & Siegfried, 2004). It is understood that child sexual abuse, especially, creates psychological and behavioral difficulties felt long into adulthood (Abdulrehman & De Luca, 2001). Resulting challenges include depression (Molnar, Buka, & Kessler, 2001), posttraumatic stress disorder (Widom, 1999), risky sex (Banducci, Hoffman, Lejuez, & Koenen, 2014), suicide attempts (Harford, Hsiao-ye, & Grant, 2014), alcohol-related problems (Klamecky & McChargue, 2013; Smith, Smith, & Grekin, 2014), and substance abuse (Herrenkohl, Seunghye, Klika, Herrenkohl, & Russo, 2013; Molnar, Buka, & Kessler, 2001). A wider range of these psychological and behavioral difficulties are reported by female victims of childhood sexual abuse than by male victims (Molnar, Buka, & Kessler, 2001).

While often most feared, a typically rare type of youth victimization is by the stranger perpetrator (Hamby, Finkelhor, & Turner, 2013). Stranger victimization of youth has also decreased dramatically in recent years. “The rate of serious violent crime against youth

committed by strangers declined by 84% from 1994 to 2010 and simple assault by strangers declined by 76%” (White & Lauritsen, 2012, p. 12). Overall, youth are at higher risk of victimization from people they know than from strangers. The NCVS indicates that in 2010, for serious violent crimes there were 8.9 per 1,000 youth nonstranger victimizations compared to 4.5 per 1,000 youth stranger victimizations, while for simple assault there were 12.2 per 1,000 youth nonstranger victimizations compared to 8.3 per 1,000 youth stranger victimizations. Thus, we may conclude that while youth are at lower risk for physical and sexual abuse trauma today than they have been in the past two decades, they continue to be a target for physical and sexual abuse, especially by people they know.

A third source of abuse trauma for youth is the interpersonal violence that occurs with their peers. While Lowry, Sleet, Duncan, Powell, and Kolbe concluded in 1995 that “youth are disproportionately represented among both victims and perpetrators of violence” (p. 34), between 1994 and 2010 the rate of serious violent victimization of youth declined for offenses occurring both on school grounds and at non-school locations. Violent victimizations at school, however, declined at a much lower rate (62%) than did those away from school (83%) (White & Lauritsen, 2012) indicating ongoing peer violence at school (Card & Hodges, 2008). While completing state-mandated schooling, teens also initiate intimate relations with their peers – another source of abuse trauma, especially for girls. Female youth report a higher rate of serious violent victimization by their intimate (1.5 per 1,000) than do male youth (0.1 per 1,000) (White & Lauritsen, 2012). Additionally, reflective of the prevalence of date and acquaintance rape, the NCVS identifies the 12–17 year age range for females as having the highest rate of rape and sexual assault victimization (4.1 per 1,000) (Planty, Langton, Krebs, Berzofsky, & Smiley-McDonald, 2013). It is apparent, then, that peers and intimates are also sources of abuse trauma, especially for females 12–17 years of age.

For our study, it is important to note that not all youth (or even all females specifically) are equally at risk for physical or sexual abuse; that is, some are at high-risk. While overall violence against youth has dropped substantially over the past 20 years as noted above, females in the juvenile justice system have not benefited from these dramatic declines. An estimation of up to 85% of women in the criminal justice system have experienced abuse trauma with a significant number of men in the system reporting physical and sexual victimizations also (Gillece, 2009, p. 48). Specifically, girls in the juvenile justice system are more likely to experience a history of abuse and neglect than girls not involved in the juvenile justice system (Berlinger and Elliot, 2002). Thus, it is of particular importance to identify the abuse trauma experienced by these high-risk girls in an effort to estimate its impact on their behavior.

Substance Abuse

As seen with rates of youth physical and sexual abuse, overall delinquency rates have declined in recent years as well (Knoll & Sickmund, 2012). While there has been extensive literature on causal factors for declining male delinquency (see for example, Casey, Beadnell, & Lindhorst, 2009; Ge, Donnellan, & Wenk, 2001; Wikström & Loeber, 2000), ironically, girls are increasingly becoming more involved in the juvenile justice system. As

noted by Cauffman (2008), in 1980, males were four times as likely to be arrested for delinquency; today they are only twice as likely. Specifically, high-risk girls are actually making up a growing proportion of offenders in general (19% in 1995, but 28% in 2009) and maintaining their level of drug offending (17% in 1995, but 18% in 2009) (Knoll & Sickmund, 2012, p.2). In an effort to better understand delinquency, Zahn et al. (2010) conducted an extensive review of over 1,600 articles and book chapters, but even they admit the causal factors for girls' delinquency remains unclear.

Substance abuse among teens also has been lower in the past decade (Williams et al., 2008), with the exception of marijuana use which has seen a rise in use during the past five years (National Institute on Drug Abuse [NIDA], 2012; Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). In addition, alcohol use among teens is lower than in recent years (NIDA, 2012). However, substance use by girls who have experience with the juvenile justice system remains high. A review of the literature by Roberts-Lewis, Welch-Brewer, Jackson, Kirk, and Pharr (2010) finds rates of substance disorders among samples of incarcerated girls range between 60% and 87%. Alcohol or drug abuse was especially apparent in the year prior to their detention. Clearly, it is critical to better understand why girls in general, and high-risk girls specifically, continue to report high rates of substance abuse.

Physical versus Sexual Abuse Trauma and Substance Abuse

Research has examined the impact of abuse trauma on substance use in adults in general (Afifi, Henriksen, Asmundson, & Sareen, 2012; Medrano, Hatch, Zule, & Desmond, 2002), adults in a treatment program (Brems, Johnson, Neal, & Freemon, 2004; Wu, Schairer, Dellor, & Grella, 2010), adult women specifically (Goldberg, 1995; Rodgers et al., 2004), and adult women who are in a treatment program (Golder & Logan, 2011; Hequembourg, Mancuso, & Miller, 2006; Newmann & Sallmann, 2004; Sacks, McKendrick, & Banks, 2008; Savage, Quiros, Dodd, & Bonavota, 2007) or who are incarcerated (Bowles, DeHart, & Webb, 2012; Mullings, Hartley, & Marquart, 2004, alcohol use only). Previous research has also looked at abuse trauma and substance use in adolescents in general (Danielson et al., 2009; Mersky, Topitzes, & Reynolds, 2012; Smith & Thornberry, 1995; Smith et al., 2005; Thornberry, Ireland, & Smith, 2001), adolescents in a treatment program (Hawke, Jainchill, & De Leon, 2000, sexual abuse only; Jaycox, Ebener, Damesek, & Becker, 2004; Oshri, Tubman, & Burnette, 2012), and incarcerated adolescents (Dembo, Schmeidler, & Childs, 2007; Dembo et al., 1988; Ford, Hartman, Hawke, & Chapman, 2008). However, scholars are still working to clarify the causal link between abuse trauma and substance use for high-risk girls, especially those not specifically in a substance abuse program.

While Cauffman (2008) found male exposure to violence was due to witnessing a violent event, female exposure was due to their actually being the victim of physical or sexual abuse. In general, "being abused or neglected as a child increased the likelihood of arrest as a juvenile by 59[%];" while more specifically, female victims of childhood abuse trauma were 73% more likely than their control group of females to be arrested for various property, substance abuse, and misdemeanor offenses (Widom & Maxfield, 2001, pp. 1–3).

Researchers have found mixed results as to whether physical abuse or sexual abuse is more likely to lead to alcohol and drug use. While Brems et al. (2004) found a history of abuse was associated with earlier age of onset of drinking, irrespective of gender, Hyman, Garcia, and Sinha (2006) found a gender difference. In men, emotional abuse was associated with a younger age of alcohol use and more severe substance abuse, yet in women, a broader range of abuse and stronger associations were identified. In women, “sexual abuse, emotional abuse, and overall maltreatment was associated with a younger age of first alcohol use, and emotional abuse, emotional neglect, and overall maltreatment was associated with a greater severity of substance abuse” (Hyman et al., 2006, p. 655). While Widom, Ireland, and Glynn (1995) focus specifically on the impact of childhood abuse trauma on adult alcohol abuse, they, too, found mixed results: childhood trauma led to alcohol abuse in women, but not in men. Utilizing samples of teens, Hawke et al. (2000) find those with a history of sexual abuse were more likely to report alcohol and drug use at an earlier age, but Kingston and Raghaven (2009) did not find that an earlier age of first substance use was due to child sexual abuse. For Smith and Saldana (2013), sexual abuse was associated with girls’ use of substances, while physical abuse was not. Finally, Siegel and Williams (2003) found that while girls who experienced child sexual abuse did not have increased rates of juvenile drug arrests, they did have higher adult drug arrests. Irrespective of the type of trauma experienced, it is important to note, as Newmann and Sallmann (2004) and Sacks et al. (2008) do, that in those who have a history of childhood abuse, their adult substance abuse problems could be more difficult to treat. As Rosen, Ouimette, Sheikh, Gregg, and Moos (2002, p. 683) state, “[i]ndividuals with substance use disorders who have a history of physical or sexual abuse may have higher risk for problematic treatment outcomes as a result of greater psychiatric problems, deficits in social support and possible difficulties in establishing treatment alliance.”

Some of the challenges faced when studying this topic are due to the lack of a clear path between childhood abuse and substance use problems. Some studies report limitations due to the way abuse is measured. For example, Lo and Cheng (2007) examine the impact of abuse experienced between 10 and 17 years of age on young adults’ substance use by utilizing the first 5 waves and the 7th wave of the National Youth Survey (NYS). Interestingly, while physical abuse was a strong predictor of substance use, sexual abuse was not. The authors comment on the limited indicator of sexual abuse due to the availability of a single self-report item of “being the subject of a sexual attack” during the first 5 waves of the survey (Lo & Cheng, 2007, pp. 141 & 144). Other studies question the temporal connection between trauma and substance use as stated by Savage et al. (2007) who found only a modest link between abuse and drug use and no link between abuse and alcohol use.

The Timing of Abuse Trauma and Substance Abuse

As noted by Ireland, Smith, and Thornberry (2002), a number of studies in the 1990s concluded that any maltreatment of youth in their first 18 years of life was associated with increased drug use (see, for example, Dembo, Williams, Wothke, Schmeidler, & Brown, 1992; Ireland & Widom, 1994; and Smith & Thornberry, 1995). More recently, Ullman, Relyea, Peter-Hagene, and Vasquez (2013) “found that a higher degree of lifetime trauma exposure and sexual abuse severity in childhood were each associated with a greater use of

substances to cope” (p. 2222). Ballon, Courbasson, and Smith (2001) report a gender difference among the youth in their sample with 64.7% of females versus 37.9% of the males reporting turning to substances to cope with the abuse. What remains unclear, however, is the impact of the timing of the abuse and any gender differences in the impact of physical versus sexual abuse. “Although not denying the importance of early childhood experiences,... [it is possible] that more proximal events in the life course may be more salient than distal experiences that occur in early childhood” (Ireland et al., 2002, p. 362). As Thronberry et al. (2001, p. 957) suggest, “adolescent and persistent maltreatment have stronger and more consistent negative consequences during adolescence than does maltreatment experienced only in childhood.” Indeed, Ireland et al. (2002) found that childhood-only maltreatment had no significant impact on drug use. It was adolescent-only maltreatment or childhood maltreatment that persists into adolescence that was related to drug use. Interestingly, Schumacher, Coffey, and Stasiewicz (2006) find the opposite outcome with alcohol. Early childhood trauma increased alcohol dependence more than if their first traumatic event occurred in adolescence. Noting this exception, many researchers conclude that the long-term impact of adolescent maltreatment can be felt later in the life course (Smith et al., 2005) and lead to more substance use problems in adulthood (Rodgers et al., 2004).

While Hubbard and Pratt (2002) concede many factors like a history of antisocial peers, behaviors, and attitudes impact males and females alike, of major importance for females is family relationships and rates of physical and sexual assault. Cauffman (2008) states that while evidence is mixed as to when males and females are most likely to start offending, victimization is a stronger predictor for females; “female offenders typically are abused before their first offense” (p. 130). Important for our paper is Hubbard and Pratt’s (2002) conclusion that correctional treatment programs must target criminogenic needs, and for females we can see this includes their history of physical and sexual abuse trauma.

Both Jaycox et al. (2004) and Williams et al. (2008) found youth experiencing high levels of trauma will benefit from substance abuse treatment programs. As Gillece (2009), Jennings (2004), and Roe-Sepowitz, Pate, Bedard, and Greenwald (2009) note, by recognizing the trauma histories of individuals in the criminal justice system, we can better assist them in developing the capacity to self-regulate, thus breaking the cycle of substance abuse, arrest, and subsequent reincarceration. However, we require a greater awareness of gender-specific needs to reduce the impact of abuse trauma on high-risk female substance abuse (Jennings, 2004; Salter & Breckenridge, 2014; Welch, Roberts-Lewis, & Parker, 2009). This can happen with the development of gender-specific treatment programs within juvenile detention facilities (Sherman, 2005).

Hypotheses

The purpose of this paper is to examine the impact of abuse trauma (physical and sexual) on substance abuse and related problems. We attempt to clarify not only whether past abuse or abuse within the last year is more associated with substance abuse, but also whether physical abuse and sexual abuse have the same impact on substance abuse. In addition, we utilize a sample of incarcerated girls who, as identified in the literature, are at high-risk for both

abuse trauma and substance abuse problems. Thus, we expect significant differences between girls who have not experienced abuse trauma, girls who have experienced past abuse (prior to the last year), and girls who have experienced recent abuse (within the year) relating to the following four substance use items: frequency of using marijuana, frequency of using alcohol, number of drugs used, and having alcohol and other drug related problems. We hypothesize that the more recent the abuse, the more alcohol and drug problems will be reported. Finally, we hypothesize that sexual abuse will be associated with more alcohol and drug problems than will physical abuse.

Method

Data

The data were collected from September 2004 through June 2006 from 333 adolescent girls in a state reformatory or training school. Our sample consisted of 328 girls, 12–18 years of age (mean age of 15.1 years; SD = 1.3), who had no missing data of interest. All participants were approached within the first two weeks of their admission and asked to recall substance use activity from six months prior to incarceration. Thus, all participants recalled from the same time period give or take two weeks. To accommodate low literacy rates, the data were collected in a private location utilizing audio computer-administered interview technology. This type of survey method has been shown to result in higher reporting rates for sensitive drug-use and sexual behavior when compared to face-to-face interviews (Des Jarlais et al., 1999). Since most subjects (61.9%) had repeated a grade in school, this technique was warranted. The protocol for this study was approved by the Institutional Review Board at Mississippi State University and the Federal Office of Human Research Protection Panel on Prisoners.

Measures

Dependent variables—Participants were asked about use of the following drugs during the six months prior to incarceration: tobacco, marijuana, inhalants, hallucinogens, cocaine, alcohol or other drugs. For the variable *Number of Drugs*, an index of substance use was created by summing the number of different drugs reported ($\alpha = .74$). Participants were asked the frequency of marijuana and alcohol use (*Marijuana Use* and *Alcohol Use*). Response choices for drug frequency were every day, several times a week, one or two times a week, one or two times a month, at least once, and never. In addition, there were six questions on alcohol and other drug problems (*AOD Problems*): getting into trouble with parents because of drinking or drug use, having problems with friends because of drinking or drug use, doing something under the influence that was later regretted because of drinking or drug use, unplanned sexual situation because of drinking or drug use, getting sick because of drinking or drug use, and getting into physical fights because of drinking or drug use. The response options were never (0), once (1), twice (2), three or four times (3), and five or more times (4). Scores range from zero to 24 with higher scores indicating greater problems associated with alcohol and drug use. The reliability of the AOD Problems scale was acceptable ($\alpha = .76$).

Independent variables—Our independent variables came from the Unwanted Childhood Sexual Experiences Questionnaire by Stevenson and Gajarsky (1992). It consists of 13 items that document the age and extent of respondents' unwanted childhood sexual experiences. Physical abuse history items came from the Prototype Screening/Triage form by the Center for Substance Abuse Treatment (1994) for use in juvenile detention centers. The physical abuse section of the form has six yes/no questions about physical abuse, and if it happened in the last year. The questions used were as follows: Have you been beaten or really hurt by being hit by fists or kicked? (*Hurt by Fists/Kicked*) Have you been shot with a gun, stabbed or cut with a knife, or had some other weapon used against you? (*Hurt by Weapon*) Has someone touched your vagina when you did not want it? (*Unwanted Touches*) Have you been forced to have sex? (*Forced Sex*).

Analyses

The analyses conducted were One-Way Analysis of Variance (ANOVA) and Tukey post-hoc tests. These procedures allow for a comparison of substance use across girls who have never been abused, girls who ever have been abused, and girls who have been abused within the previous year.

Results

The percent of participants reporting alcohol and drug use in the six months prior to incarceration is shown in Table 1. As would be expected, marijuana use, alcohol use, and tobacco use are the most common substances used by this sample. The average number of drugs used overall was 2.4 (mode = 3; S.D. = 1.88; range = 7). Most participants reported problems related to their use of alcohol and drugs: 29.9% reported no problems (scored zero), 22% reported few problems (scored 1 to 3), but 48.1% scored 4 or higher indicating that their use of alcohol or other drugs was causing interpersonal and health problems. As reported in Roberts-Lewis et al.'s (2010) literature review, 60% to 87% of incarcerated girls report substance disorders. While our sample of girls report use rates for marijuana, alcohol, and tobacco between 63.3% to 64.3%, about one-half of them (48.1%) report various alcohol and other drug problems.

We assess study participants' exposure to violence by asking about their history of physical and sexual victimization. As seen in Table 2, a substantial percent of study participants has a history of victimization. About 10% of the sample reported having been hit or kicked, as well as having had a weapon used against them. When looking at physical abuse within the past year these numbers increase to nearly 19% and 14% respectively. Compared to national rates of serious violent crime for males and females (1.43% or 14.3 per 1000 male youth and 1.37% or 13.7 per 1,000 female youth) presented by White & Lauritsen (2012) earlier in the paper, our sample reports much higher rates of physical abuse. What might be surprising is more girls in our sample reported sexual abuse in the past than physical abuse (just under 20% reported unwanted touches both ever and within the past year, as well as about 13% reported forced sex ever and nearly 17% reported forced sex within the past year). While Planty, et al. (2013) report 12–17 year-olds are at highest risk for rape and sexual assault (.

4% or 4.1 per 1,000), we see the girls in this sample reported much higher rates of sexual abuse.

To compare across our groups of girls on their experience with physical and sexual abuse ever or within the past year, we utilized One-Way Analysis of Variance and the Tukey post-hoc test as our statistical methods. For marijuana use, there was a statistically significant difference between groups who were hurt by a weapon ($F = 7.684, p = .001$), experienced unwanted touches ($F = 7.194, p = .001$), and experienced forced sex ($F = 5.403, p = .005$) as determined by one-way ANOVA (see Table 3). In Table 4, a Tukey post-hoc test revealed that the frequency of using marijuana was significantly higher for girls who experienced being hurt by a weapon in the past (3.177 ± 1.98 min, $p = .006$) and within the last year (2.935 ± 2.02 min, $p = .015$) compared to those who had never been hurt by a weapon (2.036 ± 2.01 min). There was no statistically significant differences between girls who experienced being hurt by a weapon in the past or within the last year ($p = .855$). The frequency of using marijuana was significantly higher for girls who experienced unwanted touches in the past (2.641 ± 2.11 min, $p = .047$) and within the year (2.952 ± 2.00 min, $p = .002$) compared to those who had never had unwanted touches (1.955 ± 1.98 min). There was no statistically significant differences between girls who experienced unwanted touches in the past or within the year ($p = .657$). Using marijuana more frequently was significantly higher for girls who experienced forced sex within the year (2.964 ± 2.02 min, $p = .008$) compared to girls who never experienced forced sex (2.048 ± 1.98 min). There was no statistically significant differences between girls who never experienced forced sex and girls who experienced forced sex in the past ($p = .171$) or for girls who experienced forced sex in the past or within the year ($p = .727$). These findings support our hypotheses that abuse trauma would be associated with marijuana use. Findings indicate that experiencing abuse within the last year and experiencing sexual abuse have the stronger effects.

When considering alcohol use, there was a statistically significant difference between groups who were hurt by a weapon ($F = 4.352, p = .014$), experienced unwanted touches ($F = 8.050, p = .000$), and experienced forced sex ($F = 7.046, p = .001$) as determined by one-way ANOVA (see Table 3). In Table 4, a Tukey post-hoc test revealed that the frequency of using alcohol was significantly higher for girls who experienced unwanted touches in the past (2.063 ± 1.57 min, $p = .002$) and within the year (1.921 ± 1.57 min, $p = .015$) compared to those who had never had unwanted touches (1.318 ± 1.45 min). There was no statistically significant differences between girls who experienced unwanted touches in the past or within the year ($p = .854$). Drinking alcohol more frequently was significantly higher for girls who experienced forced sex within the year (2.164 ± 1.63 min, $p = .002$) compared to girls who never experienced forced sex (1.383 ± 1.46 min). There was no statistically significant differences between girls who never experienced forced sex and girls who experienced forced sex in the past ($p = .111$) or for girls who experienced forced sex in the past or within the year ($p = .630$). Findings indicate that physical abuse has no impact on alcohol use, but sexual abuse does as hypothesized. There is no difference between the timing of the abuse (ever or past year) for unwanted touches; however, forced sex within the last year does impact alcohol use when compared to girls who have never been abused. Therefore, our hypotheses concerning timing of abuse was partially supported. For the number of drugs used, there was a statistically significant difference between groups who were hurt by fists/

kicked ($F = 4.864, p = .008$), hurt by a weapon ($F = 6.529, p = .002$), experienced unwanted touches ($F = 6.829, p = .001$), and experienced forced sex ($F = 9.883, p = .000$) as determined by one-way ANOVA (see Table 3). In Table 4, a Tukey post-hoc test revealed that the number of drugs used was significantly higher for girls who experienced being hurt by fists/kicked within the year ($2.887 \pm 2.27, p = .041$) compared to girls who have never been hurt by fists/kicked (2.242 ± 1.71 min). There was no statistically significant differences between girls who never were hurt by fists/kicked and girls who were hurt by fists/kicked in the past ($p = .052$) or for girls who were hurt by fists/kicked in the past or within the year ($p = .931$). The number of drugs used was significantly higher for girls who experienced being hurt by a weapon in the past ($3.235 \pm 1.79, p = .010$) and within the year ($2.978 \pm 1.89, p = .036$) compared to those who had never been hurt by a weapon (2.242 ± 1.85 min). There was no statistically significant differences between girls who experienced being hurt by a weapon in the past or within the last year ($p = .812$). The number of drugs used was significantly higher for girls who experienced unwanted touches in the past (2.891 ± 1.95 min, $p = .015$) and within the year (2.952 ± 1.84 min, $p = .008$) compared to those who had never had unwanted touches (2.150 ± 1.81 min). There was no statistically significant differences between girls who experienced unwanted touches in the past or within the year ($p = .981$). Using a greater number of drugs was significantly higher for girls who experienced forced sex within the year (3.328 ± 1.97 min, $p = .000$) compared to girls who never experienced forced sex (2.170 ± 1.74 min). There was no statistically significant differences between girls who never experienced forced sex and girls who experienced forced sex in the past ($p = .087$) or for girls who experienced forced sex in the past or within the year ($p = .353$). These findings support our hypotheses that abuse trauma would be associated with the number of drugs used. Findings indicate that experiencing abuse within the last year and experiencing sexual abuse have the stronger effects.

For alcohol and other drug (AOD) related problems, there was a statistically significant difference between groups who were hurt by fists/kicked ($F = 5.248, p = .006$), hurt by a weapon ($F = 3.402, p = .035$), experienced unwanted touches ($F = 7.457, p = .001$), and experienced forced sex ($F = 11.980, p = .000$) as determined by one-way ANOVA (see Table 3). In Table 4, a Tukey post-hoc test revealed that AOD problems were significantly higher for girls who experienced being hurt by fists/kicked within the year ($6.565 \pm 6.68, p = .008$) compared to girls who have never been hurt by fists/kicked (4.255 ± 4.85 min). There was no statistically significant differences between girls who never were hurt by fists/kicked and girls who were hurt by fists/kicked in the past ($p = .225$) or for girls who were hurt by fists/kicked in the past or within the year ($p = .806$). AOD problems were significantly higher for girls who experienced unwanted touches in the past (5.860 ± 6.17 min, $p = .038$) and within the year (6.651 ± 5.74 min, $p = .002$) compared to those who had never had unwanted touches (3.986 ± 4.85 min). There was no statistically significant differences between girls who experienced unwanted touches in the past or within the year ($p = .678$). AOD problems were significantly higher for girls who experienced forced sex within the year (7.873 ± 6.20 min, $p = .000$) compared to girls who never experienced forced sex (4.057 ± 4.86 min). AOD problems were also significantly higher for girls who experienced forced sex within the year (7.873 ± 6.20 min, $p = .000$) compared to girls who experienced forced sex in the past (5.326 ± 5.85 min, $p = .046$). There was no statistically significant differences between girls

who never experienced forced sex and girls who experienced forced sex in the past ($p = .312$). However, timing is especially important for girls who have experienced forced sex within the last year. Thus, our hypothesis regarding the timing of the abuse is supported with the more recent abuse being associated with more substance abuse problems. Considering physical abuse, being hurt by fists/kicked within the last year was associated with AOD problems as compared to girls who did not experience being hurt by fists/kicked.

Discussion

Even though substance abuse in youth has declined in recent years (with the exception of marijuana use), high-risk females comprise a growing percentage of offenders and are reporting increased alcohol and drug use. One factor associated with higher rates of substance abuse in youth is a history of abuse trauma. Again, the impact of physical and sexual victimization is more apparent in females and particularly those who are at high-risk. This is especially true for high-risk females who were sexually abused within the previous year.

Like Savage et al. (2007) we want to clarify the temporal connection between the abuse trauma and substance use. Supporting the findings of Thornberry et al. (2001) and Smith et al. (2005), the timing of the abuse trauma within the last year is most important when compared to girls who have never been abused. This was especially true when considering the impact of sexual abuse on the number of drugs used and AOD problems. That is, when comparing substance use and related problems of girls who have never been abused with those who had been abused, the recently abused girls reported more substance use and AOD related problems.

Our findings regarding the impact of physical versus sexual abuse are mixed, just as other researchers have found (see, for example, Hyman et al., 2006 or Widom et al., 1995). While physical abuse ever and within the past year increases marijuana use, the number of drugs used, and to a lesser extent AOD problems; it has no impact on alcohol use. It is possible that the growing normative use of alcohol would be less likely to fluctuate due to outside factors, such as physical abuse, than would other substances falling out of normative favor. Finally, sexual abuse, especially within the past year, is associated with increases in all substance use and related problems. Interestingly, the only significant comparison between girls who experienced abuse in the past versus within the last year is forced sex and AOD problems. Quite possibly this reflects the broad effect recent sexual abuse has on the girls' behavior.

Limitations of the Study

There are limitations to the study, namely findings are restricted by the validity of self-reported measures from high-risk girls and findings may not generalize to other female adolescents or to male juvenile offenders. While the goal of this research was to examine this high-risk population of girls, future research with assorted adolescent populations can validate and extend this study. In addition, we are limited in our measure of the timing of the abuse to ever and within the past year. Like Lo and Cheng (2007), we are limited by the types of indicators we could use for physical and sexual abuse. Finally, we include abuse;

however, are unable to identify the relationship between the abuser and our subjects. Regardless of these limitations, our findings have significant implications for alcohol and drug abuse prevention.

Policy Implications

In support of both Jaycox et al. (2004) and Williams et al. (2008) who found it beneficial for youth in substance abuse treatment programs to address their trauma issues, this study highlights the importance of addressing childhood abuse trauma in any alcohol and substance abuse program. This is especially important if the abuse trauma is recent since as we (as well as Ireland et al., 2002 and Throneberry et al., 2001) found, the timing of the abuse is significant. As noted by Gillece (2009), recognizing abuse histories of high-risk populations is an important step in enabling them to finally address their substance abusing behaviors. Whether youth use alcohol and drugs to cope with the trauma of the abuse (as noted by Ballon et al., 2001 and Ullman et al., 2013) or to increase self-esteem, reduce feelings of isolation, or as a form of self-medication (as suggested by Widom et al., 1995), the indication is that treatment programs should benefit by addressing issues of abuse.

As we found, recent abuse trauma, especially of a sexual nature, must be addressed for high-risk incarcerated girls if the goal is to reduce their alcohol and drug abuse. Many juvenile and adult state drug courts are underfunded and often there are not enough resources to spend on physical and sexual abuse trauma. However, the importance of identifying and addressing the needs of incarcerated adolescent victims of abuse should not be ignored. This gender specific treatment of childhood abuse trauma (as urged by Salter and Breckenridge, 2014) should be done without undermining alcohol and other drug preventions as that is critical for this population of high-risk girls.

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Table 1

Participants' Reporting of Alcohol and Drug Use, N = 328

Drug	Any Use	Once	1-2/Mo.	1-2/Wk.	Several/Wk.	Everyday
Marijuana	64.3%	8.5%	7.9%	10.7%	14.3%	22.9%
Alcohol	63.1%	14.6%	19.2%	15.9%	9.8%	3.7%
Tobacco	63.9%					
Inhalants	9.0%					
Hallucinogens	12.7%					
Cocaine	17.7%					
Other Drugs	15.1%					
Average # of Drugs Used	2.4					
AOD Problems						
No Problems	29.9%					
Few Problems	22.0%					
Many Problems	48.1%					

Note: Information on the frequency of drug use was collected for marijuana and alcohol only.

Table 2

Percent of Participants Reporting Physical and Sexual Abuse Trauma, N = 328

	% Past Abuse	% Abuse within Year
Physical Abuse		
Have you been beaten or really hurt by being hit by fists or kicked?	10.7	18.9
Have you been shot with a gun, stabbed or cut with a knife, or had some other weapon used against you?	10.4	14
Sexual Abuse		
Has someone touched your vagina when you did not want it?	19.5	19.2
Have you been forced to have sex?	13.1	16.8

Table 3
ANOVA of Abuse Trauma on Alcohol and Other Drug (AOD) Use and Problems, N = 328

Independent Variables	Marijuana Use				Alcohol Use				Number of Drugs Used				AOD Problems			
	Mean	S.D.	F	r	Mean	S.D.	F	r	Mean	S.D.	F	r	Mean	S.D.	F	r
Hurt by Fists/Kicked																
No abuse	2.182	2.028	1.045	.080	1.476	1.494	1.823	.103	2.242	1.710	4.864**	.153**	4.255	4.846	5.248**	.175**
Past abuse	2.371	1.864			1.771	1.477			3.029	1.978			5.857	5.811		
Recent abuse	2.597	2.199			1.855	1.648			2.887	2.270			6.565	6.677		
Hurt by Weapon																
No abuse	2.036	2.007	7.684**	.188**	1.440	1.488	4.352**	.150**	2.242	1.846	6.529**	.171**	4.427	5.143	3.402*	.140*
Past abuse	3.177	1.977			2.030	1.487			3.235	1.793			5.971	6.008		
Recent abuse	2.935	2.016			2.000	1.647			2.978	1.891			6.391	6.053		
Unwanted Touches																
No abuse	1.955	1.978	7.194**	.203**	1.318	1.445	8.050***	.187**	2.150	1.813	6.829**	.188**	3.986	4.852	7.457**	.206**
Past abuse	2.641	2.111			2.063	1.572			2.891	1.945			5.860	6.167		
Recent abuse	2.952	1.995			1.921	1.569			2.952	1.844			6.651	5.742		
Forced Sex																
No abuse	2.048	1.979	5.403**	1.78**	1.383	1.46	7.046**	.202**	2.170	1.736	9.883***	.239**	4.057	4.855	11.980***	.259**
Past abuse	2.651	2.224			1.884	1.531			2.814	2.107			5.326	5.854		
Recent abuse	2.964	2.018			2.164	1.63			3.328	1.973			7.873	6.198		

* p<.05;

** p<.01;

*** p<.001

Table 4

Tukey Post-hoc Test on One-way ANOVA of Abuse Trauma on Alcohol and Other Drug (AOD) Use and Problems, N = 328

Independent Variables	Comparison Groups	Marijuana Use	Alcohol Use	Number of Drugs	AOD Problems
Physical Abuse					
Hurt by Fists/Kicked	No abuse vs. Past abuse	.866	.534	.052	.225
	No abuse vs. Within year	.333	.192	.041 *	.008 **
	Past abuse vs. Within year	.861	.964	.931	.806
Hurt by Weapon	No abuse vs. Past abuse	.006 **	.085	.010 *	.260
	No abuse vs. Within year	.015 *	.056	.036 *	.060
	Past abuse vs. Within year	.855	.996	.812	.936
Sexual Abuse					
Unwanted Touches	No abuse vs. Past abuse	.047 *	.002 **	.015 *	.038 *
	No abuse vs. Within year	.002 **	.015 *	.008 **	.002 **
	Past abuse vs. Within year	.657	.854	.981	.678
Forced Sex	No abuse vs. Past abuse	.171	.111	.087	.312
	No abuse vs. Within year	.008 **	.002 **	.000 ***	.000 ***
	Past abuse vs. Within year	.727	.630	.353	.046 *

* p<.05;

** p<.01;

*** p<.001