

Is substance use associated with perpetration and victimization of physically violent behavior and property offences among homeless youth? A systematic review of international studies.

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Abstract

Background. Substance use is a commonly reported problem associated with numerous adverse outcomes among homeless youth. Homelessness is reportedly a covariate to perpetration of, and victimization from, physically violent behavior and property offences. Of particular importance in both the perpetration of, and victimization from these behaviors, is the role of substance use.

Objective. To appraise published studies investigating whether use of substances are associated with (1) perpetration of physically violent behavior or property offences or (2) experience of physical or property victimization among homeless youth. Types and rates of substances used were also examined.

Methods. A comprehensive systematic search of twelve psychology, health, and criminology electronic databases was conducted. Search terms encompassed four areas, (1) homeless youth, (2) substance use, (3) perpetration of physically violent behavior and property offences, and (4) experience of physical and property victimization.

Results. Nine studies met the inclusion criteria. In reviewed studies, alcohol was the most commonly used substance. Findings were inconsistent as to whether substance use was associated with the perpetration of physically violent behavior or property offences or the experience of physical victimization. No reviewed studies examined whether substance use is associated with the experience of property victimization.

Conclusions. The available cross-sectional evidence, while not conclusive, suggests increased perpetration of physically violent behavior and property offences, and increased experience of physical and property victimization when youth reported using substances. Studies advancing knowledge on the influence of substance use on these behaviors and experiences are warranted.

Keywords: homelessness; substance use; physical violence; property violence; victimization;
systematic review

Introduction

Substance use is a commonly reported problem associated with numerous short- and long-term adverse health and behavioral outcomes among homeless youth. Many studies investigating the scope of substance use among these youth have shown disturbingly high rates of substance use, abuse, and dependence (Baer, Ginzler, & Peterson, 2003; Busen & Engebretson, 2008; Rosenthal, Mallett, Milburn, & Rotheram-Borus, 2008; Salomonsen-Sautel et al., 2008), repeatedly greater than rates for youth within the general population (Department of Families, 2009; Greene, Ennett, & Ringwalt, 1997; National Youth Commission, 2008; Rice, Milburn, Rotheram-Borus, Mallett, & Rosenthal, 2005). It is difficult to establish whether substance use contributes to or follows the transition to homelessness (Johnson & Chamberlain, 2008). Hence, efforts to better understand substance use among homeless youth are likely to be advanced by investigating those factors associated with homelessness which may contribute to initiation into and continued substance use. This review examines published studies investigating associations between substance use among homeless youth and their perpetration of, or victimization from, physically violent behavior or property offences.

The needs and rights of all young people are underpinned by charters such as the United Nations Convention on the Rights of the Child (Office of the United Nations High Commissioner for Human Rights [UNHCR], 1989) and the Declaration of Human Rights (Office of the United Nations High Commissioner for Human Rights [UNHCR], 1946). Young people are entitled to care and protection enabling healthy growth and development leading to the attainment of developmental tasks and leading to successful adult functioning. Homeless youth, however, have commonly not been afforded basic human rights. Studies investigating precursors to homelessness among these youth frequently demonstrate problems relating to family violence and childhood physical, emotional, and sexual abuse (Hyde,

2005), transitioning from out-of-home care settings (Heerde et al. 2012a), unemployment, and housing instability (Bearsley-Smith, Bond, Littlefield, & Thomas, 2008). Thus, homeless youth are required to find ways within which to support themselves and survive, often with the only support obtained being that from peers in analogous situations.

It is not unexpected that the health status of homeless youth is compromised, including rates of physical and psychological trauma associated with childhood abuse (e.g., post-traumatic stress disorder) (Goodman, Saxe, & Harvey, 1991; Stewart et al., 2004), substance use (including illness associated with drug-risk behaviors such as hepatitis and HIV/AIDS) (Ensign & Gittelsohn, 1998; Farrow, Deisher, Brown, Kulig, & Kipke, 1992), deliberate self-harm and suicide attempts (Kidd & Carroll, 2007), illness related to homelessness (e.g., effects of the cold, respiratory conditions) (Ensign & Gittelsohn, 1998; Farrow et al., 1992), and reproductive health concerns (e.g. pregnancy and miscarriage, menstruation, sexually transmitted infections) (Ensign, 2000; Greene & Ringwalt, 1998; Little, Gorman, Dzendoletas, & Moravac, 2007).

The wellbeing of these youth may be further compromised by injury resulting from the perpetration of or victimization from physical, property, and sexual violence experienced while homeless (Heerde and Hemphill 2013; Heerde et al. 2014a; Heerde et al. 2014b). Homeless youth commonly report engaging in assault, physical fights, and robbery (Heerde et al. 2014a), as well as theft and property damage (Heerde and Hemphill 2013). These youth also report being victims of beatings and physical assault (with and without a weapon), as well as robbery and mugging (Heerde and Hemphill 2013; Heerde et al. 2014a). Of particular importance in both the perpetration of, and victimization from, these behaviors is the role of substance use. Recent findings show perpetrating and being victimized by physical and property violence are generally associated with alcohol and marijuana use among homeless youth (Heerde and Hemphill 2014). It is possible that one mechanism through which

homeless youth may engage in perpetrating physically violent behavior or property offences or experience physical or property victimization is substance use.

This systematic review aims to collate, appraise and synthesize published studies investigating whether use of substances are associated with (1) perpetration of physically violent behavior or property offences or (2) experience of physical or property victimization among homeless youth. The types and rates of substances used by these youth within reviewed studies will also be examined.

Defining Homelessness, Perpetration of Offences, Experience of Victimization and Substance Use

Homelessness. Although no universal definition of homelessness exists internationally, there is a general consensus that persons who are homeless experience considerable social exclusion and marginalization, do not have safe, stable, or suitable physical housing or residence, and are at increased risk for engagement in crime and victimization and health risk behaviors (including substance use). The current review encapsulates these elements drawing on the definition of homeless in both the United States (US) and Canada (Canadian Homelessness Research Network, 2012; National Coalition for the Homeless, 2011), such that homeless persons include those who do not have occupancy at a suitable night-time residence, including individuals living directly on the streets or in spaces not intended for habitation, those in emergency shelters, and those who are provisionally accommodated (e.g. temporary accommodation) or at-risk of homelessness. Further, homeless youth may include those who are without parental or adult care or those who are members of homeless families.

Perpetration of offences and experience of victimization. Extant definitions of offences and victimization are generally consistent in recognizing that offences include behaviors engaged in by an individual and against another person, and victimization is the experience of having such behavior performed against them. Descriptions of offences and

victimization used in this review are drawn from the classifications of offending behavior and victimization among homeless youth put forward by the US Department of Justice (Office of Justice Programs, 2014a, 2014b). Perpetration of offenses is defined as behavior which is performed by an individual(s) against another person(s) or their property without consent. *Physical offences* include intentional and unwanted physical contact (e.g., hitting, punching, mugging, robbery, assault), threats to use intentional and unwanted force or physical contact (e.g., threats to harm using weapons, threatening gestures), and accosting another person in an aggressive or threatening manner (collectively referred to as physically violent behavior). *Property offences* include theft (including shoplifting), vandalism, fraud, arson, break and enter, and receipt or trading of stolen goods (collectively referred to as property offenses). Experience of victimization is defined as the harm or threat of harm performed against an individual or their property. *Physical victimization* includes assault, being threatened with harm with or without the use of weapons, being physically harmed, and being mugged or robbed (collectively referred to as physical victimization). *Property victimization* includes theft or burglary and having one's property damaged (collectively referred to as property victimization).

Substance use. The description of substance use applied in this review is based on the definition of psychoactive substance misuse specified by the World Health Organization; the ingestion of a legal substance in amounts other than that which is consistent with health or medical guidelines or the ingestion of an illegal substance (World Health Organisation, 2013).

Theoretical Framework Underpinning the Current Review

Although not commonly examined in studies of homelessness (McCarthy & Hagan, 1991, 1992), social-situational factors associated with homelessness (e.g., environmental and structural surroundings, peer relationships, interactions with acquaintances and unfamiliar

persons, social norms, needs and values) and the incidences a young person encounters while homeless may be factors influencing perpetration of, or victimization arising from, physical and property offences (Heerde and Hemphill 2013; Heerde et al. 2014a).

The *Integrated Cognitive Antisocial Potential Theory* (ICAP) (Farrington, 2005, 2014) arises from developmental and life course theories of criminology and informs the current review. The ICAP suggests that risk and protective factors, as well as situational factors, influence an individual's potential to engage in antisocial behaviors or offenses (termed antisocial potential). Risk factors are recognized as increasing the likelihood of engagement in unfavorable behaviors or experience of adverse outcomes (Hawkins, Catalano, & Miller, 1992). Conversely, protective factors are recognized as decreasing, mediating, or moderating the likelihood of engagement in unfavorable behaviors or experience of adverse outcomes (Jessor, Van Den Bos, Vanderryn, Costa, & Turbin, 1995). An individual's antisocial potential is categorized as being both long- and short-term. Long-term antisocial potential is influenced by *between-individual differences* (including socialization, life events, attachment, exposure to antisocial models), while short-term antisocial potential is influenced by *within-individual differences* (including situational or motivational factors). Under the ICAP, the extent to which an individual brings to fruition their antisocial potential and engages in antisocial behaviors or perpetrates offenses, depends on cognitive factors such as decision-making processes regarding opportunity to engage in behavior or the proximity of and access to potential victims.

In sum, the ICAP considers how the individual, and the environment in which they live, interact to influence perpetration of antisocial behaviors and offenses. The authors of the current review argue the underlying premise of the ICAP may also relate to victimization experiences among homeless youth. Where studies of homelessness have examined research findings within social-situational theoretical approaches, the importance of considering

environmental and social factors, including peer relationships and substance use, in their association with likelihood of perpetrating offences or having been victimized (Baron, 2004; Baron, Forde, & Kennedy, 2007; Fagan, Piper, & Cheng, 1987; Schreck, Wright, & Miller, 2002) have been highlighted. Specifically in relation to victimization *structural-choice theory of victimization* proposes that four key elements, proximity to crime, exposure to crime, guardianship, and target attractiveness/congruence, increase the likelihood of victimization (Tyler & Beal, 2010). Within this theory it is speculated that the closeness of an individual to potential offenders (proximity), exposure to the offending behaviors of others, being away from parents or other trusted significant adults with the ability to prevent victimization (guardianship), and personal characteristics (e.g. being female, age, having particular resources [e.g. a warm jacket]) (attractiveness) increase an individuals' vulnerability to being victimized. The authors of the current review contend the ICAP extends this theory relative to victimization experiences among homeless youth by considering the influence of between- and within-individual factors influencing likelihood for victimization.

In considering the ICAP, the authors of the current review contend that between-individual factors prior to becoming homeless (e.g., experience of childhood abuse and family violence) may increase not only the long-term antisocial potential of homeless youth, but also their probability for victimization. Likewise, within-individual factors such as substance use and situational factors including opportunities and perceived need for perpetrating offenses contribute to short-term antisocial potential, while proximity to potentially dangerous situations and perceptions that experiencing violence and victimization are normative behaviors within the street environment (Kipke, Simon, Montgomery, Unger, & Iversen, 1997) contribute to likelihood of victimization. The authors contend that substance use is associated with perpetration of offences and victimization among homeless youth due to interplay between the homeless young person themselves (including thought and decision-

making processes), their experiences prior to entering homelessness, and the environment to which these young people must socially adapt, and in which they currently reside (i.e., homelessness).

Method

Search Strategy

The systematic search was conducted in accordance with the guidelines and criteria for systematic reviews described by the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) Statement (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). Twelve psychology, health, social science, and criminology electronic databases were searched using database-specific controlled subject vocabulary (i.e., subject headings) and (or) as keywords in the title and abstract to ensure search terms were constant across each database. Search terms encompassed four exclusive subject areas, (1) homeless youth, (2) substance use, (3) perpetration of physically violent behavior and property offences, and (4) experience of physical and property victimization. A full list of databases and search terms used in conducting the systematic search are provided in Table 1.

Insert Table 1 here

Inclusion criteria. In accordance with the PRISMA statement (Moher et al., 2009) and to ascertain published studies that were of the utmost relevance to the aims of the review, eligibility criteria was established prior to conducting the systematic search. To be eligible for inclusion published studies were required to: (a) report on a sample of homeless youth (baseline age 12-24 years), (b) be published in the English language, (c) contain an abstract of the study, (d) be published between 1990 and 2013, (e) present rates of substance use, and (f) report findings describing associations between substance use and either (i) physically violent behavior or property offences perpetrated or (ii) physical or property victimization experienced by homeless youth. No restrictions were placed on whether youth were without

parental or adult care or were members of homeless families, the minimum sample size, or the country of origin of publications. Of utmost importance to the review was an examination of the most up-to-date research conducted relevant to the foci of this review, hence the date range for publications was restricted to those published in the past twenty years. The PRISMA diagram of published studies is provided in Figure 1.

This review is concerned with self-reported perpetration of, and victimization from, physically violent behaviors and property offences, hence studies were discarded where they reported police contact or arrest for these behaviors and experiences. This was because contact with law enforcement was considered to be defined by authority figures (e.g., police) rather than youth themselves, and measures of ‘arrests’ could not readily be classified into ‘perpetration’ or ‘victimization’. Therefore, studies of this nature did not fit within the aims of the review and accounted for the exclusion of seven studies (Chapple, Johnson, & Whitbeck, 2004; Chen, Thrane, Whitbeck, & Johnson, 2006; Coward Bucher, 2008; Ferguson et al., 2011; Kaufman & Widom, 1999; Kempf-Leonard & Johansson, 2007; McCarthy & Hagan, 1991). Other discarded studies were excluded from the review as they were not consistent with the eligibility criteria underpinning the foci of the review including: the non-examination of substance use in its association with the perpetration of, or victimization from, physically violent behavior or property offences; the analysis of data from non-homeless persons or homeless persons outside the stipulated age range; no report of findings from quantitative analyses describing associations between substance use and either perpetration of, or victimization from physically violent behaviors or property offences; and the unavailability of the study in English language. Further, dissertations, book reviews, and non-scholarly and non-peer reviewed papers (e.g., ‘grey’ literature) were also discarded from the review.

The lead author appraised the abstracts of retrieved studies to determine the initial relevance of studies for inclusion in the review. The content of the study, with reference to the eligibility criteria and aims of the review, was inspected to determine the relevance of the study for inclusion, where this could not be sufficiently determined through the study abstract. The lead author thoroughly read and examined each article for final inclusion in the review. The citations of included papers were scanned to identify additional papers for examination. To ensure the accuracy of extraction and interpretation of relevant information, the second author checked the content of 30% of retrieved papers. This review utilizes the terms and concepts applied in each reviewed study to ensure accurate presentation of the specific forms of substances used, physically violent behavior, and property offences perpetrated, and experienced.

Insert Figure 1 here

Calculation of effect sizes. Effect sizes were calculated for all findings presented in the reviewed studies, regardless of whether or not findings presented were statistically significant. This is appropriate because effect size is not affected by sample size, and non-significant results may display large effect sizes. A range of statistical analysis techniques were used to calculate effect sizes due to the diverse range of statistical analyses used across reviewed studies. Findings were converted to Cohen's d , Cohen's f^2 , or a Phi (ϕ) coefficient (Tabachnick & Fidell, 2013) to facilitate comparison of the magnitude of the degree of relationship or strength of association. Current recommended guidelines were applied to calculated coefficients, in order to interpret the degree of difference in effect sizes. For Cohen's d and Phi (ϕ) coefficients, small, medium and large coefficients were between 0-.30, .31-.49, and greater than .50, respectively. For Cohen's f^2 coefficients between 0 and .15 were considered small, .16 and .34 medium, and greater than .35 large (Tabachnick & Fidell, 2013).

Results

A description of the nine published studies meeting the eligibility criteria and retained for analysis is presented in Table 2. Five reviewed studies were conducted on samples from the US and four on samples from Canada. Only two studies conducted analyses on longitudinal data (Crawford, Whitbeck, & Hoyt, 2011; Hoyt, Ryan, & Cauce, 1999). Study samples were commonly recruited from service (e.g., shelters) or street-based (e.g., street corners) sites. Sample sizes varied, there were generally equal numbers of males and females in study samples, and the average age of homeless youth ranged from 15 to 22 years. Unless otherwise stipulated the results presented within this review refer to homeless youth as most reviewed studies analyzed data obtained from samples of homeless youth without a comparison group.

Insert Table 2 here

Types and Rates of Substance Use by Homeless Youth

Table 3 presents the descriptive statistics for specific types of substances used by homeless youth across reviewed studies. The most commonly described substance used was alcohol. Other reported substances included cannabinoids (such as marijuana and hashish); organic and synthetic opioid analgesics (e.g., heroin); stimulants (e.g., cocaine); and hallucinogens (e.g., ecstasy). No reviewed study reported use of sedatives (e.g., valium) and hypnotics (e.g., lysergic acid diethylamide [LSD]); solvents (e.g., glue or inhalants); use of non-prescribed medications (e.g., antidepressants, painkillers); use of other stimulants and hallucinogens (e.g., nicotine and methylphenidate [Ritalin]) and tobacco. Concurrent use of multiple substances and substance abuse (e.g., drugs and alcohol) were also reported in some reviewed studies.

Alcohol. Two studies reported rates of alcohol use (MacLean, Embry, & Cauce, 1999a; Martin et al., 2009). MacLean et al., (1999b) reported 72% of their sample had consumed

alcohol over the past three months. Across the sample, 15% reporting using alcohol once or twice in the past three months, 11% six to nine times, 14% consumed alcohol 10-19 times, and 10% reported using alcohol more than 40 times over the past three months. Means and standard deviations for alcohol use were presented in three studies (Baron et al., 2007; Baron & Hartnagel, 1997, 1998).

Rates of alcohol use for subgroups of homeless youth showed alcohol use was highest among youth who reported perpetrating, and being victimized by, physically violent behavior (Martin et al., 2009). Specifically, results showed 18% of youth who reported being a victim of an assault (compared to 10% for non-victims) and 18% of youth who reported perpetrating an assault (compared to 11% for non-perpetrators) reported using alcohol.

Stimulants and hallucinogens. Incidences of cocaine and crack use in the past six months were described in one study (Martin et al., 2009) for subgroups of youth reporting perpetration of assault or occurrence of having been assaulted. Use of both substances varied across these subgroups, with higher rates of use evident among youth describing perpetration of assault (compared to non-perpetrators). No variation in cocaine use among youth who described having been physically assaulted (compared to not having been a victim of assault) was evident. However, those who had been physically assaulted reported using crack at slightly higher rates compared to those who had not been assaulted. Rates of methamphetamine use in this study were slightly greater for those who had perpetrated, or been victimized by, physical assault.

Cannabinoids. Of the reviewed studies, one reported rates of cannabinoid use among homeless youth. MacLean et al., (1999b) reported rates for monthly marijuana use, finding 62% of the sample had used cannabis in the past three months. Among the sample, 17% of youth reportedly used cannabis one to two times in the past three months, 8% six to nine

times, and 9% 10-19 times. Descriptive statistics for marijuana use were presented in one study (Baron et al., 2007).

Organic and synthetic opioid analgesics. One study reported rates showing use of organic and synthetic opioid analgesics, specifically heroin, among sub-groups of homeless youth. Martin and colleagues (2009) found little difference in rates of daily or more frequent heroin use between youth who had and had not been a victim of assault or between youth who had, or had not, assaulted another person.

Non-specific drug use. Some reviewed studies described rates of substance use among homeless youth across two main categories (a) intravenous drug use and (b) where the type of substance used was unspecified.

Intravenous drug use. One study reported estimates of injecting drugs (Martin et al., 2009). Rates of intravenous drug use were greater among subgroups of homeless youth who reported perpetrating assault or having been assaulted while homeless.

Unspecified substance use. MacLean et al., (1999b) reported 32% of youth in their sample described using hard drugs (defined as drugs other than marijuana) at least once in the past three months, with 32% recounting use of these drugs one to two times, 5% four to five times, and 3% 20-39 times.

Substance abuse. Rates for alcohol and drug abuse (measured using the University of Michigan Composite International Diagnostic Interview [UM-CIDI]) were reported by Whitbeck et al. (2004), where 42% of heterosexual and 52% of gay and lesbian youth reported alcohol abuse in their lifetime and 39% of heterosexual and 42% of gay and lesbian youth reported drug abuse. Rates of alcohol abuse were generally higher for male compared to female heterosexual youth and lesbian compared to gay youth.

Insert Table 3 here

Associations between Use of Substances and Perpetration of Physically Violent Behavior or Property Offences

The findings and effect sizes from seven studies that statistically examined whether substance use is associated with perpetration of physically violent behavior or property offences are presented in Table 4. One study reported associations between use of substances and perpetration of property offences (Baron & Hartnagel, 1997), three perpetration of physically violent behavior (Baron & Hartnagel, 1998; Crawford et al., 2011; Martin et al., 2009), and three utilized aggregate measures of physically violent behavior and property offences (Baron et al., 2007; MacLean et al., 1999a; Whitbeck, Hoyt, Yoder, Cauce, & Paradise, 2001). With the exception of one study (Crawford et al., 2011), all studies presented from findings from cross-sectional analyses. No reviewed studies presented analyses investigating associations between use of cannabinoids (e.g. marijuana), solvents (e.g. inhalants), sedatives (e.g. barbiturates), hypnotics (e.g. LSD) or use of non-prescribed medications and either perpetration of physically violent behavior or property offences. Also, use of nicotine and tobacco were not reported in any reviewed study.

Insert Table 4 here

Alcohol. Four Canadian studies investigated cross-sectional associations between alcohol consumption and perpetration of physically violent behavior (Baron et al., 2007; Baron & Hartnagel, 1997, 1998; Martin et al., 2009). Baron and Hartnagel (1997) found past month alcohol use was associated with increased property crime (measured by past year engagement in behaviors including breaking into a car, breaking into a building, taking something worth less than \$50, taking something worth more than \$50, breaking into a structure to sleep, stealing food, and taking a car without the permission of the owner) after adjusting for covariates (such as experience of childhood abuse, length of time homeless, peer engagement in crime, drug and alcohol use, and unemployment) with a large effect size

($f^2 = 1.14$). Alcohol use was not associated with violent crime (including use of physical force to get money or things from another person, attacking someone with a weapon or fists injuring them so badly they probably needed a doctor, getting into a fight, and taking part in a group fight) following adjustment for covariates. In a further study analyzing data from the same sample, Baron and Hartnagel (1998) found alcohol use was associated with assaulting another person, with a moderate effect size ($f^2 = .32$), but not related to perpetration of other physically violent behaviors (robbery, aggravated assault, group fights or violence). Alcohol use was associated with past year offending behavior (use of physical force to get money or things from another person; having attacked someone with a weapon or fists injuring them so badly they probably needed a doctor; having got into a fight for the fun of it; and taken part in a fight with a group of friends against another group) in additional analyses (Baron et al., 2007). In a more recent study, Martin et al., (2009) found similar results such that alcohol use was associated with a twofold increase in the odds of assaulting another person in adjusted analyses. The effect size was small indicating a slight effect of alcohol use on this behavior ($d = .17$).

Stimulants and hallucinogens. Cross-sectional associations between the use of cocaine, crack or methamphetamine and assault were investigated in one study (Martin et al., 2009). Following adjustment for covariates including gender, history of childhood physical and sexual abuse, and history of having lived in foster care, neither cocaine, crack or methamphetamine use were associated with perpetrating assault.

Organic and synthetic opioid analgesics. One reviewed study reported findings of cross-sectional adjusted analyses investigating use of heroin and perpetration of assault. No statistically significant association was found (Martin et al., 2009).

Non-specific drug use. Associations between use of multiple substances and perpetration of physically violent behavior or property offences were reported in seven

reviewed studies (Baron et al., 2007; Baron & Hartnagel, 1997, 1998; Crawford et al., 2011; MacLean et al., 1999b; Martin et al., 2009; Whitbeck et al., 2001). Baron and Hartnagel (1997) found drug use (indicated by past month use of alcohol, marijuana, or hashish) was cross-sectionally related to increased property violence (effect sizes $f^2 = 1.14$), however not to perpetration of violent crime. Similar results for assault were reported elsewhere (Martin et al., 2009). In studies by the same authors, drug use showed no statistically significant cross-sectional associations with perpetration of robbery, aggravated assault, assault, group fights, or violent behavior (Baron & Hartnagel, 1998). Conversely, drug use was associated with increased offending behavior (Baron et al., 2007). Longitudinal associations between drug use and violence (indicated by having held someone up or attacked someone to steal, started a physical fight in which someone was or could have been hurt, tried to hurt someone badly or been physically cruel to them, threatened someone with a weapon, or hurt someone with a weapon such as a bat, brick, broken bottle, knife, or gun) was examined in one other study (Crawford et al., 2011). Following adjustment for covariates including age, gender, sexuality, family violence, physical and sexual abuse, drug use, and gang participation, drug use was associated with increased perpetration of violence with a small effect size ($f^2 = .09$).

In their study, Whitbeck et al., (2001) conducted analyses using a combined measure of drug and alcohol use, indicated by use of alcohol, marijuana, cocaine or crack, LSD, crank or methamphetamine, opiates, speed, tranquilizers, downers, and inhalants. Findings showed use of these substances was cross-sectionally correlated with nonsexual deviant subsistence strategies (including taking money from someone, breaking in and taking money from a store or house, dealing drugs for money, and stealing or shoplifting food), an effect which held in adjusted analyses (effect size $d = .03$). MacLean et al., (1999b) found substance use in the past three months (the use of marijuana and other hard drugs) was positively correlated with delinquency (indicated by behaviors including lying, stealing, arguing, fighting, teasing, and

threatening another person) for both male and female youth in their sample. A large effect size was evident for male youth ($d = .60$) indicating a sizeable effect of substance use on delinquency for this sub-sample.

Substance abuse. Substance abuse was longitudinally associated with engagement in violence in one reviewed study in adjusted analyses (Crawford et al., 2011). An effect size of $f^2 = .09$ indicated a small degree of association.

Associations between Use of Substances and Experience of Victimization from Physically Violent Behavior or Property Offences

The results and effect sizes of five studies (Baron et al., 2007; Chen et al., 2006; Hoyt et al., 1999; Martin et al., 2009; Whitbeck et al., 2001) reporting analyses investigating associations between use of substances and physical or property victimization are presented in Table 5. All studies reported associations between use of substances and physical victimization, with only one presenting findings from longitudinal analyses (Hoyt et al., 1999). No reviewed studies examined associations between either physical and property victimization and use of solvents (e.g. inhalants), sedatives (e.g. barbiturates), cannabinoids (e.g. marijuana), hypnotics (e.g. LSD), non-prescribed medications, or tobacco and nicotine.

Alcohol use. Baron, Forde and Kennedy (2007) conducted cross-sectional analyses finding alcohol use (measured as the frequency of alcohol consumption) was associated with decreased victimization (indicated by past year experience of having had physical force used against you to get your money or things; been attacked with a weapon or fists/feet, injuring you so badly you needed a doctor; and been physically attacked for no apparent reason) (effect size $f^2 = .19$). The analyses controlled for covariates including violent peer relationships and being alone at the time of victimization. Conversely, Martin et al., (2009) found alcohol use was cross-sectionally associated with increased odds of assault (being

attacked, assaulted, or suffered any kind of violence) in adjusted analyses. The effect size for this association was small ($d = .18$).

Stimulants and hallucinogens. Martin et al., (2009) found after adjustment for covariates, use of cocaine, crack or methamphetamines were not related to having been assaulted.

Organic and synthetic opioid analgesics. Findings reported by Martin et al., (2009) showed heroin use was not associated with being a victim of assault, after adjusting for covariates.

Non-specific drug use. Three studies (Baron et al., 2007; Martin et al., 2009; Whitbeck et al., 2001) investigated associations between use of multiple substances and experience of physical victimization. Baron et al., (2007) found drug use (defined as how often youth smoked marijuana or hash during a month) showed no association with victimization, after controlling for covariates. Another study showed no association between having injected a drug in the last six months and being a victim of assault (Martin et al., 2009). Whitbeck et al. (2001) found drug and alcohol use (indicated by use of alcohol, marijuana, cocaine or crack, LSD, crank or methamphetamine, opiates, speed, tranquilizers, downers and inhalants) was positively correlated with physical victimization (having ever been robbed, beaten up, threatened with a weapon or assaulted and wounded with a weapon while homeless) with a large effect size ($d = .56$). However, after controlling for covariates including age, gender, history of family abuse, age at first becoming homeless and presence of social support, this association did not reach statistical significance.

Substance abuse. Two studies (Hoyt et al., 1999; Whitbeck et al., 2004) examined associations between abuse of substances and physical victimization. In longitudinal analyses, Hoyt, Ryan and Cauce (1999) found the odds for having been assaulted in the past three months were increased where youth reported substance abuse (alcohol, marijuana and

hard drug use) for males, but not for females. The effect size of the associations for males was small ($d = .07$). Whitbeck et al. (2004) investigated associations for both alcohol and drug abuse (measured according to the UM-CIDI). Findings of adjusted analyses, showed alcohol abuse had no effect on physical victimization (having been beaten up, robbed, threatened with a weapon, and assaulted with a weapon), while drug abuse was associated with increased report of having been physically victimized. The effect size for the latter association was large ($f^2 = .51$) showing a strong degree of association between drug abuse and physical victimization in this study.

Insert Table 5 here

Discussion

This review is the first of its kind to appraise published studies investigating associations between substance use among homeless youth and their perpetration of, or victimization from, physically violent behavior or property offences. The types and rates of substances used in reviewed studies were also considered. Results showed rates of substances used were substantially inconsistent, possibly due to the small number of studies reviewed, however most likely due to variation in both the instruments utilized to measure substance use and the time period within which substances were used. Findings were conflicting as to whether substance use is associated with the perpetration of physically violent behavior or property offences. Similar findings were observed for the influence of substance use on experience of physical victimization. No reviewed studies examined whether substance use is associated with experience of property victimization. While conclusive evidence was not obtained that substance use is associated with either the perpetration of physically violent behavior or property offences, or physical or property victimization, the findings suggest substance use may be an important mechanism by which these behaviors and/or experiences transpire.

This study has attempted to contribute to the knowledge base of behaviors engaged in and experienced by homeless youth. The findings of this review show that studies reporting on physically violent behaviors and property offences, and physical and property victimization, are particularly lacking. A small range of behaviors (including assault with and without weapons, fighting and robbery) and victimization experiences (typically having been assaulted) were commonly reported across the reviewed studies. Prior research has shown studies reporting on specific forms of physically violent behavior and property offences perpetrated by homeless youth typically include a small range of behaviors (Heerde and Hemphill 2013; Heerde et al. 2014a) so the findings of the current review are not unexpected. However, in comparison, studies reporting on specific forms of physical or property victimization are shown to be generally greater in number (Heerde and Hemphill 2013; Heerde et al. 2014a), hence the small number of studies eligible for inclusion and appraisal in this review is surprising. Although much has been written regarding the vulnerabilities and health concerns of homeless youth (Busen & Engebretson, 2008; Ensign & Gittelsohn, 1998; Rosenthal & Rotheram-Borus, 2005; Unger et al., 1998a; Unger et al., 1998b; Yoder, 1999), the findings of this review suggest substance use among homeless youth, as well as their engagement in physical or property offences and victimization experiences, have largely been investigated independently of one another. It is clear from the small number of studies meeting the criteria for inclusion in this review that the influence of substance use on perpetration of offences and victimization experiences is a much-neglected area of research.

Although findings showed no conclusive evidence that substance use is associated with either the perpetration of physically violent behavior or property offences, or physical or property victimization, the current findings suggest possible cross-sectional trends for increased perpetration of physically violent behavior and property offences when youth report using substances. Similar trends are apparent for physical victimization experiences.

Only two studies presented findings from longitudinal analyses (Crawford et al., 2011; Hoyt et al., 1999), further suggesting substance use may be associated with perpetration of physically violent behavior or physical victimization. Effect sizes were small providing an indication these behaviors and experiences may be associated through shared risk factors (e.g., prior victimization and childhood trauma, length of time homeless, peer affiliations). Thus, it is important to investigate which situational factors may contribute to the likelihood of the perpetration of, or victimization from, physically violent behaviours, over and above substance use itself. Further investigations accounting for situational variables in longitudinal investigations examining whether substance use is associated with the perpetration of these behaviors or being victimized are especially warranted.

Understanding the vulnerabilities of homeless youth in relation to their potential to engage in substance use (whether that be to initiate or continue using substances), perpetrate physically violent behavior or property offences, or be victimized, requires consideration of risk factors faced prior to entering homelessness. Of particular concern are factors associated with pathways to antisocial behaviors (including physical and property violence) encountered within the family and community domains, as described within the ICAP theory. The ICAP postulates between-individual differences, such as opportunity for socialization, modeling and life events, parent attachment, and exposure to antisocial models, influence one's long-term antisocial potential (Farrington, 2005, 2014). It is well established that homeless youth have commonly experienced some form of violent victimization at the hands of their parents or other trusted significant adults (including childhood physical and sexual abuse), family conflict, low parental attachment, and poor family management practices (Bearsley-Smith et al., 2008; Edidin, Ganim, Hunter, & Karnik, 2012; Hyde, 2005). For some homeless youth, further housing instability and frequent moves between alternate out-of-home care settings (Heerde et al. 2012a; Heerde et al. 2012b) may also be commonplace.

Family-based harms such as these are between-individual differences influencing the long-term antisocial potential and likelihood of victimization of these youth. For example, five reviewed studies examined the influence of family factors (including parental supervision, parental affect, family violence, childhood physical and (or) sexual abuse and history of residence in out-of-home care) as covariates for associations between substance use and the perpetration of physically violent behavior or property offences and physical or property victimization. In support of the ICAP theory, childhood physical abuse displayed statistically significant associations with perpetration of physically violent behavior (Baron & Hartnagel, 1997; Crawford et al., 2011) but not property offences (Baron & Hartnagel, 1997). Childhood sexual abuse was also predictive of perpetration of physically violent behavior in one study (Crawford et al., 2011). Statistically significant effects of childhood physical and sexual abuse on physical victimization were also evident (Martin et al., 2009; Whitbeck et al., 2004).

Consistent with the ICAP theory, the findings of this review suggest structural and situational factors encountered while homeless contribute to associations between substance use and the likelihood of perpetrating or being victimized by physically violent behavior or property offences. Baron and Hartnagel (1997) found length of time on the street, peer pressure, and interacting with peers also engaging in offending behaviors remained statistically significant in the fully adjusted model examining associations between substance use and perpetration of both physically violent behavior and property offences. Similarly, length of time on the street was found to be cross-sectionally associated with robbery and violent behavior and peer pressure associated with aggravated assault (Baron & Hartnagel, 1998). Interactions with peers engaging in the perpetration of offences remained statistically significant in models investigating associations between substance use and perpetration of both assault and physically violent behavior (Baron & Hartnagel, 1998). In another study,

gang involvement, deviant peer relationships, and prior street experience remained statistically significant predictors for physically violent behavior (Crawford et al., 2011). Comparable situational and structural factors including gang involvement, length of time homeless, prior homelessness experiences, and affiliations with deviant peers were statistically significant in models examining associations between substance use and physical victimization (Hoyt et al., 1999; Whitbeck et al., 2004; Whitbeck et al., 2001).

Further, the ICAP theory proposes situational influences may vary depending on the form of antisocial behavior an individual perpetrates (Farrington, 2005, 2014). Findings of the studies in this review showed some similarities in the situational factors influencing the perpetration of physically violent behavior or property offences and victimization experiences. Moderation and mediation analyses are needed to examine if these situational and structural contexts change the relationship between substance use and both engagement in physically violent behavior and property offences or substance use and physical and property victimization. It is also important to examine how these situational and structural factors may influence continuation or desistance of these behaviors and experiences. It is possible that such situational and structural factors are modifiable factors by which the incidence of substance use among homeless youth can be reduced, and in turn lessen the likelihood of these youth perpetrating or being victimized by physically violent behavior or property offences.

The instability and vulnerability faced by youth after leaving home, in the absence of support from significant adults, may contribute to their use of substances, and thus increase their short-term antisocial potential. It is feasible that homeless youth use substances as a coping mechanism and a means by which to increase their capacity to adapt to street life. The findings of this study have demonstrated homeless youth most commonly describe using substances classified as depressants, namely alcohol and cannabis. As proposed by the ICAP

theory, an individual's progression from their antisocial potential to the perpetration of these behaviors is the result of one's thought and decision making processes (Farrington, 2005, 2014). For homeless youth, the use of physically violent behavior (e.g. fights) or property offences (e.g. shoplifting) may be perceived as required in order to obtain commodities required for daily survival including seeking, obtaining and maintaining safe shelter, responding to violent peers, or in response to a paucity of money and food. Prior studies have postulated homeless youth are not afforded the opportunity to adhere to laws and regulations that prohibit behaviors such as theft, engaging in physical altercations, shoplifting, or carrying a weapon (Chen, Thrane, Whitbeck, Johnson, & Hoyt, 2007; Farrow et al., 1992; Schwartz, Sorensen, Ammerman, & Bard, 2008). Consequently, thoughts surrounding the resultant decision to engage in these behaviors, as well as ensuing victimization, may be common elements of daily experiences for these youth (Busen & Engebretson, 2008) based on the need to adapt to the chronic stress associated with street life and the need to assure survival.

There is also evidence that associations between substance use and both perpetration of, and victimization from, physically violent behavior may differ by gender such that associations may be greater for males compared to females (Hoyt et al., 1999; MacLean et al., 1999b). Research literature provides some indication that gender differences in health risks among homeless youth are apparent, however, in opposition to the findings of this review generally report higher rates of health risks among females. For instance, female homeless youth commonly report higher levels of suicidality (Kidd & Carroll, 2007), drug risk behaviors (Montgomery et al., 2002), and mental health problems (e.g. anxiety) (Ritchey, La Gory, & Mullis, 1991). It is important to recognize that further mental health problems (e.g., depression and post-traumatic stress disorder), substance use, and injury may also be arise from perpetration of, or victimization from, physically violent behavior or property

offences. The extent to which gender may influence associations between substance use and both perpetration of, and victimization from, physically violent behavior requires investigation in order to ascertain how intervention and prevention programs may be targeted to the specific concerns and experiences of young homeless males and females.

It is plausible that use of substances is a coping mechanism adopted by homeless youth to escape not only from the psychological trauma associated with adverse family experiences but also the thoughts and feelings associated with both the perpetration of behaviors required to adapt to street life and re-victimization experiences. Coping theory has proposed emotion-focused forms of coping, including substance use, are used by individuals in attempt to change thoughts and emotions linked to stressful experiences (Lazarus & Folkman, 1984) and reduce emotional discomfort. Limited prior research has shown homeless youth commonly report using substances as a means of coping (Edidin et al., 2012; Fisher, Florsheim, & Sheetz, 2005; Kidd, 2003; Rhule-Louie, Bowen, Baer, & Peterson, 2008). The literature would benefit from quantitative studies examining use of substances as a coping mechanism among homeless youth in order to develop an understanding of the common types of substances used by youth in coping with their homeless experiences. This should include investigation into the specific types of experiences and concerns with which these youth are attempting to cope including physical and psychological health concerns. Research is needed on prevention and intervention approaches aiming to decrease the incidence and severity of substance use, abuse, and dependence among these youth and to improve their health status. The findings of such studies are likely to present opportunities for the development of holistic services attending to the numerous adverse physical and psychological health implications prevalent for these young people.

Study Limitations

Limitations of reviewed studies. Several limitations to the reviewed studies are noted. Firstly, there exists disparity in the measures and measurement of substance use across reviewed studies. For example, some studies utilized established diagnostic measures (e.g., the UM-CIDI) while other studies did not describe the criteria by which substance use, dependency, or abuse were measured or categorized. Similarly, inconsistencies exist in the time periods within which substance use was measured, with some studies reporting rates for daily use and others weekly, monthly, yearly, or lifetime use. Second, there was variation in measures of perpetration of, and victimization from, physically violent behavior and property offences. For instance, some studies used single items to measure forms of behavior perpetrated or experienced such as ‘attacking or stabbing someone’ and ‘having been threatened with a weapon’. Analogous to measures of substance use, variation existed in the frequency and time period within which these behaviors occurred (e.g., ‘past month’ versus ‘since becoming homeless’).

Third, although numerous studies were located which reported rates of substance use; few studies were located which examined associations between use of these substances and behavior or victimization experiences. Critically, only two reviewed studies were longitudinal in design; hence, the findings of the remaining studies are restricted in their ability to infer that substance use is temporally associated with perpetration of, or victimization resulting from, physically violent behavior or property offences.

Next, although some reviewed studies directly compared rates of substance use among sub-groups of homeless youth, no reviewed studies examined associations between substance use and these behaviors or experiences for these sub-groups. Further, no reviewed studies directly compared rates of substance use among homeless youth to a matched comparison group of non-homeless youth.

Finally, there exists a lack of representation of published studies from outside Canada and the US; hence, it is unclear whether the strength of associations between substance use and the perpetration of, or victimization from, physically violent behavior or property offences varies by country. Studies comparing the strength of the relationships investigated in this review in various countries are warranted.

Limitations of the current review. Several limitations to this literature review and the interpretation of findings are acknowledged. The search criteria did not differentiate between youth who were without parental or adult care while homeless and those who were members of homeless families. Although most reviewed studies defined homeless youth as those who had run away, drifted, or been pushed out of their family home, it is unclear in some studies whether or not the study sample included youth who were members of homeless families. This is important because it is possible that rates of substance use, perpetration of physically violent behavior or property offences, or victimization experiences may be lower among youth who are members of homeless families. Similarly, being part of a homeless family may have an influence on associations between substance use and these behaviours and experiences. Further research is required examining whether differences in substance use, behavior, or victimization exist for these sub-groups of homeless youth. In the current paper, a conservative method was adopted with inclusion only of those studies investigating associations between substance use and either perpetration of, or victimization from, physically violent behavior or property offences among homeless youth, rather than other behaviors (e.g. sexual violence or victimization). It is likely that some participants in reviewed studies had engaged in multiple offences (that is “versatile” offenders), experienced multiple forms of victimization, or both perpetrated offences and experienced victimization. Due to interest in exploring self-reported experiences of homeless youth, this review excluded studies reporting associations between substance use and police contact or arrest

(for either perpetration of, or victimization from, physically violent behavior or property offences). Last, 'grey literature' examining this topic was excluded due to a focus on scholarly peer-reviewed studies.

Conclusions

The present study presents a unique synthesis and appraisal of literature reporting associations between substance use among homeless youth and their perpetration of, or victimization from, physically violent behavior or property offences. The available evidence, while not conclusive, suggests cross-sectional trends for increased perpetration of physically violent behavior and property offences and increased experience of physical victimization when youth report using substances. To advance knowledge on the influence of substance use on these behaviors and experiences, future longitudinal studies are warranted. Further, future understandings concerning the behavior of homeless youth can be attained through research examining how the individual and the environment in which they live, interact to influence the behaviors and victimization experiences. This should include a close examination of those situational and structural factors associated with homelessness that may contribute to initiation into the use of substances, as well as those factors that may play a part in continued substance use. Future research investigating the specific types of experiences and concerns with which homeless youth attempt to cope is also warranted to inform prevention and intervention approaches aimed to decrease the incidence and severity of numerous adverse health implications (physical and psychological) prevalent for these young people.

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Table 1.

Systematic search databases and search terms.

Discipline	Databases
Psychology	ProQuest Psychology, PsycArticles, PsycInfo, Psychology and Behavioral Sciences Collection
Criminology	Australian Criminology Database (CINCH), Criminal Justice Collection, ProQuest Criminal Justice
Health	ProQuest Nursing and Allied Health Source
Social Work	Social Work Abstracts, SocIndex, ProQuest Social Sciences
Multidisciplinary	Academic Search Complete
Area	Search terms
Homeless youth	'homeless*', 'youth', 'adol*', 'abandoned children', 'homeless children', 'homeless persons', 'homeless families', 'homeless men', 'homeless students', 'homeless women', 'homeless youth', 'homeless teenagers', 'street youth', 'at-risk youth', 'runaway teenagers', 'runaway children', and 'street children'
Substance use	'aerosol sniffing', 'inhalant abuse', 'solvent abuse', 'alcoholism', 'binge drinking', 'alcohol', 'drunkenness', 'drinking behavior', 'youth alcohol use', 'underage drinking', 'nicotine addiction', 'tobacco', 'cigarettes', 'marijuana', 'heroin', 'narcotics', 'cocaine', 'psychotropic drug use', 'drugs', 'pharmaceuticals', 'non-prescription drugs', 'psychotropic drugs', 'substance abuse' and 'drug abuse'
Perpetration of physically violent behavior and property offences	'offences against property', 'property damage', 'arson', 'forgery', 'fraud', 'larceny', 'robbery', 'theft', 'vandalism', 'graffiti', 'drug traffic', 'violence', 'youth violence', 'offenses against the person', 'violent offenders', 'aggravated assault', 'armed robbery', 'mugging', 'drug abuse & crime', 'felonies', 'firearms & crime', 'assault', 'harassment', 'juvenile delinquency', 'offenses against public safety', 'public safety', 'violent crime', 'delinquency' and 'youth crime'
Experience of physical and property victimization	'criminal victimization', 'victimization', 'crime victimization', 'victim*', 'victims of crime' and 'fear of crime'

Note. An extensive search of substance use, perpetration of offences and experience of victimization among homeless youth was required as specific forms of these behaviors were often embedded within the text of published studies.

Table 2.

Description of studies meeting review criteria.

Author	Country of Origin	Study design	Site of data collection	Data Collection Method	Baseline Sample size	Gender (% female)	Average Age (years)
Baron, Forde, & Kennedy (2007)	Canada	Cross-sectional	Street-based sites	Structured interview	125	0.0	18.8
Baron & Hartnagel (1997) [#]	Canada	Cross-sectional	Street-based sites	Structured interview	200	0.0	18.9
Baron & Hartnagel (1998) [#]	Canada	Cross-sectional	Street-based sites	Structured interview	200	0.0	18.9
Crawford, Whitbeck, & Hoyt (2011)	USA	Longitudinal	Service and street-based sites	Structured interview	300	56.0	17.4
Hoyt, Ryan, & Cauce (1999)	USA	Longitudinal	Service-based sites	Structured interview	304	44.0	16.9
MacLean, Paradise, & Cauce (1999b)	USA	Cross-sectional	Service-based sites	Structured interview	354	42.0	16.4
Martin, Palepu, Wood, Li, Montaner, & Kerr (2009) ^a	Canada	Cross-sectional	Street-based sites	Structured interview	478	27.6	21.9
Whitbeck, Chen, Hoyt, Tyler, & Johnson (2004)	USA	Cross-sectional	Service and street-based sites	Structured interview	428	56.3	17.4
Whitbeck, Hoyt, Yoder, Cauce, & Paradise (2001)	USA	Cross-sectional	Service and street-based sites	Structured interview	974	Midwest 60 Seattle 45.4	Midwest 16.3 Seattle 17.1

Note: Service sites include shelters and drop-in centers. Street-based sites include street corners, populated areas/blocks, parks, alleys, bars, and fast-food restaurants.

^adata collected as part of At-Risk Youth Study (ARYS) [#]Same analyzed sample. USA = United States of America.

Table 3.

Descriptive statistics for studies reporting rates of substance use amongst homeless youth.

Author	Substances used	Statistical analysis method	Types and rates of substance use	Effect size
Baron, Forde, & Kennedy (2007)	Alcohol Marijuana or hashish	Mean (standard deviations)	Alcohol (analytic sample): 8.7[5.3] Marijuana or hashish (analytic sample): 5.0[2.2]	n/a
Baron & Hartnagel (1997, 1998)	Alcohol Drugs	Mean (standard deviations)	Alcohol (analytic sample): 4.10[1.82] Drugs (analytic sample): 4.51[2.25]	n/a
Crawford, Whitbeck, & Hoyt (2011)	Substance abuse	Mean (standard deviations)	Substance abuse (analytic sample): .64[not reported]	n/a
Hoyt, Ryan, & Cauce (1999)	Substance abuse	Mean (standard deviations)	Substance abuse (analytic sample): 2.43[1.59]	n/a
MacLean, Paradise, & Cauce (1999b)	Substance use Alcohol Marijuana Hard drugs	Percentages	Substance Use (past 3-months, analytic sample): 71.5% reported alcohol use 62.1% reported cannabis use 31.5% reported hard drug use Alcohol Use (past 3-months, analytic sample): 28.5% reported no alcohol use 15.2% reported using alcohol 1-2 times 12.1% reported using alcohol 3-5 times 10.7% reported using alcohol 6-9 times 13.8% reported using alcohol 10-19 times 9.3% reported using alcohol 20-39 times 10.4% reported using alcohol more than 40 times Marijuana Use (past 3-months, analytic sample): 37.9% reported no marijuana use 16.7% reported using marijuana 1-2 times 10.7% reported using marijuana 3-5 times 7.6% reported using marijuana 6-9 times 8.8% reported using marijuana 10-19 times 8.2% reported using marijuana 20-39 times 10.2% reported using marijuana more than 40 times Hard drug use (past 3-months, analytic sample):	n/a

			<p>68.5% reported no hard drug use 13.4% reported using hard drugs 1-2 times 3.1% reported using hard drugs 3-5 times 4.5% reported using hard drugs 6-9 times 4.0% reported using hard drugs 10-19 times 2.8% reported using hard drugs 20-39 times 3.7% reported using hard drugs more than 40 times</p>	
<p>Martin, Palepu, Wood, Li, Montaner, & Kerr (2009)^a</p>	<p>Cocaine Crack Heroin Methamphetamine Alcohol Injected drugs</p>	<p>Percentages</p>	<p>Substance use (victim of assault): 4.4% reported cocaine use 19.1% reported crack use 13.0% reported heroin use 18.3% reported methamphetamine use 17.8% reported alcohol use 28.3% reported injecting drugs Substance use (not a victim of assault): 4.4% reported cocaine use 17.3% reported crack use 13.3% reported heroin use 13.7% reported methamphetamine use 9.7% reported alcohol use 24.2% reported injecting drugs Substance use (assaulted someone): 6.7% reported cocaine use 24.2% reported crack use 12.7% reported heroin use 17.6% reported methamphetamine use 18.2% reported alcohol use 24.9% reported injecting drugs Substance use (have not assaulted someone): 3.2% reported cocaine use 15.0% reported crack use 13.4% reported heroin use 15.0% reported methamphetamine use 11.2% reported alcohol use 26.8% reported injecting drugs</p>	<p>n/a</p>
<p>Whitbeck, Chen, Hoyt, Tyler, & Johnson (2004)</p>	<p>Alcohol Drugs</p>	<p>Percentages</p>	<p>Substance use (lifetime, gay/lesbian sample): 52.4% reported alcohol abuse 47.6% reported drug abuse Substance use (lifetime, heterosexual sample):</p>	<p>n/a</p>

			42.2% reported alcohol abuse 39.2% reported drug abuse Substance use (lifetime, male gay sample): 31.6% reported alcohol abuse 47.4% reported drug abuse Substance use (lifetime, male heterosexual sample): 50.0% reported alcohol abuse 47.0% reported drug abuse Substance use (lifetime, female lesbian sample): 61.4% reported alcohol abuse 47.7% reported drug abuse Substance use (lifetime, female heterosexual sample): 35.5% reported alcohol abuse 32.5% reported drug abuse	
Whitbeck, Hoyt, Yoder, Cauce & Paradise (2001)			Drug/alcohol use (Midwest sample): 5.23[5.58] Drug/alcohol use (Seattle sample): 8.24[5.72] Higher rates of drug/alcohol use (χ^2 -7.92***)	ϕ .09

Note. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, NS = not statistically significant, χ^2 = chi-square, ϕ = phi coefficient

^adata collected as part of At-Risk Youth Study (ARYS)

Table 4.

Empirical studies reporting associations between substance use and perpetration of physically violent behavior and property offences

Author	Substance(s) used	Physically violent behavior or property offence perpetrated	Statistical analysis method	Findings	Effect size
Baron, Forde & Kennedy (2007)	Drinking Drug use	Offending	Multivariate regression	Drinking (analytic sample): Decreased offending (b -.03**) Drug use (analytic sample): Increased offending (b .10**)	n/a n/a
Baron & Hartnagel (1997) [#]	Alcohol Drugs	Property crime Violent crime	Ordinary Least Squares Regression	Alcohol use (analytic sample): Increased property crime (β .13*) No effect on violent crime (β .04, p NS) Drug use (analytic sample): Increased property crime (β .23*) No effect on violent crime (β .03, p NS)	f^2 1.14 f^2 .71 f^2 1.14 f^2 .71
Baron & Hartnagel (1998) [#]	Alcohol use Drug use	Robbery Aggravated assault Assault Group fights Violence	Multivariate regression	Alcohol use (analytic sample): No effect on robbery (β -.03, p NS) No effect on aggravated assault (β .11, p NS) Increased assault (β .18*) No effect on group fights (β .10, p NS) No effect on violence (β .08, p NS) Drug use (analytic sample): No effect on robbery (β .04, p NS) No effect on aggravated assault (β -.06, p NS) No effect on assault (β .06, p NS) No effect on group fights (β .00, p NS) No effect on violence (β .04, p NS)	f^2 .43 f^2 .37 f^2 .32 f^2 .28 f^2 .45 f^2 .43 f^2 .37 f^2 .32 f^2 .28 f^2 .45
Crawford, Whitbeck, & Hoyt (2011)	Substance abuse Using drugs	Violence	Multivariate regression	Substance abuse (analytic sample): Increased violence (b 3.03***) Increased violence (β 1.87**) Using drugs (analytic sample): Increased violence (β 2.01**)	f^2 .02 f^2 .09 f^2 .09
MacLean, Paradise, & Cauce (1999b)	Substance use	Delinquency	Pearson correlations	Substance use (female sample): Positive association with delinquency (r .22**) Substance use (male sample): Positive association with delinquency (r .29**)	d .45 d .60

Martin, Palepu, Wood, Li, Montaner, & Kerr (2009) ^a	Cocaine Crack Heroin Methamphetamine Alcohol Injected drug	Assault	Logistic regression	Cocaine use (analytic sample): No effect on assaulting someone (AOR 1.84, <i>p</i> NS)	<i>d</i> .15
				Crack use (analytic sample): No effect on assaulting someone (AOR 1.45, <i>p</i> NS)	<i>d</i> .09
				Heroin use (analytic sample): No effect on assaulting someone (AOR 1.08, <i>p</i> NS)	<i>d</i> .02
				Methamphetamine use (analytic sample): No effect on assaulting someone (AOR 1.19, <i>p</i> NS)	<i>d</i> .04
				Alcohol use (analytic sample): Increased assaulting someone (AOR 2.02*)	<i>d</i> .17
				Injection drug use (analytic sample): No effect on assaulting someone (AOR .70, <i>p</i> NS)	<i>d</i> -.09
Whitbeck, Hoyt, Yoder, Cauce, & Paradise (2001)	Drug/alcohol use	Nonsexual deviant subsistence strategies	Pearson correlations Logistic regression	Drug/alcohol use (analytic sample): Positive association with non-sexual subsistence strategies (<i>r</i> .36**)	<i>d</i> .78
				Increased nonsexual deviant subsistence strategies (OR 1.11***)	<i>d</i> .03

Note. **p* < 0.05, ***p* < 0.01, ****p* < 0.001, NS = not statistically significant

OR = odds ratio, AOR = adjusted odds ratio, *b* = unstandardized beta coefficient, β = standardized beta coefficient, *r* = correlation coefficient, *d* = Cohen's *d*, *f*² = Cohen's *f*²

^adata collected as part of At-Risk Youth Study (ARYS)

[#]Same analyzed sample.

Table 5.

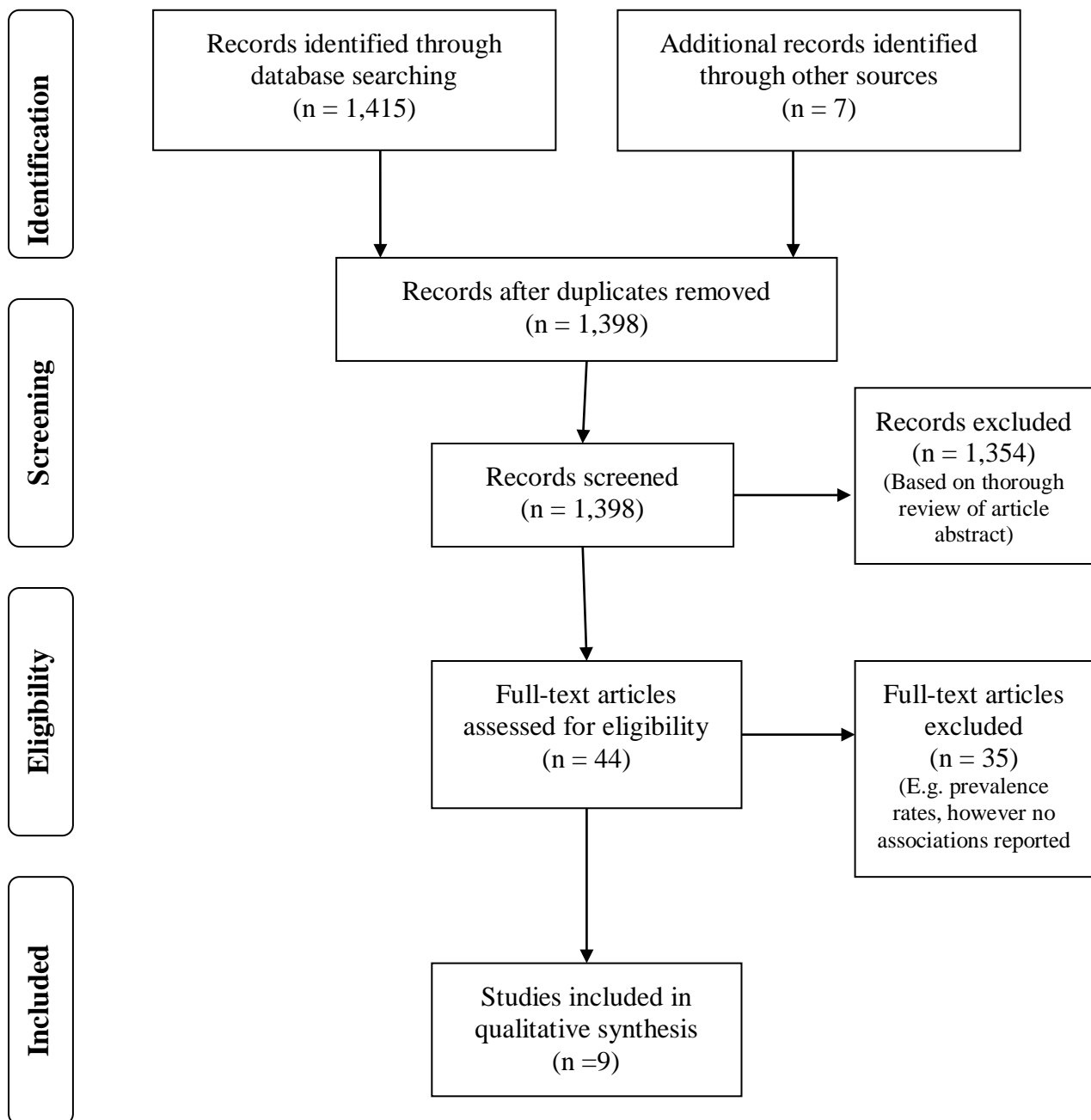
Empirical studies reporting associations between substance use and victimization from physically violent behavior or property offences

Author	Substance(s) used	Victimization from physically violent behavior or property offences	Statistical analysis method	Findings	Effect size
Baron, Forde, & Kennedy (2007)	Drinking Drug use	Victimization	Multivariate regression	Drinking (analytic sample): Decreased victimization ($b = -.03^{**}$) Drug use (analytic sample): No effect on victimization ($b = -.01$, NS)	f^2 .19 f^2 .19
Hoyt, Ryan, & Cauce (1999)	Substance abuse	Assault victimization	Logistic regression	Substance abuse (male sample): Increased assault victimization (OR 1.33 **) Substance abuse (female sample): No effect on assault victimization (OR 1.10, p NS)	d .07 d .02
Martin, Palepu, Wood, Li, Montaner, & Kerr (2009) ^a	Cocaine Crack Heroin Methamphetamine Alcohol Injected drug	Victim of an assault	Logistic regression	Cocaine use (analytic sample): No effect on assaulting someone (AOR .96, p NS) Crack use (analytic sample): No effect on assaulting someone (AOR .92, p NS) Heroin use (analytic sample): No effect on assaulting someone (AOR .99, p NS) Methamphetamine use (analytic sample): No effect on assaulting someone (AOR 1.20, p NS) Alcohol use (analytic sample): Increased being assaulted (AOR 2.10*) Injection drug use (analytic sample): No effect on assaulting someone (AOR 1.02, p NS)	d -.001 d -.02 d -.002 d .04 d .18 d .004
Whitbeck, Chen, Hoyt, Tyler, & Johnson (2004)	Alcohol abuse Drug abuse	Physical victimization	Ordinary least squares Logistic regression Multivariate regression	Alcohol abuse (analytic sample): No effect on physical victimization (β .05, p NS) Drug abuse (analytic sample): Increased physical victimization (β .11*)	f^2 .51 f^2 .51
Whitbeck, Hoyt, Yoder, Cauce, & Paradise (2001)	Drug/alcohol use	Physical victimization	Pearson correlations Logistic regression	Drug/alcohol use (analytic sample): Positive association with physical victimization (r .27 **) No effect on physical victimization (OR 1.02, p NS)	d .56 d .005

Note. * $p < 0.05$, ** $p < 0.01$, NS = not statistically significant. OR = odds ratio, AOR = adjusted odds ratio, b = unstandardized beta coefficient, β = standardized beta coefficient, r = correlation coefficient, d = Cohen's d , f^2 = Cohen's f^2 , ^adata collected as part of At-Risk Youth Study (ARYS)

Figure S1.

PRISMA diagram of published studies



Note. Qualitative synthesis in this context refers to the authors extracting information from eligible studies and describing and synthesizing the findings of these eligible studies.