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The Prevalence of Delinquency in Depressed and Substance Abusing Adolescent Girls

Susan C. Hunt

THE PREVALENCE OF DELINQUENCY IN DEPRESSED AND SUBSTANCE

ABUSING ADOLESCENT GIRLS

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THE PREVALENCE OF DELINQUENCY IN DEPRESSED AND SUBSTANCE

ABUSING ADOLESCENT GIRLS

This Dissertation, by **SUSAN C. HUNT**, has been approved by the committee members signed below who recommend that it be accepted by the faculty of Antioch University Seattle at Seattle, WA in partial fulfillment of requirements for the degree of

DOCTOR OF PSYCHOLOGY

_____ Accepted: _____
Molly Reid, Ph.D., ABPP   Patricia Linn, Ph.D.
Dissertation Chairperson   Chairperson, Doctor of Clinical
                                                            Psychology Program, AUS

Clinical Dissertation Committee Members:

_____
Patricia Linn, Ph.D.

_____
Patricia O'Hagan, Ph.D.

_____
Date

ABSTRACT

THE PREVALENCE OF DELINQUENCY IN DEPRESSED AND

SUBSTANCE ABUSING ADOLESCENT GIRLS

SUSAN C. HUNT

Antioch University Seattle

Seattle, WA

Research conducted on the role of depression in delinquency among adolescent girls has found that depression can predict delinquency. It has been indicated that research should be conducted on how substance use and abuse play a role in depression and delinquency. Several studies have been conducted on adolescent girls in juvenile delinquent centres and institutions. Few studies have sampled subjects from community-based resources, i.e., street youth clinics, youth programs, or alternative schools.

The central goal of the study was to explore delinquency in a group of depressed and substance-abusing adolescent girls in community-based settings including street clinics, youth programs, and alternative schools. Specific questions focused on examining the relationship among depression, delinquency, and substance use for adolescent girls, and the prevalence of 12 risk factors (i.e., thought problems, ADHD, rule behaviours, anxiety, aggression, attitude problems, externalized behaviours, self-esteem, social problems, and somatic complaints).

Using a cross-sectional research design, the relationship among depression, substance use, and delinquency, as well as risk factors were examined for adolescent girls from community-based agencies and alternative schools. The participants included 100 adolescent girls, aged 13 to 18 years (mean age = 16.5 years). The data collection instruments that were used included the Children's Depression Inventory (CDI) (Kovacs, 1992), the Achenbach Youth Self-Report (YSR) for Ages 11-18 (ASEBA) (Achenbach,

2001), Adaptation of the Self-Reported Delinquency and Drug-Use Items as Employed in the National Youth Survey (Elliott & Ageton, 1980), and an Adolescent Self-Report Questionnaire.

The study found that adolescent girls utilizing community-based street clinics and alternative schools are diverse, varying in age, culture, sexual orientation, background, and living arrangement. Substance use and delinquency were found to have a strong, significant, positive relationship. Depression played a smaller role in the prevalence of delinquency with this sample. In addition, various risk factors were found to be related to substance abuse (as a predictor for delinquency), including rule behavior, self-esteem, somatic complaints, and externalized problems. The strong relationships among substance abuse, delinquency, and risk factors have implications for prevention and treatment programs, supporting the inclusion of evidenced-based drug and alcohol programs that focus on positive coping strategies for problem solving and emotional regulation for at-risk adolescent girls.

The electronic version of this dissertation is at OhioLink ETD Center, www.ohiolink.edu/etd.

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I would like to thank Elliott and Ageton for giving me permission to use an adaptation of their delinquency and drug-use survey. In addition, I would like to thank my research assistant, Trina Wright, for helping me score all of the assessment protocols. Finally, I would like to thank my parents, family, and friends for their encouragement throughout my post-secondary and graduate training. Most of all, I am grateful for my husband, Aaron, for being supportive to me at every step along the way.

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Introduction

This research study explored the prevalence of delinquency in depressed and substance abusing adolescent girls from various community-based agencies. Specifically, it focused on answering the following research questions: Is there a relationship among depression, delinquency, and substance use for adolescent girls?; What is the relationship between delinquency and substance use for adolescent girls?; What is the relationship between delinquency and depression for adolescent girls?; What is the relationship between depression and substance use for adolescent girls?; and, What is the relationship among various risk factors (i.e., thought problems, ADHD, rule behaviours, anxiety, aggression, attitude problems, externalized behaviours, self-esteem, social problems, and somatic complaints), and delinquency, depression, and substance use for adolescent girls?

Purpose of the Study

The purpose of this study was to determine the relationship among delinquency, depression, and substance use for adolescent girls. Further, it explored how 12 risk factors were related to the prevalence of delinquency among depressed and substance using adolescent girls.

Significance of the Study

This study contributes to the knowledge about the relationship among delinquency, substance use, and depression in adolescent girls. In addition, it helps in the identification of risk factors among adolescent girls. This leads to the formulation of recommendations, interventions, treatment, and prevention strategies for clinicians who work with adolescent girls who present with these problem areas.

Literature Review

Definitions

<u>Adolescent</u> – An individual in the state of development between puberty and maturity, that is, between 13 and 18 years of age.

<u>Delinquency</u> – Antisocial, illegal, criminal, or mischievous behaviour that deviates from social norms. Examples include: running away, stealing, shoplifting, cheating, lying, fire-setting, selling or using illegal drugs or alcohol (under-age drinking), destroying property (i.e., graffiti), breaking and entering (i.e., into cars or homes), engaging in mischief, verbal, physical, or sexual assault, fighting with others, suspension or expelled from school, engaging in gang activity, owning, carrying, or using weapons (i.e., knife, pepper spray, or pellet gun), being oppositional towards authority (i.e., teachers, parents, or police), engaging in prostitution, gambling, fraud, threatening, prank calling, arrested or charged by police, or using fake identification (Elliott & Ageton, 1980).

<u>Depression</u> – Adapted from the American Psychiatric Association's (2000) Diagnostic and Statistical Manual of Mental Disorders, fourth edition, text revision (DSM-IV-TR) are the following symptoms of depression: pervasively depressed or irritable mood (including feelings of sadness and emptiness); loss of interest or pleasure in activities; change in weight (loss, no change, or gain); increase or decrease in appetite; sleep disturbance; agitation; low energy; low self-esteem (i.e., feelings of worthlessness or inappropriate guilt); difficulty concentrating; suicidal ideation (British Columbia Ministry of Children and Family Development (MCFD), 2006). The adolescent must display five or more of these almost every day during the same two-week period. Further, the symptoms must impair the adolescent's functioning at school, home, and in relationships with others (i.e., with peers or parents). Self-report tools such as Kovacs' (1992) Children's Depression Inventory (CDI) are helpful in assessing depression in adolescents.

Substance Abuse – The excessive use of a substance, for example, alcohol or a drug (i.e., marijuana, cocaine, LSD, ecstasy, heroin, and crystal meth). It is sometimes referred to as: drug addiction, drug abuse, substance addiction, or substance dependence (APA, 2000).

Risk Factors – Characteristics or factors that contribute to or increase the likelihood of an adolescent engaging in particular behaviours or developing certain problems/issues. Examples include: problems with attention, thoughts, attitude, aggression, anxiety, following rules, having externalized problems, and low self-esteem (Williams & Holllis, 1999; Erikson & Butters, 2005; DeWit, Silverman, Goodstadt, & Stoduto, 1995).

Protective Factors – Characteristics or factors present in adolescents that enhance their resiliency, increase their resistance to various risk factors, and secure them against the development of particular behaviours or issues. Examples include: supportive parents, teachers, peers, or siblings, engaging in extra-curricular activities, good school performance, regular religious practice, and media literacy (Pedersen, 1994; Beitchman, Adlaf, Atkinson, Douglas, Massak, & Kenaszchuk, 2005).

Overview of Depression in Adolescence

In British Columbia (B.C.), approximately 35,000 children and youth each year experience symptoms of depression that are consistent with the DSM-IV-TR (American Psychiatric Association, 2000) criteria. This finding is based on research conducted by the British Columbia Ministry of Children and Family Development (MCFD) (2006) that found that the approximate 6-month prevalence of childhood and adolescent depression is 3.5% of the North American population aged five to 17 years. The rate of depression is higher among adolescents where 25% may experience a depressive episode by the age of 18 years (MCFD, 2006).

The term *depression* has been used in adolescent research literature to describe "a continuum of affective disturbances that include dysphoric mood and a syndrome or cluster of symptoms of psychological distress" (Galambos, Leadbeater & Barker, 2004, p. 16). A study conducted by Galambos, et al. (2004) used longitudinal data from 1322 adolescents (648 males and 674 females) aged 12 to 19 years. The research sample had participated in three stages of Canada's National Population Health Survey (1994, 1996, and 1998). The purpose of the research was to determine gender differences in risk factors for depression in adolescents.

Various research measures were used in Galambos, et al.'s (2004) study. These included: Questions from the Composite International Diagnostic Interview (CIDI), the Body Mass Index (BMI), a Social Support Index, and a Frequency of Smoking Scale. The results of the study indicated that "although there was not a statistically significant increase in depressive symptoms in early adolescence, there was a robust gender difference in the levels of depression" (Galambos, et al., 2004, p. 20). In particular, the researchers found that girls were more affected by depression than boys. Further, it was found that over time, low levels of social support and high levels of smoking were both related to increases in symptoms of depression (Galambos, et al., 2004).

Schoenback, Kaplan, Wagner, Grimson, and Miller (1983) investigated the significance and measurement of depressive symptoms in young adolescents. The participants consisted of 624 adolescents. Nineteen percent of the total number of adolescents invited to participate were not interviewed due to refusal of the parent to give informed consent or due to the refusal of the adolescent. The refusal rates were higher in middle class households than in either upper class or lower class households. The interviews were conducted in the subjects' homes. The interviews consisted of questions about sociodemographic data, physical development, sexual feelings and attitudes,

relationships with parents and peers, and depressive symptoms within the previous week (Schoenback et al., 1983).

In Schoenback et al.'s (1983) research, depressive symptom data were collected using a self-reported version of the Center for Epidemiologic Studies Depression Scale (CES-D). Reports of symptoms without regard to duration were frequent in females, ranging from 34% to 76%. The results support the feasibility of using a self-report symptom scale to measure depressive symptoms in young adolescents.

Overview of Substance Use in Adolescence

Most adolescents are exposed to various substances (e.g. alcohol, marijuana) during their youth. A study conducted by Johnston, O'Malley, and Bachman (2003) monitored the prevalence rates of substance use among adolescents. Their sample included 43,000 adolescents (both male and female) in the 8th, 10th and 12th grades. They found that alcohol was the most common substance used among adolescents in all three grades. Use of cigarettes and marijuana was also common among all adolescents.

In terms of prevalence, or lifetime use of substances, alcohol was used by approximately 50% of 8th graders, 65% of 10th graders, and almost 80%of 12th graders. Cigarettes were used by approximately 30% of 8th graders, 45% of 10th graders, and almost 60% of 12th graders. Marijuana was used by approximately 20% of 8th graders, 40% of 10th graders, and almost 50% of 12th graders. Amphetamines were used by approximately 10% of 8th graders, 15% of 10th graders, and almost 20% of 12th graders. Finally, hallucinogens were used by approximately 5% of 8th graders, 8% of 10th graders, and 10% of 12th graders (Johnston, O'Malley & Bachman, 2003).

Lewinsohn, Rohde, and Seeley (1996) studied the occurrence of alcohol consumption and prevalence of the DSM-IV symptoms of alcohol abuse/dependence in adolescents. The sample consisted of 1507 adolescents (both males and females), aged 14

to 18 years. The results indicated that three-quarters of the adolescents had tried alcohol. It was found that boys drank alcohol more frequently, drank larger amounts, and began drinking earlier than girls. Also, it was determined that girls with a diagnosis of alcohol abuse/dependence had a "significantly earlier mean age of alcohol disorder onset and were more likely to have a relapse of alcohol disorder" (Lewinsohn, Rohde & Seeley, 1999, p. 375).

McGirr (2007), a retired police officer in the metropolitan Vancouver, B.C. area, conducted research to examine the drug trends among adolescents in the lower mainland. He surveyed 5,000 secondary students, in grades eight to 12 from two large school districts, which represented both upper and middle-class communities in B.C. He found that alcohol was currently the drug of choice among adolescents, where approximately 65% of the sample reported ever using it. Marijuana was the second most popular drug, where almost 60% reported ever using it. Magic mushrooms (pscilocybin) and Ecstasy (MDMA) were the third most popular drugs, where approximately 35% of the adolescents reported ever using it. Cocaine was the fourth most popular drug, where 20% of the adolescents reported ever using it. Crystal meth (methamphetamine) was very close to cocaine in popularity, where approximately 15% of the adolescents reported ever using it. Lysergic Acid Diethilymide (LSD) was reported to be ever used by approximately 5% of the adolescents. Finally, Heroin was the least popular drug, where approximately 1 to 2% of the adolescents reported ever using it.

McGirr's (2007) research had other significant findings about drug use trends among adolescents in B.C. Firstly, he found that over the past few years, "poly" drug use has increased among adolescents. In most cases, adolescents who are using drugs frequently, i.e., more than once per week, are more likely to be using other drugs as well. Secondly, he found that alcohol and marijuana are usually used in combination with each other. For example, if an adolescent uses alcohol, they are more likely to also use marijuana. Further,

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he found that marijuana is the most seriously abused drug for students who were currently attending school.

Overview of Delinquency in Adolescence

Youth violence continues to be of great concern in Canada. In a survey of 1,520 Canadians, 71% revealed that they believe that youth crime is increasing (EKOS Research Associates, 2000, as cited in Comes, Bertrand, Paetseh & Hornick, 2003). Research conducted in this area surveyed 2,001 junior (Grades 7, 8, and 9) and senior (Grades 10, 11, and 12) high school students aged 12 to 18 in Alberta, Canada. Fifty-four percent of the sample were adolescent girls, 46% were boys. Ninety-seven percent of the adolescents sampled viewed themselves as "Canadian," and 74% indicated "White" when asked about their ethnic background. Similar to the provincial population of adolescents in Alberta, about 80% of the students were from urban centers and 20% from rural areas (Comes et al., 2003).

The adolescents completed surveys based on conduct problems, hyperactivity, and emotional problems. Various delinquency questions were asked about the prevalence of stealing, damaging property, threatening others, and violence. Overall, 44.3% of the sample reported no involvement in delinquency, and 55.7% reported being involved in at least one delinquent act in the past year (Comes et al., 2003). More boys than girls reported carrying out delinquent acts; however, more girls reported a higher rate of violence-related acts. Older adolescents (Grade 12 students) reported a higher rate of engaging in delinquent behaviours than younger adolescents (Grade 7 students). Further, it was found that adolescents who were experiencing more psychosocial problems in their lives were more likely to engage in delinquent behaviours (Comes et al., 2003).

Delinquency among adolescent girls is increasing. This population is one of the fastest growing segments of the juvenile justice population, where their arrests accounted

for 27% of total arrests during 1999. Delinquency cases involving adolescent girls increased by 83% between 1988 and 1997 (American Bar Association & National Bar Association, as cited in Leve & Chamberlain, 2004).

Ellickson, Saner, and McGuigan (1997) examined the prevalence of various violent behaviours among high school adolescents, the co-occurrence of teenage violence with other public health problems (i.e., emotional and behavioural problems), and gender differences in violence among adolescents. The researchers gathered longitudinal data from more than 4,500 high school students and dropouts (both males and females).

The results of Ellickson et al.'s (1997) study indicated that more than half of the sample of adolescents had engaged in violence (e.g. fighting, assault) during the previous year. In addition, one-fourth of the adolescents had committed predatory violence. In terms of gender differences, it was found that boys were more likely to engage in most types of violence than girls. However, both boys and girls were equally susceptible to violence within the family. It was also found that adolescents who engaged in violent behaviour were more likely to have mental health issues, use substances, drop out of school, and engage in delinquent acts. Therefore, the researchers concluded that violence among adolescents usually co-varies with both emotional and behavioural problems (Ellikson et al., 1997).

Treatment for Adolescent Girls

There is an increasing recognition of high levels of untreated mental health issues that exist among youth in custody (Dixon, Howie, and Starling, 2004). Although substance abuse has been recognized as a significant risk factor for youth in conflict with the law, Canada has very few specialized programs for this population (Erikson & Butters, 2005). Whitmore, Mikulich, Ehlers, and Crowley (2000) conducted research to investigate whether substance abuse/dependence, conduct disorder, and other psychiatric disorders improved in adolescent girls who were referred to outpatient treatment.

Adolescent girls generally have a lower prevalence of conduct disorder, ADHD, and substance use disorder, and higher depression rates than are seen in correspondingly aged males. Adolescent girl substance abusers may also have different issues relating to the role of high-risk sexual behaviour and substance use from boys (Whitmore et al., 2000). Whitmore et al.'s (2000) research hypothesized that: (1) these girls would improve in the conduct disorder and psychiatric comorbidity (ADHD, depression), but not in their substance use disorder at the follow-up, and (2) the severity of the substance use disorder and conduct disorder at follow-up would be predicted by severity of conduct disorder, substance use disorder, depression, and ADHD at both intake and post-treatment.

The participants in Whitmore et al.'s (2000) study were recruited from Synergy, a treatment program of the University of Colorado's School of Medicine for male and female adolescents with substance abuse or dependence diagnoses and behavioural disorders. The chosen adolescents were between the ages of 13 and 19 years old. They were referred by social services and juvenile justice agencies for treatment for their substance use disorders and delinquency problems.

Various assessment instruments were used in Whitmore et al.'s (2000) study. They included: the Composite International Diagnostic Interview-Substance Abuse Module (CIDI-SAM), the Comprehensive Addictions Severity Index-Adolescents (CASI-A), the Diagnostic Interview Schedule for Children (DISC), the Carroll Rating Scale for Depression, and the Peak Aggressive Incident Scale. An additional structured interview was created to ask about crimes, days in jail, detention, prison, hospital visits, and treatment in the last 6 months. Further, an estimation of socioeconomic status was conducted using Hollingshead-Redlich's two-factor index. Finally, the Wechsler Intelligence Scales were administered in order to assess level of intellectual and cognitive functioning.

At intake, among the group of girls who completed the follow-up assessment, 79% had a drug-free urine sample. These young women averaged 2.8 substance dependence

diagnoses and 16.8 dependence symptoms across all drug categories. Twenty-two percent

of them had major depression, 20% had dysthymia, and 15.6% had post-traumatic stress

disorder. This group received weekly individual and group therapy sessions addressing

their drug use and criminal behaviours, family therapy, and random urinalysis for the

duration of one year (Whitmore et al., 2000).

Whitmore et al.'s (2000) findings revealed a significant psychiatric comorbidity and

high-risk sexual activity. Depression, in particular, appeared to be strongly related to

substance use disorders in adolescent girls. Although girls' delinquency, ADHD, and

employment status improved significantly at the one-year follow-up, depression did not

improve and substance use returned to pre-treatment levels over time. Other studies

coupled with the data collected from this study suggest that, among adolescent girls,

depression may be more chronic in the context of a substance use disorder.

Working with the family as an intervention method is important because

research has found that negative parent-child relationships and poor parenting skills have

been identified as significant risk factors for criminal behaviour in adolescents (Lipsey &

Derzon, 1998). Research conducted by Latimer (2001) explored the relationship between

youth delinquency, family intervention treatment, and recidivism. He found that family

intervention treatment significantly reduced recidivism rates among young offenders

compared to those who did not undergo treatment.

Mental Health Problems Associated with Substance Use and Delinquency

It has been found that there is a co-occurrence between substance abuse and

mental disorders among adolescents. Specifically, research has indicated that mood

disorders (i.e., depression) are prominent among juvenile delinquents. Alessi, McManus,

Grapentine, and Brickman (1984) studied a population of juvenile offenders in order to

determine the prevalence of mood disorders. Seventy-one (40 boys, 31 girls) serious

juvenile offenders were interviewed using the Schedule for Affective Disorders and Schizophrenia (SADS). Other data collection instruments included: the Research Diagnostic Criteria (RDC), the Hamilton Rating Scales (HRS), the Carroll Self-Rating Scale (CSRS), the Global Rating Scale for Depression (GRS), and the DSM-III. The results indicated that 11(15%) subjects met the criteria for a major depressive disorder, 6 (8%) subjects met the criteria for a major depressive disorder in remission, and 9 (13%) met the criteria for having a minor depressive disorder.

Similar research by Chiles, Miller, and Cox (1980) used structured interviews to study 120 adolescents (both male and female), age 13, 14, and 15 years from a correctional facility. The researchers found that 23% of the subjects (juvenile offenders) met the diagnostic criteria for major depressive disorder. Further, they found that the adolescents who met the criteria for depression reported that many of their problems were related to drug and alcohol abuse. Further, many of these adolescents had a family member who was depressed or an alcoholic.

Empirical evidence has indicated that "the rates of mental health problems and disorders are relatively high among adjudicated youths, especially females" (Corneau & Lanctot, 2004, p. 251). Corneau and Lanctot (2004) assessed the prevalence rates of self-reported suicide attempts and psychological issues in young adults adjudicated for antisocial behaviours during their adolescence. The researchers also assessed gender differences in the prevalence rates of mental health problems and disorders within their sample.

In terms of methodology, structured interviews were conducted on three separate occasions. The interviews assessed personal and social adaptation. The sample included 292 adjudicated males and 113 female youths. The mean age of the subjects was 15 years at the first interview. The results of this study indicated that over 10% of males and 20% of females with a history of juvenile delinquency reported suicide attempts. One-fifth of the subjects reported receiving psychological consultation. Further, a small number of subjects

reported psychiatric hospitalization and/or drug addiction counselling (Corneau & Lanctot, 2004).

Calhoun (2001) examined the behavioural and emotional differences between male and female juvenile offenders. The subjects included 44 girls and 44 boys (total sample of 88 juvenile offenders), who were receiving counselling as a result of a judicial request or order. The research methods included using the Behavioral Assessment System for Children (BASC), a self-report personality inventory. The research findings indicated that the female juvenile offenders reported psychological, emotional, and behavioural issues that were significantly different than the issues reported by the male juvenile offenders (Calhoun, 2001).

Specifically, the two groups (male and female juvenile offenders) differed on 6 of the 14 comparisons. These included: anxiety, depression, locus of control, social stress, relation with parents, and self-esteem. Of importance, the female juvenile offenders reported a higher external locus of control than did the males. In addition, the female juvenile offenders demonstrated higher levels of anxiety, depression, and social stress than the males. Further, the females reported feeling less valued by their families and lower self-esteem than the males. The findings of Calhoun's (2001) research provided support for additional research addressing the needs of female juvenile offenders.

Substance abuse has been found to be related to elevated depressive symptoms in adolescence. Poulin, Hand, Boudreau, and Santor (2005) studied gender differences among Canadian adolescents, and the association between substance use and elevated depressive symptoms. Using a depression self-report survey, 12,771 adolescents from various public junior and high schools were sampled. The mean age of the sample was 15.2 years. They found that the prevalence of elevated depressive symptoms was 8.6% in girls and 2.6% in boys.

Poulin et al.'s (2005) research found significant gender differences in terms of the association between substance use and depressive symptoms. Specifically, they found that alcohol and cigarette use were found to be independent predictors of increased symptoms of depression in only females. In addition, cannabis use was found to be an independent predictor of increased symptoms of depression in both males and females" (Poulin et al., 2005). Therefore, it is important to note that adolescent girls who use substances might be more at risk of developing depression than boys.

The association among depression, alcohol, and substance use was also studied by Deykin, Levy, and Wells (1987) who sampled 424 college students aged 16 to 19 years (both males and females). The researchers used the Diagnostic Interview Schedule to determine the prevalence of major depressive disorder (MDD), alcohol, and substance use in adolescents. They found that the prevalence of MDD was 6.8 %. The prevalence of alcohol abuse was 8.2%. The prevalence of substance abuse use was 9.4 %. Further, they found that alcohol abuse was associated to MDD, but not to other psychiatric disorders. Substance abuse was associated to MDD as well as other psychiatric disorders. In addition, they found that the onset of MDD in adolescents frequently preceded alcohol or substance abuse (Deykin et al., 1987).

In similar research by Shrier, Harris, Kurland, and Knight (2003), they studied the relationship between substance abuse disorders and mental disorders in adolescence further by examining how less severe substance use problems (SUP's) also increase risk. They studied 538 adolescents (68% female), aged 14 to 18 years, who were receiving routine care at a hospital-based adolescent clinic. The following data collection instruments were used: the Problem Oriented Screening Instrument for Teenagers Substance Use/Abuse Scale and the Adolescent Diagnostic Interview.

The results of Shrier et al.'s (2003) research indicated that 66% were classified with non-problematic substance use (NSU), 18% with less severe substance abuse problems

(SUP), and 16% with substance abuse disorders (SUD). Further, 80% of the subjects reported having at least one psychiatric symptom in the last year. In terms of prevalence of mental disorders among this population, anxiety symptoms were the most common (60% of both girls and boys). Further, symptoms of depression were prevalent (51%) among adolescent girls and attention-deficit disorder symptoms were prevalent (47%) among adolescent boys.

Smart and Walsh (1993) examined the extent of depression and other psychiatric disorders and symptoms among adolescent street youth in Canada. The goal of the study was to extend the knowledge of street youth by identifying the association of various factors, i.e., depression, alcohol and drug use, social supports, self-esteem, family background, and alcohol and drug use among family members. The sample consisted of 145 adolescent street youth, 24 years and younger, who were given various questionnaires to complete (e.g., the Center for Epidemiological Studies Depression Scale, CES-D, the Rosenberg Self-Esteem Scale, the CAGE alcohol problem scale, and the Drug Abuse Screening Test) and underwent interviews.

The results indicated that among street youth, only self-esteem, social support, and time spent in a hostel were clearly related to depression (Smart & Walsh, 1993). Further, the youth who had parents using drugs was related to them leaving home. When the researchers conducted a regression analysis, they found that social support was no longer important while depression was found to be most prevalent among the adolescents with low self-esteem and who spent the most time in hostels. Smart and Walsh (1993) predicted that depression would be greatest among those adolescents who used drugs heavily or had alcohol or drug problems. However, although the researchers found that street youth have high rates of both drug use and depression, there was no relationship between depression and any of the alcohol or drug-use variables studied. Further, they found that high self-

esteem and high levels of social support protected the subjects against depression. However, family stability was not an important factor in this regard (Smart & Walsh, 1993).

DeSimone and Murray's (1994) research indicated that alcohol use and misuse are positively associated with depression and low self-esteem in high school and college students. Their study included a sample of 140 high-school students (55 males and 85 females; mean age of 15.7), 53 college students aged 18-20 years (21 males and 32 females; mean age of 19.3), and 33 college students aged 21 years and older (14 males and 19 females; mean age of 23.2). The participants were administered three assessment instruments: the Adolescent Alcohol Involvement Scale (Moberg, 1983), the Rosenberg (1965) Self-Esteem Scale, and the Beck Depression Inventory (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961).

The results of DeSimone and Murray's (1994) study indicated that, for high school students, the frequency of drinking was associated with depression (Pearson $r = 0.23$, $p <$ .01). Participants who drank more often were more depressed. Further, it was found that depression and self-esteem scores were negatively associated ($r = -0.59$, $p < .001$). Participants who were more depressed had lower self-esteem. These findings were consistent among all ages and genders.

Whitmore, Mikulich, Ehlers, and Crowley (2000), in their study investigating one-year outcomes of adolescent girls referred for depression, found that depression was strongly related to substance use disorders. Other studies coupled with the data collected from this study suggest that, among adolescent girls, depression may be more prevalent in the context of a substance use disorder.

Dixon et al. (2004) studied the psychopathology in female juvenile offenders. Further, they examined the relationship among mental health and sociodemographic, family, and trauma. Their sample consisted of one hundred juvenile incarcerated offenders, aged 13.5 to 19 years, from a juvenile detention centre in Sydney, Australia. The ethnic

distribution was predominantly Aboriginal (48%) and Caucasian (33%). Two assessments were used in the study: the Schedule for Affective Disorders and Schizophrenia for School-Age Children – Present and Lifetime Version (K-SADS-PL), and the Family Adaptability and Cohesion Scale II (FACES II) self-report measure.

The results of the Dixon et al.'s (2004) quantitative study indicated that rates of psychopathology were higher for offenders than non-offenders (p < .001). The highest rates were in adolescent girls with conduct disorder, substance abuse disorder, depression, and posttraumatic stress disorder. Among the offenders, 75% met the criteria for three or more diagnoses. Therefore, it was found that "there is a high prevalence of psychological disorder in females in juvenile justice custody" (Dixon et al, 2004, p. 1150).

Risk and Protective Factors for Substance Abuse and Delinquency

There are many theories that attempt to explain why certain adolescents engage in substance use or delinquent behaviours. One of the leading theories suggests that when adolescents encounter stressful situations and do not have appropriate coping skills, they may manage their feelings by using substances or engaging in maladaptive behaviours (Burrow-Sanchez, 2006). Regardless of the various theoretical views about the etiology of substance abuse and delinquency, most people agree on the influence of risk and protective factors related to the development of these problems in adolescents.

Lederman, Dakof, Larrea, and Li (2004) conducted a study to better understand the social and psychological characteristics of adolescent girls in juvenile detention, as there had been a recent increase in the arrest and incarceration of adolescent girls. This study focused on six important features of delinquent and incarcerated girls: (1) family dysfunction, (2) trauma and sexual abuse, (3) mental health and substance abuse problems, (4) high-risk sexual behaviours, (5) school problems, and (6) affiliation with deviant peers. The

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participants consisted of 493 girls, aged 10 to 17 years, who were in a short-term juvenile detention facility.

The adolescent girls in Lederman et al.'s (2004) study were placed in a short-term juvenile detention facility after a preliminary hearing while waiting for trial or placement in a long-term residential correction facility. The girls were administered structured interviews. The interview questions consisted of demographic information as well as background characteristics of the girls and their families. The girls' experiences were then assessed in the following areas: family functioning, trauma and sexual abuse history, physical health, delinquent behaviour and gang involvement, education, mental health and substance use history, sexual activity, and peer relationships. For 66% of the girls, the current detainment was the first time being detained but not their first time arrested. Fifty-four percent of the sample currently was detained for a violent crime, and 69% reported that at some point in their lives, they were arrested for physically hurting someone.

Lederman et al.'s (2004) study then examined the differences in functioning between girls experiencing their first detainment in comparison to those who had been previously detained. Girls who had been detained previously reported more family problems. There were no differences between the two groups on the following family variables: family configuration, mother's education, or the presence of family drug and mental health problems or criminal justice involvement. There were no differences between the two groups on any of the trauma-related variables. The girls who had been previously detained reported more substance use. However, both groups were found to also be likely to have a current substance abuse disorder. The girls who had been previously detained were significantly more likely to be sexually active. There were no differences on age of first sexual experience, number of sexual partners in the last three months, condom use, contraceptive use, or pregnancy rates.

Lederman et al. (2004) also found that both groups of girls liked school. However, the girls who had been detained previously had lower GPA's and lower educational aspirations. Further, it was found that the girls who were previously detained had been arrested more frequently and were younger at the age of their first arrest and first detention. There were no differences between the two groups on reasons for arrest (Lederman et al., 2004). In addition, it was found that a very large percent of the girls had experienced significant trauma in their lives, suffered from mental health and substance abuse disorders, had serious family problems, affiliated with deviant peers, and were sexually active (Lederman et al., 2004).

Similarly, research by Keller, Catalano, Haggerty, and Fleming (2002) found that children and adolescents with drug-dependent parents are at an increased risk for drug use, and engaging in delinquent and other problem behaviours. In other words, "children of substance abusing parents have an elevated risk for experiencing disruptions in household composition and for engaging in problem behaviours" (Keller et al., 2002, p. 400). Of importance, their study found that adolescent girls had an increased likelihood of drug use as their number of family conflicts increased.

Williams and Hollis (1999) conducted research in order to understand the health care needs of incarcerated adolescent girls by comparing their rates of physical complaints, health attitudes, and treatment seeking to a normative sample. The participants consisted of 138 incarcerated girls at a regional youth residential center in Georgia, U.S. Approximately two-thirds had committed felonies for which they were serving sentences of 6 months or more. The other one-third was incarcerated for a maximum of 90 days owing to repeated status offences or misdemeanours.

Williams and Hollis's (1999) study found that the majority of the participants came from problematic home environments and had experienced sexual and/or physical abuse, and had exposure to inadequate functioning adult models as measured by responses on the

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following instruments: the Somatic Symptom Checklist (SSC), Illness Attitudes Scales (IAS), and the Reynolds Adolescent Depression Scale (RADS). The SSC examines lifetime prevalence of 27 physical symptoms included in the DSM Somatization Disorder. The IAS examines attitudes toward illness and health. These questions were rated on a five-point Likert scale (0 = "no" to 4 = "most of the time"). The RADS assesses positive psychopathological signs of depression in adolescents, also rated on a four-point Likert scale (1 = "almost never" to 4 = "most of the time") (Williams & Hollis, 1999).

The surveys were administered to the participants during a course of one week. The scores from the SSC and the IAS were compared with those of a normative sample of adolescent girls. The most common reported symptoms included: dizziness, heart pounding, chest pains, and nausea; the least common symptom was deafness. All of these symptoms were significantly more frequently endorsed compared to the normative sample (with exception to deafness, trouble walking, loss of feeling in arm or leg, and lump in throat). Percentile scores on the RADS showed a significant linear relationship (positive correlation) to total symptoms endorsed on the SSC. Symptoms of depression and physical ailment increased syntonically. The length of incarceration did not show a relationship with the depression scores, and the level of depression did not differ significantly with age (Williams & Hollis, 1999).

A great amount of research indicates that adolescents at risk of becoming youth crime statistics share many commonalities within their families, peer groups, schools, and neighbourhoods. Some of these characteristics include: low levels of affection and bonding by parents, abuse, isolation, antisocial peer group, low academic achievement, and social disorganization (Erikson & Butters, 2005). However, according to Erikson and Butters (2005) there is no single risk factor (e.g., drug use) that can adequately explain delinquency in youth.

DeWit, Silverman, Goodstadt, and Stoduto (1995) applied the "risk factor approach" to assess the influence of protection and risk on five measures of substance abuse. These were: overall involvement in drugs, frequent alcohol use, frequent illegal drug use, frequent drug abuse, and quantity of daily cigarette consumption (DeWit et al., 1995). The subjects included 400 grade nine students from seven high schools in Toronto, Canada. Each subject completed a self-report questionnaire, a screening instrument that identified high risk youth during the transition years (students in grade nine and 10).

DeWit et al. (1995) study's findings support the risk factor approach to adolescent drug use. The researchers found that "the frequency or occurrence of various categories of drug use (i.e., cigarette, alcohol, and illegal drug use) was predicated by a multiplicity of factors; the greater the number of risk factors to which an adolescent was exposed, the greater the likelihood he or she used/abused alcohol and other drugs" (DeWit et al., 1995, p. 848).

Specifically, the researchers identified various risk and protective factors for frequent drug abuse. Risk factors identified include: early drug use and antisocial behaviour, negative life events (i.e., family conflict), parent and sibling drug use, family criminal behaviour, school failure, poor social skills, and early association with delinquent and drug-using peers). Protective factors identified include: law conformity, religious affiliation, high self-esteem, low levels of depression, high grade point average, and positive family relationships (DeWit et al., 1995).

In terms of identifying various risk and protective factors that are important to consider for adolescents, Pedersen (1994) conducted research examining the relationship among depression, anxiety, delinquency, and general and non-specific risk factors to a range of psychosocial problems. This research used a shortened, 20-item version of the Parental Bonding Instrument (PBI) which measure mothers' and fathers' "care" and "control/overprotection" as perceived by the adolescent. The sample included 267 boys and

306 girls, aged 15-19 years from various secondary schools in Oslo, Norway. The data was collected from the longitudinal study "Youth, Lifestyle, and Drugs" (Pedersen, 1990, 1991a, 1991b, as cited in Pedersen, 1994).

Mental health was measured using the General Health Questionnaire 12 (GHQ 12), which measures anxiety, depression, and social functioning (Pedersen, 1994). Delinquency was measured by six questions related to "truancy from school, shoplifting, and contact with the police" (Pedersen, 1994, p. 975). Using the two dimensions of the PBI, it was found that both factors, i.e., mothers' and fathers' "care" and "control/overprotection" as perceived by the adolescent, were related to measures of depression, anxiety, and delinquency. Therefore, this research shows that the aforementioned factors and PBI scores "may indicate general and non-specific risk factors in a broad range of psychosocial problems" (Pedersen, 1994, p. 975).

It has been found that social support can reduce the adverse psychological impact of stressful life events and lower the risk of mental health issues (Beitchman, Adlaf, Atkinson, Douglas, Massak & Kenaszchuk, 2005). Further, research has indicated that positive peer relations are associated with lower levels of depression but positively related to substance abuse (Aseltine, Gore & Colten, 1998, as cited in Beitchman et al., 2005). In their research, Beitchman et al. (2005) explored how measures of risk and perceived social support "relate to different configurations of adolescent psychopathology" (p. 124).

Beitchman et al. (2005) used data from a community-based longitudinal study in Toronto, Ontario, which sampled 284 children and adolescents. The subjects were studied at the age of 5 years and then again at the age of 19 years. Various methods were used including: self-report questionnaires, standardized tests, and structured interviews. The researchers found that the drug abusers they studied reported less perceived family support. Further, they had a greater number of early risk factors, i.e., poor parent maternal adjustment and maternal depression. In addition, "the most distinctive risk for co-occurring

depression and substance abuse was that of low family support" as well as poor family functioning (Aseltine, Gore & Colten, 1998, as cited in Beitchman et al., 2005, p. 135). Further, it was found that low social support from both family and peers was prevalent amongst the adolescent's with depression and stress-related disorders (Beitchman et al., 2005).

Rationale for the Study

It is apparent that several studies have been conducted on adolescent girls in juvenile delinquent centres and institutions. Few studies have sampled subjects from community-based resources, i.e., street youth clinics, youth programs, or alternative schools. Research conducted on the role of depression in delinquency among adolescent girls reveals that "depression can predict antisocial behaviour among girls" and "the experience of depression during adolescence is hypothesized to be a central pathway through which girls' serious antisocial behaviour develops for several reasons" (Obeidallah & Earls, 1999, p. 1). However, not all girls who are depressed become antisocial. It is also believed that many chronic, serious female offenders experienced depression as adolescents (Obeidallah & Earls, 1999). These researchers indicated that future research should be conducted on how substance use and abuse play a role in depression and antisocial behaviour. Therefore, it is important to determine the prevalence and risk factors in order to predict the role of depression and substance use in adolescent girls who engage in delinquent behaviour.

Among the juvenile delinquent population, the prevalence of depression is 10% to 30% (Duclos et al., 1998, as cited in Ritakallio, Kaltiala-Heino, Kivivuori, Luukkaala & Rimpela, 2006). Similar results have been also found among adolescent samples in the community (Loeber et al., 1999, as cited in Ritakallio et al., 2006). Ritakallio et al. (2006) report it is well established that depression is closely connected to adolescent delinquency.

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However, there is a gap in the literature surrounding the links among depression in adolescent girls, substance use, and delinquency. Further, there is little research that links the aforementioned factors with various risk factors in adolescent girls that may be related to them engaging in delinquent behaviours.

The research conducted by Beitchman et al. (2005) indicated that family conflict is linked with delinquency. However, risk factors, i.e., anxiety, low self-esteem, social problems, ADHD, externalized problems, aggression, and somatic problems have not been studied with this population. According to Dixon et al. (2004), "a greater understanding of the pathways to female antisocial behaviour is needed to inform early intervention and preventative planning" (p. 1157).

Research Questions

The research questions were as follows:

1) Is there a relationship among depression, delinquency, and substance use for adolescent girls?

2) What is the relationship between delinquency and substance use for adolescent girls?

3) What is the relationship between delinquency and depression for adolescent girls?

4) What is the relationship between depression and substance use for adolescent girls?

5) What is the relationship among various risk factors (i.e., thought problems, ADHD, rule behaviours, anxiety, aggression, attitude problems, externalized behaviours, self-esteem, social problems, and somatic complaints), and delinquency, depression, and substance use for adolescent girls?

Hypotheses

The research hypotheses were as follows:

- Null Hypothesis (H0): There are no significant relationships among depression, delinquency, and substance use for adolescent girls.

- Hypothesis 1 (H1): There is a significant positive relationship between delinquency and substance use for adolescent girls.

- Hypothesis 2 (H2): There is a significant positive relationship between delinquency and depression for adolescent girls.

- Hypothesis 3 (H3): There is a significant positive relationship between depression and substance use for adolescent girls.

- Hypothesis 4 (H4): There is a significant positive relationship among depression, delinquency, and substance use for adolescent girls.

- Null Hypothesis (H0): There are no significant relationships among various risk factors (i.e., thought problems, ADHD, rule behaviours, anxiety, aggression, attitude problems, externalized behaviours, self-esteem, social problems, and somatic complaints), and delinquency, depression, and substance use for adolescent girls.

- Hypothesis 5 (H5): There are significant positive relationships among various risk factors (i.e., thought problems, ADHD, rule behaviours, anxiety, aggression, attitude problems, externalized behaviours, self-esteem, social problems, and somatic complaints), and delinquency, depression, and substance use for adolescent girls.

Method

Overview

This quantitative research study was a cross-sectional survey design that included four self-administered questionnaires. The purpose of this research was to determine the relationships among delinquency, depression, and substance use for adolescent girls. In addition, various risk factors were identified among adolescent girls who are having difficulties in these problem areas.

Participants

Participants included 100 adolescent girls between the ages of 13 to 18 years. A random sample of subjects was selected from various youth clinics, agencies, and schools using a random numbers table. All adolescent girls who attended the selected youth clinics, schools, and agencies had an equal chance of being recruited and participating in the study. At the time of the study, the researcher had no prior knowledge of the participants' mental health issues, substance use, socio-demographic information, or delinquent behaviours. Participants received a five-dollar gift card as recompense for their participation in the study.

The subjects were selected from the following youth clinics, agencies, and schools: Purpose Youth Clinic (drop-in centre in New Westminster, B.C.), Youth Programs at Purpose Society (in New Westminster and Burnaby, B.C.), Cedars Adolescent Treatment Centre (residential treatment facility for adolescent girls with substance use issues in Burnaby, B.C.), Edmonds Youth Clinic (drop-in centre in Burnaby, B.C.), Purpose School (alternative school for adolescents in New Westminster, B.C.), and the Coquitlam Alternate Basic Education (CABE) Program (in Coquitlam, B.C.). These locations were chosen because adolescents from these schools, programs, and drop-in centres vary in terms of their ethnic background, socioeconomic status, and geographical location in the lower mainland of British Columbia (B.C.). These agencies are all community-based, i.e., from

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school districts, youth clinics, or treatment centres. Community-based programs were chosen so that a wide range of adolescents could be sampled to represent adolescent girls living within various B.C. communities.

Measures

There were four data collection instruments used in this study. The adolescent girls completed all assessments and surveys concurrently. These included:

Children's Depression Inventory (CDI) (Kovacs, 1992) - A standardized 27-item self-report assessment that quantifies various depressive symptoms. These include: disturbed mood, problems with vegetative functions, low self-esteem, feelings of hopelessness, and problems with interpersonal behaviours. On this instrument, there are three choices for each item, which correspond to three levels of symptomatology. These include: 0 (absence of symptom), 1 (mild symptom), and 2 (definite symptom). Adolescents select the statement that best describes them in the past two weeks. Higher scores indicate increasing depression severity. The total score ranges from 0 to 54 (Kovacs, 1992).

Reliability for the CDI has been demonstrated in psychiatric and public school student samples. Reliability coefficients range from .71 to .89 for all depressive symptoms. This indicates good internal consistency of the instrument. Further, the CDI has been used in numerous clinical areas and research studies where its validity has been well established. Specifically, the CDI "assesses constructs that have strong explanatory and predictive utility in the characterization of depressive symptoms in children and adolescents" (Kovacs, 1992, p. 63).

In addition to the Total CDI score, the CDI yields scores for five factors, or subscales. These subscales are: Negative Mood (reflects feeling sad, feelings like crying, worrying, being upset, and not able to make up one's mind), Interpersonal Problems (reflects problems and difficulties in interactions with others, e.g., social isolation),

Ineffectiveness (reflects negative evaluation of one's ability and school performance),

Anhedonia (reflects "endogenous depression," loss of ability to take pleasure in activities,

loss of energy, problems with sleeping and eating, and feelings of isolation), and Negative

Self-Esteem (reflects low self-esteem, feelings of being unloved, and a tendency to have

thoughts of suicide) (Kovacs, 1992).

Achenbach Youth Self-Report (YSR) for Ages 11-18 (ASEBA) (Achenbach, 2001) -

A standardized assessment completed by youth to describe their own functioning. It

includes demographic information, and assesses conduct problems, attention problems,

depression, adaptive functioning, competencies, problems, and interpersonal relationships.

The YSR scores are divided into various scales: Competence Scale (Activities, Social, and

Academic Performance), Syndrome Scale Score (Anxious/Depressed,

Withdrawn/Depressed, Somatic Complaints, Social Problems, Thought Problems, Attention

Problems, Rule-Breaking Behaviour, and Aggressive Behaviour), Internalizing,

Externalizing, and Other Problems Scale, and DSM-Oriented Scale (Affective Problems,

Anxiety Problems, Somatic Problems, Attention Deficit/Hyperactivity Problems, Oppositional

Defiant Problems, and Conduct Problems).

On the YSR, adolescents rate their functioning by answering statements with: 0 (Not

True), 1 (Somewhat or Sometimes True), or 2 (Very True or Often True). Through various

repeated assessments, the YSR has shown inter-interviewer reliability and test-retest

reliability. Further, it has shown evidence of content validity, criterion-related validity, and

construct validity (Achenbach & Rescorla, 2001).

*Adaptation of the Self-Reported Delinquency and Drug-Use Items as Employed in

the National Youth Survey* (Elliott & Ageton, 1980) (Appendix A) - The questions from this

survey have been adapted, with permission, from Elliott and Ageton's (1980) Self-Report

Delinquency and Drug Use Survey. There are 50 questions based on the prevalence of

various delinquent and substance using behaviours. Each item is measured on a Likert

scale. The components of this scale are: 1 (Never), 2 (Once or Twice), 3 (Several Times), and 4 (Often). There is no known or available data to indicate the survey's reliability or validity.

     Adolescent Self-Report Questionnaire (Appendix B) – This survey was developed for this research study. The questions on this survey are open-ended and are based on demographics (i.e., sexual orientation, cultural background, and family composition) and various protective factors, i.e., if they are depressed, what stops them from using substances and engaging in delinquent behaviours? Sample questions include: "What stops you from using drugs or alcohol?" and "What/who helps you get through hard situations?" Reliability and validity have not been determined for this scale.

Procedure

     The researcher met with the schools, youth clinics, and agency administrators (school principals and executive directors) to discuss the details of the study. Posters were displayed at various youth clinics and schools outlining a description of the study. The researcher explained the nature of the study to potential participants and provided them with a consent form (Appendix C), which outlined the description of the research as well as ethical guidelines. The adolescent girls completed the instruments in a quiet location within the community agency or school, such as in a classroom or office. The assessment and survey forms took approximately 30 to 40 minutes for the participants to complete.

Data Analysis Plan

     Raw data were collected as interval level data where appropriate to maintain the highest level of measurement for the analysis. Data were re-coded and re-labeled as needed for the appropriate statistical analyses. Some data were converted to standard scores (T-scores). For the CDI scales, T-scores over 65 are indicative of clinically significant

depressive symptoms. Two categories of data were formed: Depressed (T-score over 65), and Non-Depressed (T-score below 65). For the YSR scales, three categories of data were formed for each subscale: Clinical Range (T-score over 70), Borderline Clinical Range (T-score between 65 and 69), and Normal (T-score below 64).

Substance Use scores were grouped together from the "Delinquency and Substance Use Survey" to form a raw score (prevalence rate). The scores fell into one of following three categories: scores between 25 and 36 indicate severe substance use problems (i.e., use substance(s) often); scores between 15 and 24 indicate moderate substance use problems (i.e., use substance(s) several times); scores below 15 indicate none or mild substance use problems (i.e., use substance(s) once or twice or never).

Delinquent behaviour scores were grouped together from the "Delinquency and Substance Use Survey" to form a raw score (prevalence rate). The scores fell into one of the following three categories: scores between 90 and 136 indicate severe delinquency problems (i.e., engage in delinquent behaviours often); scores between 50 and 89 indicate moderate delinquency problems (i.e., engage in delinquent behaviours several times); scores below 50 indicate none or mild delinquency problems (i.e., engage in delinquent behaviours once or twice or never).

Based on the ungrouped data, the raw scores on the "Delinquency and Substance Use Survey" indicated that a participant could have a minimum score of 42 and a maximum score of 168 based on a self-reporting Likert scale where a score of "1" indicates "never" to a score of "4" that indicates "often" for engaging in delinquent and substance use behaviours.

The following section describes and summarizes the statistical analyses used to examine the previously discussed research questions and hypotheses. Various quantitative procedures were conducted with the data. To determine the prevalence of delinquency in depressed and substance abusing girls as well as the risk factors involved, descriptive

statistics, frequencies, correlations, and multiple regressions were used. Specifically, descriptive statistics were used to determine the measures of central tendency for Age, Ethnicity/Cultural Background, Living Arrangement, and Sexual Orientation. Descriptive statistics were also used for the Depression, Substance Use, and Delinquency scales, as well as the risk factor scales, i.e., problems with attention, thoughts, attitude, rules, externalized behaviours, aggression, anxiety, and low self-esteem.

Frequencies were computed to analyze demographics of Age, Ethnicity/Cultural Background, Living Arrangement, and Sexual Orientation, as well as the Depression, Substance Use, Delinquency, and the risk factor scales. Bivariate correlations were used to determine the pairwise relationships between the variables (Depression, Substance Use, and Delinquency) as well as their relationships to the various risk factors. Multiple regression analyses were computed to identify the factors that best predict the variance of both the Delinquency and Substance Use variables.

Results

Descriptive Statistics for Demographics

The sample included 100 adolescent girls from various alternative schools, youth clinics, treatment programs, and drop-in clinics (N = 100). The participants ranged from 13 to 18 years (Mean Age = 16.5 years). Table 1 describes the demographic characteristics of the sample.

Table 1

Demographic Information

Demographic Variable	N=100
Age in Years (Mean, Range)	16.5 (13-18)
Living Arrangement	
Two-Parent House	43
Single-Parent House	32
Mixed Family (i.e., Step-Parents)	14
Live Alone	5
Foster Home	3
With Other Family (i.e., not biological parents)	3
Cultural Background/Ethnicity	
Caucasian	56
Aboriginal	14
Asian	7
African American	3
Latino	2
"Other"	18

Sexual Orientation

Heterosexual	85
Homosexual	2
Bisexual	12
No Answer	1

Descriptive Statistics for Main Variables

Means, standard deviations, ranges, and variances for the three main variables (Depression, Substance Use, and Delinquency) were computed and are outlined in Table 2. The mean T-Score for Total CDI (Depression) was 57.04. It is important to note that scores over 65 are indicative of symptoms of depression in the clinical range. For this study, the mean score of the participants self-identified as moderately depressed.

 The mean raw score for substance use was 22.01 indicating that this sample of girls identifies themselves as having moderate substance use problems. Substance Use scores between 25 and 36 indicate severe substance use problems. Scores between 15 and 24 indicate moderate substance use problems. Scores below 15 indicate none or mild substance use problems.

The mean raw score for Delinquency was 58.38 indicating that this sample of girls identifies themselves as having moderate delinquency problems. Delinquency scores between 90 and 136 indicate severe delinquency problems. Scores between 50 and 89 indicate moderate delinquency problems. Scores below 50 indicate none or mild delinquency problems.

In summary, for this sample of 100 adolescent girls from various youth clinics, alternative schools, and community agencies, all of their scores for the three main variables (Depression, Substance Use, and Delinquency) fell within the moderate range.

Table 2

Raw Scores for Main Variables

	N	Range	Min.	Max.	Mean	Std. Dev.	Variance
Total CDI (T-Score)	100	53	34	87	57.0	13.6	186.2
Substance Use	99	27	9	36	22.0	6.2	38.3
Delinquency	99	81	15	96	58.4	15.2	230.4

The results shown in Table 3 indicate that of the total 100 sample size for the variable Total CDI (Depression), 69% of the adolescent girls reported that they were not depressed (i.e., not in the clinical range), and 31% reported that they were depressed, i.e., had symptoms of depression in the clinical range (T-score over 65). Figure 1 provides a visual representation of the scores in the two categories (depressed versus not depressed).

Table 3

Categorical Data (Intervals) - Total CDI (T-Scores)

		Frequency	Percent
Scores	34-64 (not clinical)	69	69.0
	65-87 (clinical)	31	31.0
Total		100	100.0

Figure 1

Histogram – Total CDI

Total CDI

Not Clinical   **Clinical**
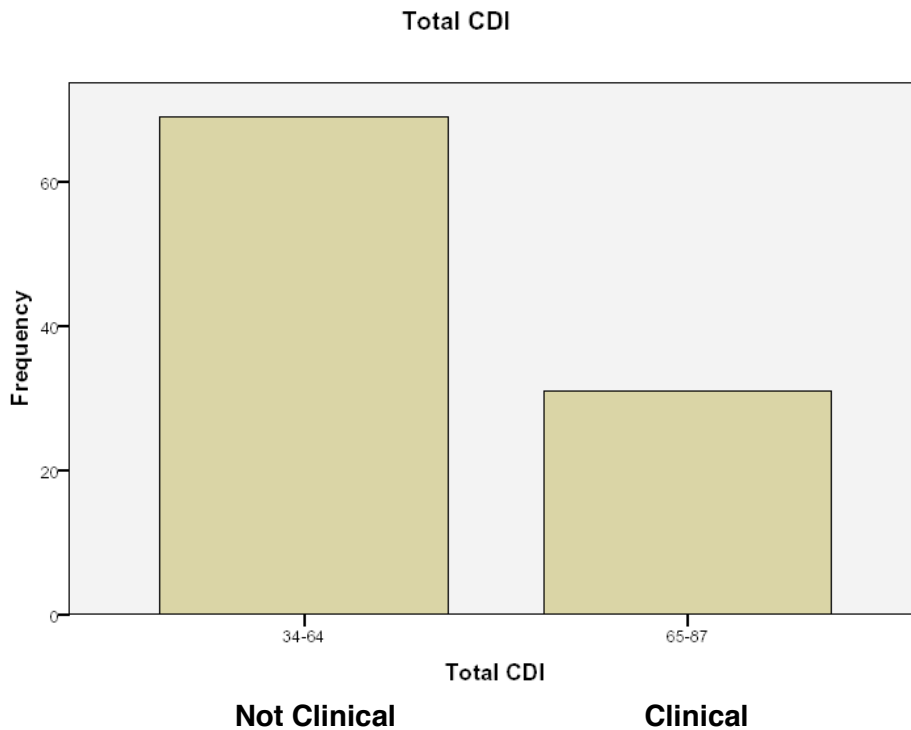
Table 4 is a description of the frequency of Substance Use for the participants. Of

the total 100 sample size, 13.1% of the adolescent girls reported that they had none or mild

substance use problems, 51.5% reported that they had moderate substance use problems,

and 35.4% reported that they had severe substance use problems. Figure 2 provides a

visual representation of the scores in the three categories (none/mild, moderate, and

severe).

Table 4

Categorical Data (Intervals) – Substance Use

		Frequency	Percent
Scores	1-14 (none or mild)	13	13.1
	15-24 (moderate)	51	51.5
	25-36 (severe)	35	35.4
Total		99	100.0

Figure 2

Histogram – Substance Use

Substance Abuse
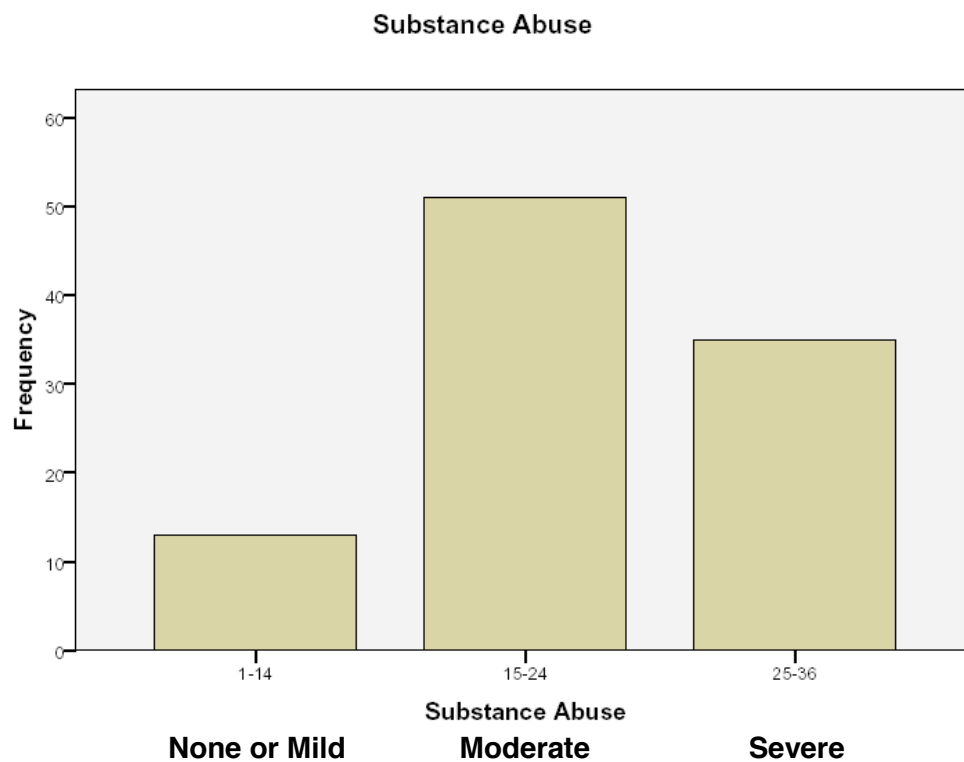
Table 5 is a description of the frequency of Delinquency for the participants. Of the

total 100 sample size, 26.3% of the adolescent girls reported that they had none or mild

delinquency behaviours, 70.7% reported that they had moderate delinquency behaviours,

and 3% reported that they had severe delinquency problems. Figure 3 provides a visual

representation of the scores in the three categories (none/mild, moderate, and severe).

Table 5

Categorical Data (Intervals) – Delinquency

		Frequency	Percent
Scores	1-49 (none or mild)	26	26.3
	50-89 (moderate)	70	70.7
	90-136 (severe)	3	3.0
Total		99	100.0

Figure 3

Histogram – Delinquency

Delinquency

None or Mild   Moderate   Severe
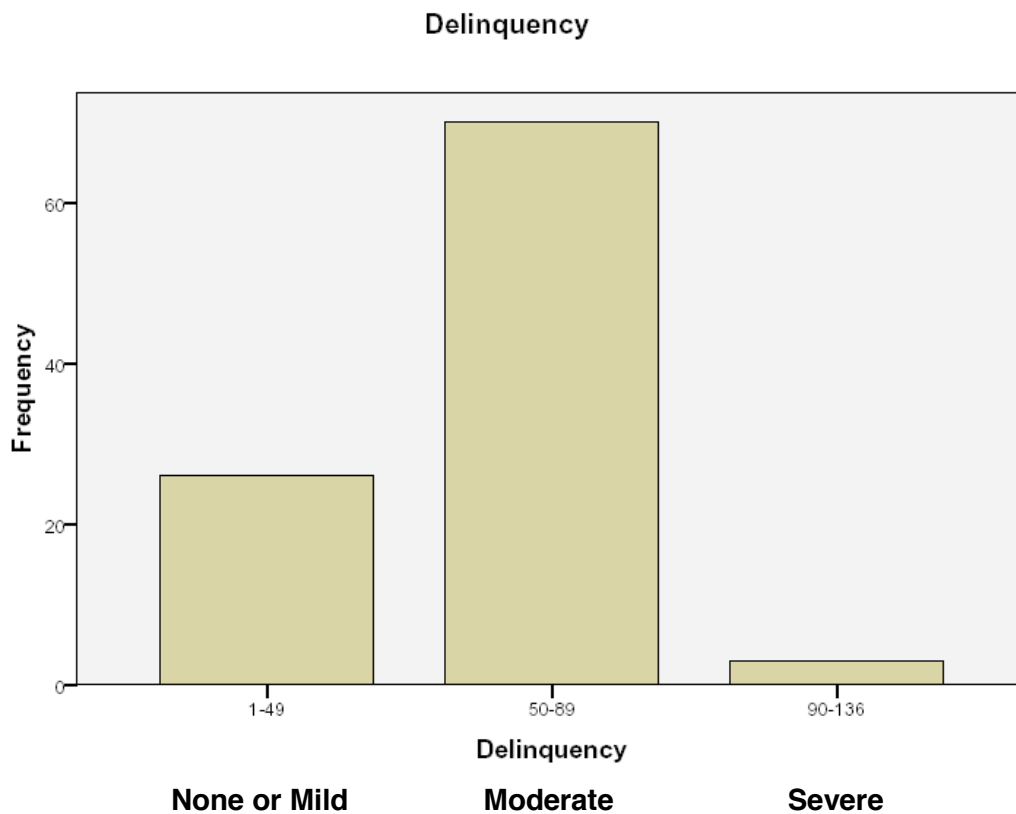
Descriptive Statistics for Culture/Ethnicity and Main Variables

In terms of Depression, 69% of girls scored in the non-clinical range, and 31% scored in the clinical range. Of the 69% in the non-clinical range, 40% were Caucasian, 1% was African American, 2% were Latino, 9% were Aboriginal, 5% were Asian, and 12% were from the culture listed as "other." Of the 31% of girls who scored in the clinical range, 16% were Caucasian, 2% were African American, 0% was Latino, 5% were Aboriginal, 2% were Asian, and 6% were from the culture listed as "other."

In terms of Substance Use, 13% of girls scored in the none or mild range, 51% scored in the moderate range, and 35% scored in the severe range. Of the 13% in the none or mild range, 4% were Caucasian, 1% was African American, 0% was Latino, 0% was Aboriginal, 3% were Asian, and 5% were from the culture listed as "other." Of the 51% of girls who scored in the moderate range, 28% were Caucasian, 2% were African American, 2% were Latino, 5% were Aboriginal, 2% were Asian, and 12% were from the culture listed as "other." Of the 35% of girls who scored in the severe range, 23% were Caucasian, 0% was African American, 0% was Latino, 9% were Aboriginal, 2% were Asian, and 1% was from the culture listed as "other."

In terms of Delinquency, 25% of girls scored in the none or mild range, 70% scored in the moderate range, and 3% scored in the severe range. Of the 25% in the none or mild range, 10% were Caucasian, 1% was African American, 1% was Latino, 2% were Aboriginal, 5% were Asian, and 7% were from the culture listed as "other." Of the 70% of girls who scored in the moderate range, 42% were Caucasian, 2% were African American, 1% was Latino, 12% were Aboriginal, 2% were Asian, and 11% were from the culture listed as "other." Of the 3% of girls who scored in the severe range, 3% were Caucasian, 0% was African American, 0% was Latino, 0% was Aboriginal, 0% was Asian, and 0% was from the culture listed as "other."

Descriptive Statistics for Sexual Orientation and Main Variables

In terms of Depression, 69% of girls scored in the non-clinical range, and 31% scored in the clinical range. Of the 69% in the non-clinical range, 62% were Heterosexual, 0% was Homosexual, and 6% were Bisexual. Of the 31% in the clinical range, 23% were Heterosexual, 2% were Homosexual, and 6% were Bisexual.

In terms of Substance Use, 13% of girls scored in the none or mild range, 51% scored in the moderate range, and 35% scored in the severe range. Of the 13% in the none or mild range, 11% were Heterosexual, 0% was Homosexual, and 2% were Bisexual. Of the 51% in the moderate range, 42% were Heterosexual, 0% was Homosexual, and 8% were Bisexual. Of the 35% in the severe range, 31% were Heterosexual, 2% were Homosexual, and 2% were Bisexual.

In terms of Delinquency, 25% of girls scored in the none or mild range, 70% scored in the moderate range, and 3% scored in the severe range. Of the 25% in the none or mild range, 22% were Heterosexual, 0% was Homosexual, and 3% were Bisexual. Of the 70% in the moderate range, 59% were Heterosexual, 2% were Homosexual, and 9% were Bisexual. Of the 3% in the severe range, 3% were Heterosexual, 0% was Homosexual, and 0% was Bisexual.

Descriptive Statistics for Living Arrangements and Main Variables

In terms of Depression, 69% of girls scored in the non-clinical range, and 31% scored in the clinical range. Of the 69% who scored in the non-clinical range, 32% were from two-parent homes, 23% were from one-parent homes, 8% were from mixed homes, 2% lived alone, 2% lived in foster homes, and 2% lived with other family members. Of the 31% who scored in the clinical range, 11% were from two-parent homes, 9% were from one-parent homes, 6% were from mixed homes, 3% lived alone, 1% lived in foster homes, and 1% lived with other family members.

In terms of Substance Use, 13% of girls scored in the none or mild range, 51% scored in the moderate range, and 35% scored in the severe range. Of the 13% of girls who scored in the none or mild range, 7% were from two-parent homes, 5% were from one-parent homes, 0% was from mixed homes, 1% lived alone, 0% lived in foster homes, and 0% lived with other family members. Of the 51% who scored in the moderate range, 19% were from two-parent homes, 15% were from one-parent homes, 9% were from mixed homes, 3% lived alone, 3% lived in foster homes, and 2% lived with other family members. Of the 35% who scored in the severe range, 17% were from two-parent homes, 11% were from one-parent homes, 5% were from mixed homes, 1% lived alone, 0% lived in foster homes, and 1% lived with other family members.

In terms of Delinquency, 26% of girls scored in the none or mild range, 70% scored in the moderate range, and 3% scored in the severe range. Of the 26% who scored in the none or mild range, 13% were from two-parent homes, 9% were from one-parent homes, 3% were from mixed homes, 1% lived alone, 0% lived in foster homes, and 0% lived with other family members. Of the 70% who scored in the moderate range, 29% were from two-parent homes, 22% were from one-parent homes, 11% were from mixed homes, 4% lived alone, 3% lived in foster homes, and 1% lived with other family members. Of the 3% who scored in the severe range, 1% was from two-parent homes, 0% was from one-parent homes, 0% was from mixed homes, 0% lived alone, 0% lived in foster homes, and 2% lived with other family members.

Descriptive Statistics for Risk Factors

Means, standard deviations, ranges, and variances for the various risk factors are outlined in Table 6. Scores over 65 indicate problems in the borderline or clinical ranges. From these scores, it is apparent that the adolescent girls who participated in this study had difficulty with Externalized Problems (Mean T-Score = 62.82). These included problems

with following rules (Mean T-Score for Rule Behaviour = 66.39), obeying authority figures

(Mean T-Score for Oppositional Problems = 60.44), Aggressive Behaviours (Mean T-Score

= 60.74), and ADHD (Mean T-Score = 61.46).

Table 6

Descriptive Statistics and T- Scores for YSR Variables (Risk Factors) (N=100)

Risk Factor	Range	Min.	Max.	Mean	Standard Deviation	Variance
Self Esteem	44	39	83	51.0	10.9	119.7
Somatic Complaints	40	50	90	59.3	8.6	74.6
Social Problems	33	50	83	59.7	7.9	61.9
Thought Problems	39	50	89	59.4	8.0	63.6
Attitude Problems	46	50	96	62.3	9.7	94.6
Rule Behaviours	41	50	91	66.4	9.1	81.6
Aggressive Behaviours	43	50	93	60.7	9.5	90.0
Anxiety Problems	23	50	73	56.3	6.3	40.0
ADHD	31	50	81	61.5	8.1	66.1
Oppositional Problems	31	50	81	60.4	8.2	66.5
Conduct Problems	42	50	92	64.7	9.7	93.9
Internalized Problems	51	30	81	57.9	10.6	112.9
Externalized Problems	57	34	91	62.8	11.4	130.5

Table 7 highlights the results of the clinical scores for the various risk factors. These

results indicate that 64% scored in the borderline or clinical range for Rule Behaviour, 53%

scored in the borderline or clinical range for Externalized Problems, 45% scored in the

borderline or clinical range for Conduct Problems, 37% of the girls scored in the borderline

or clinical range for Attitude Problems, 37% scored in the borderline or clinical range for

Oppositional Problems, 36% scored in the borderline or clinical range for ADHD, 34%

scored in the borderline or clinical range for Aggressive Behaviour, 30% scored in the

borderline or clinical range for Somatic Complaints, 29% scored in the borderline or clinical

range for Internalized Problems, 23% scored in the borderline or clinical range for Social

Problems, 17% scored in the borderline or clinical range for Thought Problems, and 9%

scored in the borderline or clinical range for Anxiety Problems.

Table 7

Frequencies and Clinical Ranges for Risk Factors (T-Scores) (N=100)

Risk Factor	T= 1-64 (non-clinical)	T= 65-69 (borderline clinical)	T= 70-100 (clinical)
Somatic Complaints	70	22	8
Social Problems	77	12	11
Thought Problems	83	8	9
Attitude Problems	63	20	17
Rule Behaviour	36	31	33
Aggressive Behaviour	66	15	19
Anxiety Problems	91	4	5
ADHD	64	19	17
Oppositional Problems	63	27	10
Conduct Problems	55	18	27
Internalized Problems	71	17	12
Externalized Problems	47	25	28

Relationships among Main Variables

   Correlations were used to determine the pairwise relationships among all three main variables (Depression, Substance Use, and Delinquency). The following correlations were conducted: 1) Total CDI score and prevalence of Substance Use score; 2) Total CDI score and prevalence of Delinquency score; and 3) Prevalence of Substance Use score and prevalence of Delinquency score.

   One outlier for the Delinquency variable was discovered. This subject's score of 15 was three standard deviations below the mean. Her data were eliminated from the correlations and regression analyses. Eliminating data from outliers that are more than two standard deviations from the mean is recommended by Steinberg (2008), as they can distort results.

   The correlation findings indicated that there is a significant, positive, relationship between Delinquency and Substance Use ($r = 0.781$, $p < 0.01$), a significant, positive, relationship between Depression and Delinquency ($r = 0.194$, $p < 0.05$), and no relationship between Depression and Substance Use ($r = 0.060$, $p = 0.56$). When partial correlations were conducted where the third variable was controlled for, the significance of the relationships did not change. The correlation matrix below outlines these results (Table 8).

Table 8

Pearson Correlations among Main Variables – Correlation Matrix (N=99)

	Total CDI	Substance Use	Delinquency
Total CDI (Depression)	1		
Substance Use	.060	1	
Delinquency	.194*	.781**	1

* Pearson Correlation is significant at the 0.05 level (1-tailed)

** Pearson Correlation is significant at the 0.01 level (1-tailed)

Figure 4

Scatterplot – Delinquency (Delinq) and Substance Use (Sub Abuse)
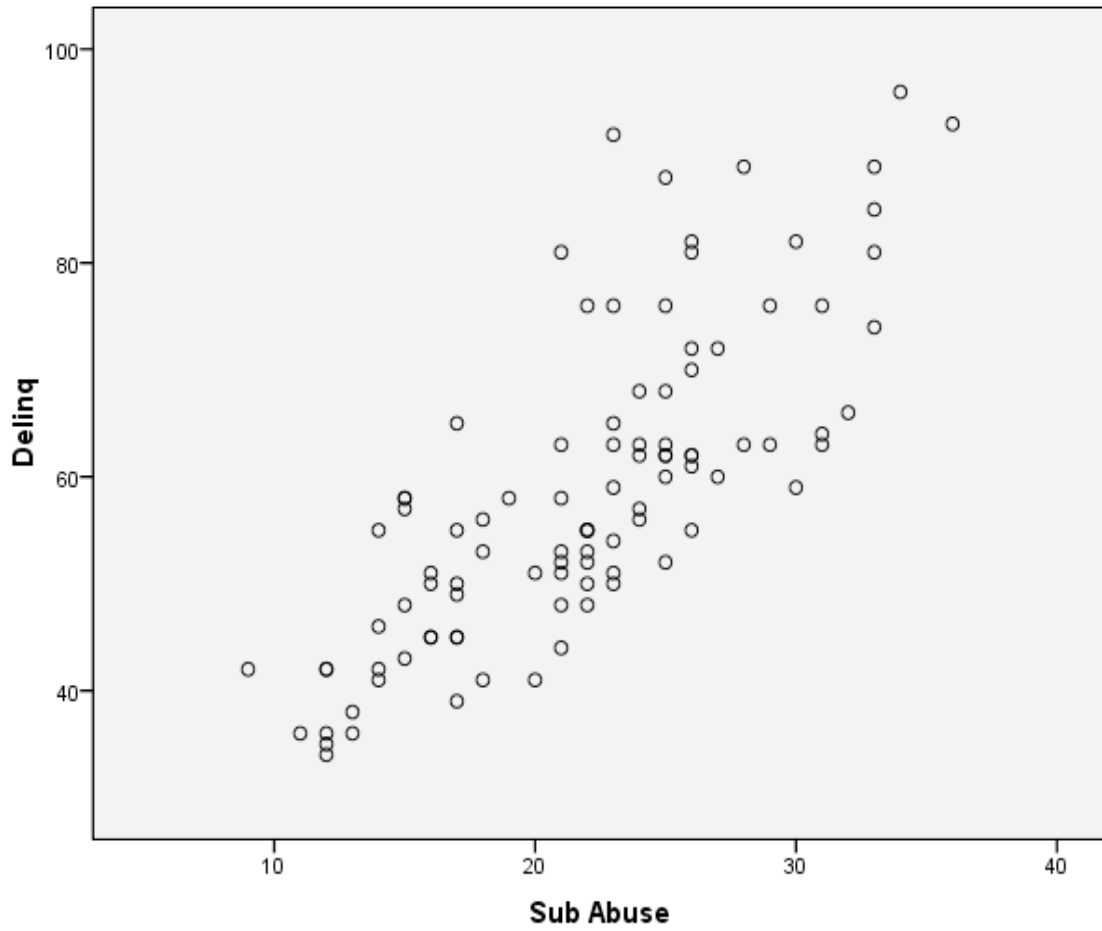
Figure 5

Scatterplot – Delinquency (Delinq) and Depression (Total CDI)
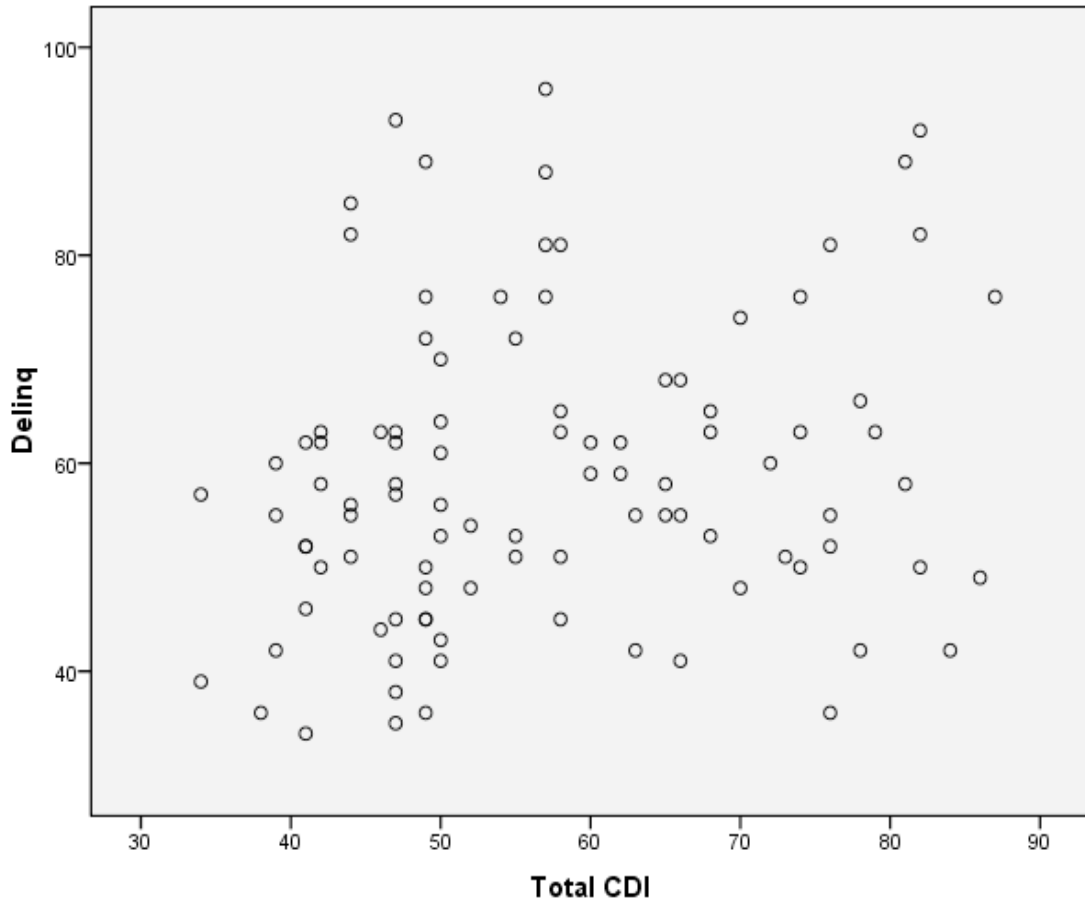
Figure 6

Scatterplot – Depression (Total CDI) and Substance Use (Sub Abuse)
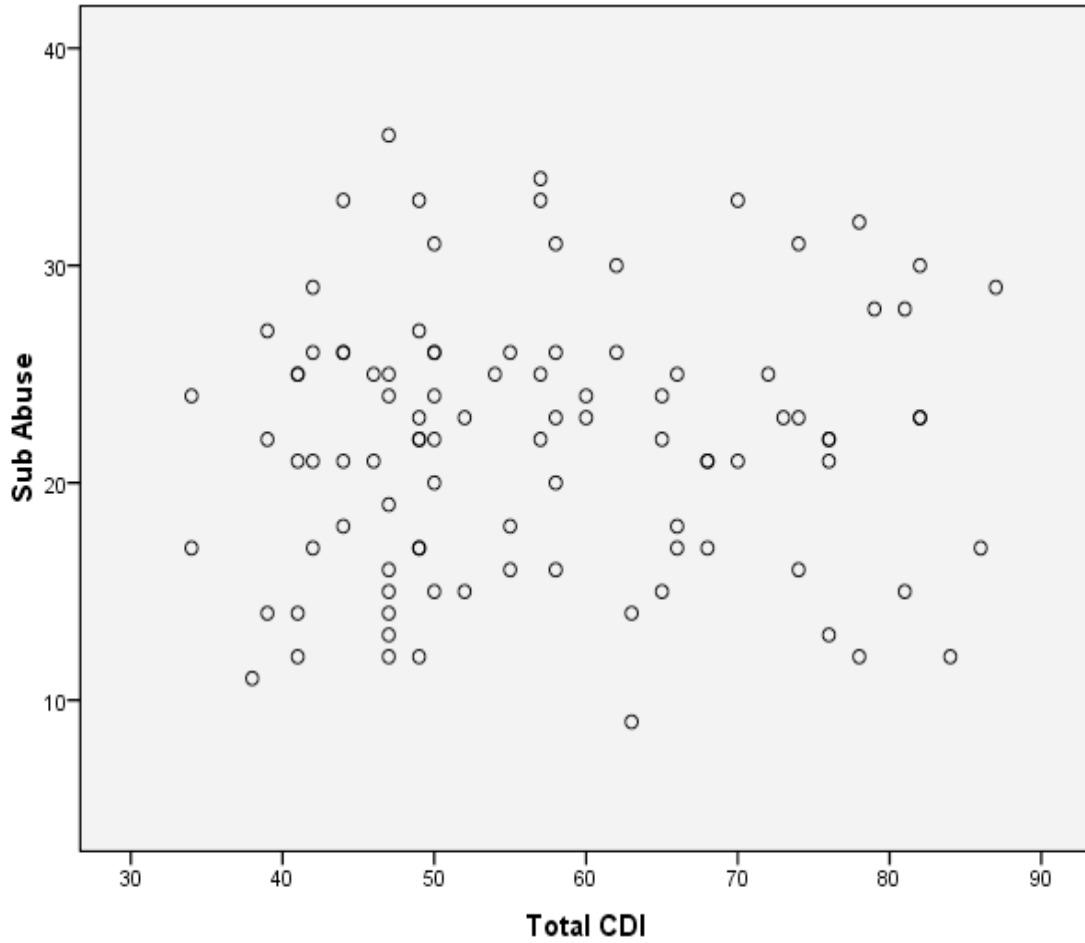
Relationships among Main Variables and Risk Factors

Correlations were used to determine the pairwise relationships between each of the three main variables (Depression, Substance use, and Delinquency) and each of the 12 risk factors (Self-Esteem, Social Problems, Somatic Complaints, Thought Problems, Attitude Problems, Anxiety Problems, Aggressive Behaviours, Rule Behaviours, ADHD, Oppositional Behaviours, Conduct Problems, and Externalized Problems). Table 9 outlines these scores.

Depression and Risk Factors

The results indicate that there was a significant, positive, relationship between Depression and each of the following variables: Self-Esteem (low score means high self-esteem), $r = .832$, $p < 0.01$), Social Problems ($r = .596$, $p < 0.01$), Attitude Problems ($r = .530$, $p < 0.01$), Thought Problems ($r = .443$, $p < 0.01$), Anxiety Problems ($r = .421$, $p < 0.01$), Rule Behaviours ($r = .415$, $p < 0.01$), Somatic Complaints ($r = .409$, $p < 0.01$), Conduct Problems ($r = .402$, $p < 0.01$), Externalized Problems ($r = .395$, $p < 0.01$), Aggressive Behaviours ($r = .335$, $p < 0.01$), ADHD ($r = .306$, $p < 0.01$), and Oppositional Behaviours ($r = .206$, $p < 0.05$).

Substance Use and Risk Factors

In terms of the relationship among Substance Use and the risk factor variables, the results indicate that there was a significant, positive, relationship between Substance Use and each of the following variables: Rule Behaviours ($r = .547$, $p < 0.01$), Externalized Problems ($r = .523$, $p < 0.01$), Conduct Problems ($r = .458$, $p < 0.01$), Aggressive Behaviours ($r = .420$, $p < 0.01$), Oppositional Behaviours ($r = .385$, $p < 0.01$), Thought Problems ($r = .217$, $p < 0.05$), ADHD ($r = .265$, $p < 0.05$), Somatic Complaints ($r = .205$, $p < 0.05$), and Attitude Problems ($r = .171$, $p < 0.05$). There was no relationship between

Substance Use and Social Problems (r = .056, NS), Anxiety Problems (r = .031, NS), or Self-Esteem (low score means high self-esteem, r = -.034, NS).

Delinquency and Risk Factors

      In terms of the relationship among Delinquency and the risk factor variables, the results indicate that there was a significant, positive, relationship between Delinquency and the following variables: Rule Behaviours (r = .634, p < 0.01), Externalized Problems (r = .613, p < 0.01), Conduct Problems (r = .603, p < 0.01), Aggressive Behaviours (r = .577, p < 0.01), Oppositional Behaviours (r = .532, p < 0.01), ADHD (r = .441, p < 0.05), Thought Problems (r = .332, p < 0.01), Attitude Problems (r = .300, p < 0.01), and Somatic Complaints (r = .185, p < 0.05). There was no relationship between Delinquency and the following variables: Self-Esteem (r = .130, NS), Social Problems (r = .158, NS), or Anxiety Problems (r = .043, NS).

Table 9

Pearson Correlations – Main Variables and Risk Factors (N=99)

	Depression	Substance Use	Delinquency
Self Esteem	.832**	-.034	.130
Somatic Complaints	.409**	.205*	.185*
Social Problems	.596**	.056	.158
Thought Problems	.443**	.217*	.332**
Attitude Problems	.530**	.171*	.300**
Rule Behaviour	.415**	.547**	.634**
Aggressive Behaviour	.335**	.420**	.577**
Anxiety Problems	.421**	.031	.043
ADHD	.306**	.265*	.441**
Oppositional Problems	.206*	.385**	.532**
Conduct Problems	.402**	.458**	.603**
Externalized Problems	.395*	.523*	.613**

* Pearson Correlation is significant at the 0.05 level (1-tailed)

** Pearson Correlation is significant at the 0.01 level (1-tailed)

Regression Analysis for the Main Variables

   The purpose of conducting the forward selection multiple linear regression analysis was to identify how much of the Delinquency variable could be accounted for by the set of predictors (Substance Use and Depression). Also, it was used to determine what predictor (Substance Use or Depression) can explain more variance in the Delinquency variable. In addition, it was used to determine if each of the predictors explains unique variance in the Delinquency variable.

   In this analysis, the forward selection began with no predictors in the regression equation. Then, the predictor variable that had the highest correlation with Delinquency was entered into the equation first. This variable was Substance Use. Then, Depression was entered into the equation last as it had the least amount of contribution to the variance in the Delinquency variable.

   The results of the forward selection multiple linear regression analysis are outlined in Tables 10 and 11. The R-Square score is a measure of how much of the variability in the outcome is accounted for by the predictors. For the first model, the value is .609. This means that Substance Use accounted for 60.9% of the variation in Delinquency. For the second model, this value increased to .631, or 63.1% of the variance in Delinquency. Therefore, when Depression was added, it accounted for an extra 2.2% of unique variance in Delinquency scores. The residuals were plotted in Figure 7 and provide a graphical version of the t-statistic for Delinquency and Substance Use after removing the linear effect of the other variables in the model.

   The Durbin-Watson statistic for independent errors yielded a score of 2.102. According to Field (2005), the Durbin-Watson test statistic "can vary between 0 and 4 with a value of 2 meaning the residuals are uncorrelated" (p. 730). This indicated that the independent errors in this analysis were found to be acceptable.

Table 10

Forward Selection Multiple Linear Regression (Delinquency is the DV) (N=99)

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate	Durbin-Watson
1	.781 [a]	.609	.605	9.174	
2	.794 [b]	.631	.623	8.962	2.102

a. Predictors: (Constant), Substance Use

b. Predictors: (Constant), Substance Use, Total CDI (Depression)

Table 11

Coefficients - Forward Selection Multiple Linear Regression (Delinquency is the DV)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	17.82	3.48		5.13	.000
	Substance Use	1.874	.153	.781	12.24	.000
2	(Constant)	9.36	4.93		1.90	.061
	Substance Use	1.85	.150	.772	12.36	.000
	Depression	.156	.066	.148	2.37	.020

Figure 7

Regression Analysis Scatterplot
DV is Delinquency; IV's are Depression and Substance Use

Scatterplot

Dependent Variable: Delinq

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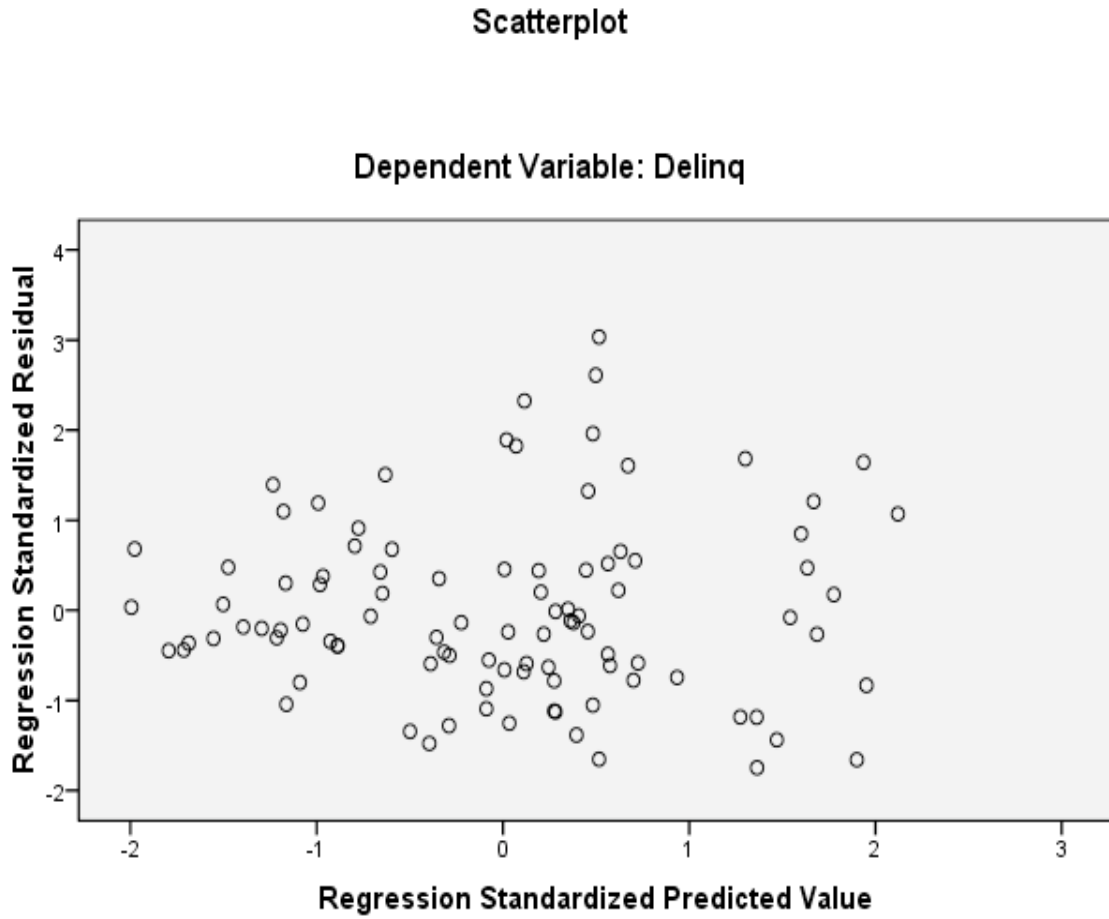
Regression Analysis for Substance Use and Risk Factors

The purpose of conducting the forward selection multiple linear regression analysis was to identify how much of the Substance Use variable could be accounted for by the set of predictors (various risk factors). Substance Use was chosen as the dependent variable because it was found to be the strongest predictor of Delinquency. Although Depression did have some input on the variance of the Delinquency variable, Substance Use had the strongest input. Also, this regression was used to determine which risk factor could explain more variance in the Substance Use variable.

In this analysis, the forward selection began with no predictors in the regression equation. Then, the predictor variable that had the highest correlation with Substance Use was entered into the equation first. This variable was Rule Behaviour. Then, the variables Self-Esteem and Somatic Complaints were entered into the equation. The other risk factors (Thought Problems, Aggressive Behaviour, Anxiety Problems, ADHD, and Externalized Problems) were excluded from the equation.

The results of the forward selection multiple linear regression analysis are outlined in Tables 12 and 13. The R-Square score is a measure of how much of the variability in the outcome is accounted for by the predictors. For the first model, the value is .300. This means that Rule Behaviour accounted for 30% of the variation in Substance Use. For the second model, this value increased to .374, or 37.4% of the variance in Substance Use. Therefore, when the Self-Esteem variable was added, it accounted for an additional 7.4% of unique variance in Substance Use scores. For the third model, the value increased to .414, or 41.4% of the variance in Substance Use. Therefore, when the variable Somatic Complaints was added, it accounted for an additional 4.0% of unique variance in Substance Use.

The residuals were plotted in Figure 8 and provide a graphical version of the t-statistic for Substance Use and Rule Behaviour after removing the linear effect of the other

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variables in the model. The Durbin-Watson statistic for independent errors yielded a score of

1.427. This indicated that the independent errors in this analysis were found to be

acceptable.

Table 12

Forward Selection Multiple Linear Regression (Substance Use is the DV) (N=99)

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate	Durbin-Watson
1	.547 [a]	.300	.292	5.115	
2	.611 [b]	.374	.361	4.862	
3	.643 [c]	.414	.395	4.730	1.427

a. Predictors: (Constant), Rule Behaviour

b. Predictors: (Constant), Rule Behaviour, Self-Esteem

c. Predictors: (Constant), Rule Behaviour, Self-Esteem, Somatic Complaints

Table 13

Coefficients - Forward Selection Multiple Linear Regression (Substance Use is the DV)

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.771	3.880		-.71	.477
	Rule Behaviour	.370	.058	.547	6.41	.000
2	(Constant)	.293	3.800		.08	.939
	Rule Behaviour	.449	.060	.664	7.52	.000
	Self-Esteem	-.163	.049	-.296	-3.36	.001
3	(Constant)	-6.356	4.541		-1.40	.165
	Rule Behaviour	.443	.058	.655	7.62	.000
	Self-Esteem	-.195	.049	-.355	-3.98	.000
	Somatic Comp.	.146	.058	.209	2.52	.013

Figure 8

Regression Analysis Scatterplot
DV is Substance Use; IV's are Risk Factors

Scatterplot

Dependent Variable: Sub Abuse
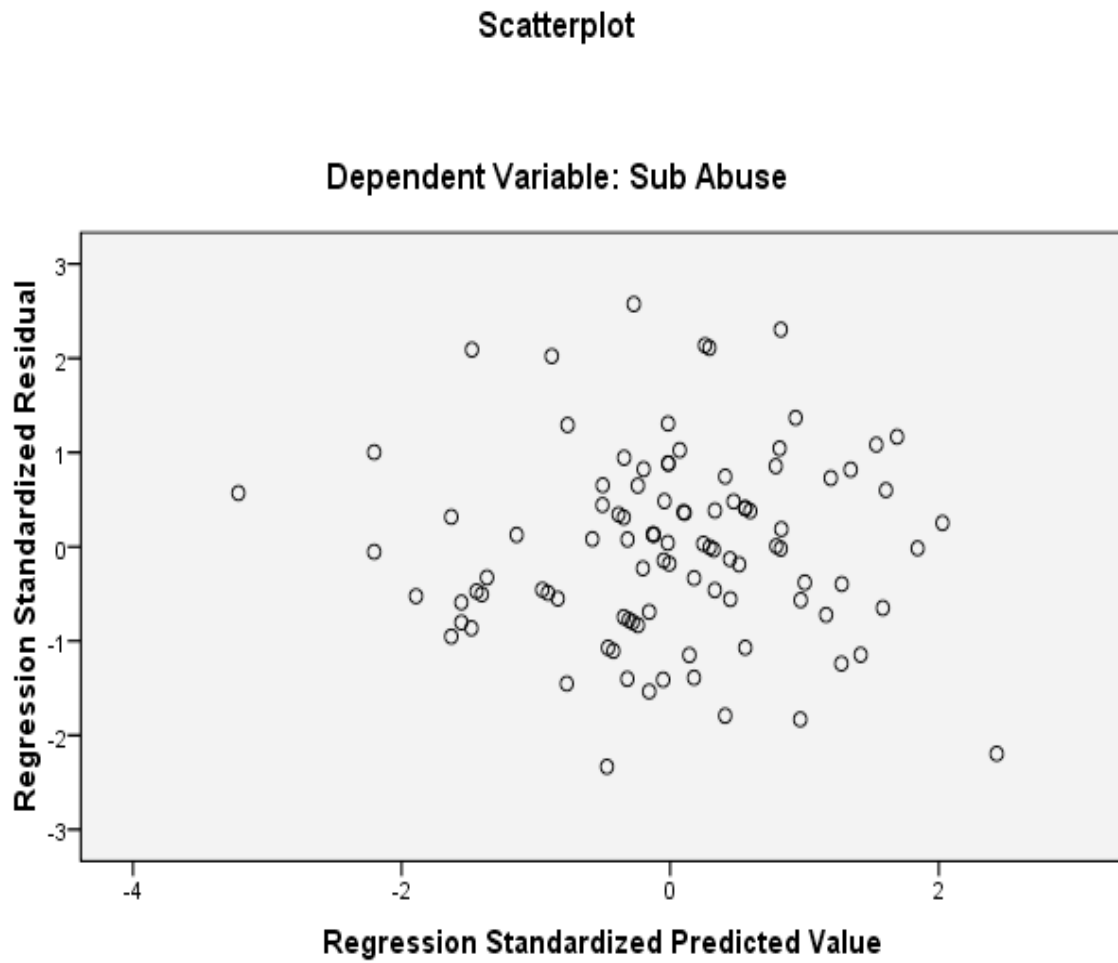
Discussion

This section will present a summary of the results and review the study's significant findings. In addition, possible explanations will be discussed in terms of the relevance and importance of the findings. Further, implications for clinical practice will be reviewed. Finally, limitations of the study will be discussed and suggestions for the direction of future research will be presented.

Results Summary

The results indicated the diversity in ages, cultures, sexual orientation, backgrounds, and living arrangements for adolescent girls from community-based street clinics and alternative schools. Substance use and delinquency had a strong, significant, positive relationship in this sample. Depression was found to play a significant but smaller role in the prevalence of delinquency. In addition, various risk factors were found to be related to substance abuse (as a predictor for delinquency), which included Rule Behavior, Self-Esteem, Somatic Complaints, and Externalized Problems.

Demographics and Main Variables

In the present study, the results of the descriptive statistics for depression, substance use, and delinquency, demonstrated that this data set is representative of similar findings of a similar population, as evidenced by previous research conducted by Chiles, Miller, and Cox (1980), American Bar Association & National Bar Association, as cited in Leve & Chamberlain (2004), Varley and McCauley (2000), and McGirr (2007). Of interest, the demographic statistics indicated that 44% of the girls were non-Caucasian, and 57% did not live in two-parent households (i.e., they lived with single-parents, step-parents, foster homes, or lived alone).

Research collected on adult sexual orientation from Statistics Canada (2004) indicates that only 0.7% of Canadian adults (aged 18 to 59) identified themselves as Bisexual and 1.0% identified themselves as Homosexual (Gay or Lesbian). There are no data that represents adolescent sexual orientation. Interestingly, 12% of the adolescent participants in this study identified themselves as Bisexual and 2% identified themselves as Homosexual (Lesbian). The aforementioned description of the sample indicates that it is very diverse in terms of demographic data (cultural background, living arrangement, and sexual orientation).

The mean scores for depression, substance use, and delinquency, indicate that these variables are very prevalent among adolescent girls from various alternative schools, youth clinics, and community agencies. Specifically, 31% of the girls scored in the clinical range for depression, 87% in the moderate or severe range for substance use, and 73% in the moderate or severe range for delinquency.

The means for depression (Total CDI) were higher than those outlined by Kovacs (1992) with a sample of male and female students from various U.S. school districts and as well as a clinical sample. In addition, the scores for substance use were higher than the general adolescent population. However, it has been found that substance use is more common among street youth. According to the Public Health Agency of Canada (2007), the prevalence of smoking, alcohol use and intoxication, drug use, and drug-use risk behaviours is much higher among street youth than in the general youth population. Further, the results indicated a higher prevalence of delinquency than the Canadian sample in Comes et al.'s (2003) research. This research found that 44.3% of the adolescents reported no involvement in delinquency, and 55.7% reported being involved in at least one delinquent act in the past year. This may be explained by the population sampled in this research who may be more at risk of engaging in delinquent behaviours.

In summary, for this sample of 100 adolescent girls from various youth clinics, alternative schools, and community agencies, all of their scores for the three main variables (Depression, Substance Use, and Delinquency) fell within the moderate range. These results indicated that this population of girls struggle more with these issues than those from the general population (Kovacs, 1992; Public Health Agency of Canada, 2007; Comes et al., 2003).

Significant Findings

When the three variables (Depression, Substance Use, and Delinquency) were analyzed amongst each other, it was found that substance use and delinquency had a strong, significant, positive relationship. This is consistent with Hypothesis1. Depression also had a significant positive relationship with delinquency but it was of a smaller magnitude. This is consistent with Hypothesis 2. Although Ritakallio et al. (2006) found that depression is closely connected to adolescent delinquency, the present study found that this relationship was much less significant. This may be the result of the sample being studied. Adolescent girls in juvenile delinquency centres may be more at risk for depression than those from community-based samples.

In addition, the results indicated that there was no relationship between Depression and Substance Use. Therefore, Hypothesis 3 was not supported. This finding is inconsistent with research conducted by Poulin et al. (2005) who found that substance abuse is related to elevated depressive symptoms in adolescence.

When a regression analysis was run for the three main variables, it was found that Substance Use accounted for 60.9% of the variation in Delinquency. When Depression was added to the equation, it accounted for an extra 2.2% of the unique variance in Delinquency scores. This further indicates that Substance Use plays a larger role in the prevalence of Delinquency than does Depression. Therefore, this supports part of Hypothesis 4, where

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substance abuse and delinquency as well as depression and delinquency have significant, positive, relationships. However, substance use and depression are not significantly related. Therefore, the Null Hypothesis is not rejected.

In terms of risk factors, it was found that there were significant, positive, relationships among various risk factors for groups of adolescent girls who have been involved in delinquent behaviours, are depressed, and use substances. This is consistent with Hypothesis 5. The results indicated that there was a significant positive relationship between depression, substance use, delinquent behaviours, and somatic complaints (i.e., headaches and stomach aches). This was particularly true with girls who scored higher on depression. Therefore, girls with depression are more likely to have concurrent somatic symptoms than girls who are not depressed.

In addition, adolescent girls who scored high on depression, delinquency, and substance abuse (i.e., have more clinical symptoms) reported that they have problems organizing their thoughts, following rules, paying attention, and often externalize their emotions. Further, they are more likely to engage in impulsive acts, display aggression, and disobey authority figures. Many girls who scored high on the main variables also scored high on ADHD. Therefore, girls who have difficulties with depression, delinquency, and substance use, are more likely to also have externalized problems compared to those who don't have problems in these areas.

Specifically, when regression analyses were conducted for Substance Use and the various risk factors (as a predictor of Delinquency), it was found that Rule Behaviour accounted for 30% of the variation in Substance Use. When the Self-Esteem variable was added to the equation, it accounted for an additional 7.4% of the unique variance in Substance Use scores. In addition, when the Somatic Complaints variable was added, it accounted for an additional 4.0% of unique variance in Substance Use.

In summary, the results of this study indicate that substance use is strongly related to delinquent behaviour in adolescent girls. Adolescent girls who use substances (drugs and alcohol) are more likely to engage in delinquent behaviours than girls who do not use substances. Depression also plays a role; however, it is much smaller. In addition, some identified risk factors, namely, not obeying the rules, low self-esteem, externalized problems (i.e., oppositional and conduct behaviours), and somatic complaints are strongly related to substance abuse in adolescent girls. Therefore, these identified risk factors are strongly predictive of substance abuse and delinquency.

Explanations, Relevance, and Importance of the Study

This study contributes to the knowledge about delinquency and substance use in depressed adolescent girls. There are various possible explanations for the study's findings. First, girls who are heavily involved in drug and alcohol use may need to engage in delinquent behavior in order to pay for their ongoing substance use. For example, adolescents may shoplift, sell drugs, or steal from their parents, in order to buy drugs or alcohol.

Second, adolescent girls who have trouble following the rules may also have difficulty obeying the law, thus engaging in delinquent behavior. Adolescent girls who are oppositional, skip school, disobey authority figures, and cheat on tests, are more likely to disobey further and break the law. Third, girls who externalize their problems may use substances more frequently as a maladaptive coping strategy. Instead of internalizing their problems (i.e., where they withdraw from others or experience anxiety), they act out in externalized ways, i.e., where they use substances or break the law.

Fourth, it has been found that the prevalence of mental health problems and disorders are high among adjudicated female adolescents (Corneau & Lanctot, 2004). This would explain the significant relationship between depression and delinquency. Finally, it

was found that the adolescent girls in this sample have significant difficulties with following rules and externalizing their problems. A possible explanation for these results is that girls who abuse substances may be more likely to engage in other maladaptive coping strategies (i.e., rule-breaking or conduct behaviours) than those who do not abuse substances. In addition, because they also struggle with low self-esteem, they may use substances in their peer group in order to be accepted and feel better about themselves. Further, adolescent girls who have somatic problems may use substances in order to alleviate their physical symptoms.

The results of this study indicated that there was no relationship between Depression and Substance Use. A possible explanation for this result is that girls who are depressed may not have the energy or motivation to seek out substances. Or, depressed girls may be taking anti-depressant medications and their prescribing doctor may have advised them that they cannot use substances, i.e. alcohol, at the same time for risk of contraindications.

Although this sample is community-based, it has similar results to Corneau & Lanctot's (2004) sample of juvenile offenders in that many of the girls in the present study who scored high on substance use and delinquency were also found to have symptoms of various mental disorders, i.e., Depression, ADHD, ODD, and Conduct Disorder. Therefore, adolescent girls from community-based and juvenile delinquent experience similar mental health issues.

In addition, this research has identified various risk factors among adolescent girls who struggle with depression, use substances, and engage in delinquent behaviours. This is consistent with the research conducted by Beitchman et al. (2005) who found that adolescents who are depressed and abuse substances have a greater number of early risk factors. Specifically, this study has identified risk factors that are strongly related to substance use, which, in turn, are related to delinquency in adolescent girls. These data can

lead to the formulation of recommendations, interventions, treatment, and prevention strategies when working with adolescent girls who have problems in these areas.

Clinical Implications

In terms of application to clinical practice, it would be important for clinicians who work with this population to be aware of how delinquency, substance use, and depression are inter-connected and related to each other. Girls who utilize community-based clinics and alternative schools are considered to be at-risk for other behavioural difficulties and to represent a potentially important group for prevention efforts. The results of this study highlight the prevalence of substance abuse and co-occurring problems (i.e., ADHD, ODD, Conduct Disorder, and low self-esteem) in the sub-group of girls at-risk for delinquency. Further, this group of girls reported more externalized means of coping. These results support the inclusion of evidence-based drug and alcohol programs for at-risk adolescent girls that focus on problem-solving, life skills, and positive coping strategies for emotional regulation (Winters, Fahnhorst & Botzet, as cited in Mash & Barkley, 2007). Additionally, many of these girls reported somatic problems which warrant symptom monitoring and follow-up with a medical practitioner to rule out possible co-occurring medical conditions.

Limitations of the Study

First, validity of adolescent responses is a limitation because it is uncertain as to their truthfulness when reporting sensitive issues. This is especially true around the reporting of delinquency and drug and alcohol use. Second, this study relies on all self-report data without other indices, such as collateral information from parents or teachers. This causes a potential bias in the adolescent responses. Third, this study's results are only generalizable to the population sampled, i.e., adolescent girls from various Canadian

communities.

Directions for Future Research

There are numerous various potential research opportunities in this area of study. A significant number of adolescent girls utilize community-based clinics and alternative schools. Additionally, the number of girls with reported delinquency is increasing. This sample represents an important group for future research aimed at guiding prevention and early treatment. Future research could study the demographic data, i.e., culture/ethnicity, sexual orientation, and living arrangement, and their specific relationship to the main variables or risk factors.

Another possible area of research is to study the various protective factors from the Adolescent Self-Report Questionnaire, i.e., what stops them from engaging in delinquent or substance use behaviours. Protective factors could be compared against those who scored below 65 on the CDI, below 65 on the YSR, and had low scores on substance use and delinquency. Therefore, future research could focus on the qualitative protective factors and how those relate to depression, substance use, and delinquency in at-risk girls. An area of applied research would be to use the information reported by the girls themselves on delinquency, substance abuse, and co-occurring problems to augment an existing evidence-based substance abuse program for this group and empirically study pre- and post-intervention measures.

In addition, research could be conducted on the possible sensitive issues that clinicians need to consider when working with this population. Further, this sample population of adolescent girls could be compared to those from a different sample (i.e. public high school students) to determine the similarities and differences in terms of the relationship among depression, substance use, and delinquency, as well as the prevalence of risk factors and other mental health issues, i.e. ADHD. Or, this sample could be

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compared to adolescent boys from similar backgrounds to determine gender differences

among this population.

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APPENDIX A

Adaptation of the Self-Reported Delinquency and Drug-Use Items as Employed in the

National Youth Survey (Elliott & Ageton, 1980)

Self-Report Survey

This survey is about the behaviours of adolescent girls. In order for this study to be of value, you must answer the questions honestly. Your answers will be kept confidential, and no one outside the research staff will ever see them.

1. Which one of these groups best describes you?
   _____ (1) Caucasian   _____ (4) Native/Aboriginal
   _____ (2) African American   _____ (5) Asian
   _____ (3) Latino   _____ (6) Other: _____

2. What is your age? _____

3. What is the last grade completed in school? _____

4. Are you currently in foster care?
   Yes _____   No _____

5. Have you been a member of any athletic team at school?
   Yes _____   No_____

   (If Yes): Which team(s)? _____

6. Have you taken part in any school activities, for example, service clubs, recreational or hobby clubs, student government, newspaper or yearbook? (Not athletic clubs or honour societies)
   Yes _____   No_____

   (If Yes): Which activities? _____

7. Have you been a member of any groups in the community such as service clubs, religious groups, recreational or hobby clubs, and athletic teams? (Includes scouts, little league, YMCA, etc.)
   Yes _____   No_____

   (If Yes): Which community groups? _____

8. Have you had a job or jobs, such as working at a store, office, or service station, or babysitting for pay? (Include any job for pay, but not "allowance")
   Yes _____   No_____

For the next set of questions, please tell me how often you have been involved in the following behaviours, and circle **1. Never, 2. Once or Twice, 3. Several Times, or 4. Often:**

9. Run away from home?
   1. Never   2. Once or Twice   3. Several Times   4. Often

10. Cheat on school tests?
    1. Never   2. Once or Twice   3. Several Times   4. Often

11. Participated when another student asked you to help him or her cheat on an exam?
    1. Never   2. Once or Twice   3. Several Times   4. Often

12. Skipped classes without an excuse?
    1. Never   2. Once or Twice   3. Several Times   4. Often

13. Been suspended from school?
    1. Never   2. Once or Twice   3. Several Times   4. Often

14. Purposely damage or destroy property that does not belong to you?
    1. Never   2. Once or Twice   3. Several Times   4. Often

15. Steal something less than $5?
    1. Never   2. Once or Twice   3. Several Times   4. Often

16. Steal something worth more than $50?
    1. Never   2. Once or Twice   3. Several Times   4. Often

17. Stolen money from your parents?
    1. Never   2. Once or Twice   3. Several Times   4. Often

18. Found something like a wallet or jewellery and did not return it to the police or the owner?
    1. Never   2. Once or Twice   3. Several Times   4. Often

19. Stolen or tried to steal something at school, such as someone's coat from a locker or a book from the library?
    1. Never   2. Once or Twice   3. Several Times   4. Often

20. Hit or threatened to hit an adult at school?
    1. Never   2. Once or Twice   3. Several Times   4. Often

21. Used force to get money or things from other students?
    1. Never   2. Once or Twice   3. Several Times   4. Often

22. Hit or threatened to hit one of your parents?
    1. Never   2. Once or Twice   3. Several Times   4. Often

23. Hit or threaten to hit someone without any reason?
    1. Never   2. Once or Twice   3. Several Times   4. Often

24. Been involved in fights?
    1. Never   2. Once or Twice   3. Several Times   4. Often

25. Been loud, rowdy, or unruly in a public place – disorderly conduct?
    1. Never   2. Once or Twice   3. Several Times   4. Often

26. Break into a vehicle or a building to steal something?
    1. Never   2. Once or Twice   3. Several Times   4. Often

27. Purposely damaged property belonging to a family member?
    1. Never   2. Once or Twice   3. Several Times   4. Often

28. Thrown objects such as rocks, snowballs, or bottles at cars or people?
    1. Never   2. Once or Twice   3. Several Times   4. Often

29. Made obscene phone calls, such as calling someone and saying dirty things?
    1. Never   2. Once or Twice   3. Several Times   4. Often

30. Use Marijuana?
    1. Never   2. Once or Twice   3. Several Times   4. Often

31. Use alcohol?
    1. Never   2. Once or Twice   3. Several Times   4. Often

32. Lied about your age to gain entrance or to purchase something? For example, lying
    about age to buy liquor or get into a movie.
    1. Never   2. Once or Twice   3. Several Times   4. Often

33. Bought or provided alcohol to a minor?
    1. Never   2. Once or Twice   3. Several Times   4. Often

34. Used prescription drugs, such as amphetamines, when there was no medical need
    for them?
    1. Never   2. Once or Twice   3. Several Times   4. Often

35. Been drunk in a public place?
    1. Never   2. Once or Twice   3. Several Times   4. Often

36. Sold hard drugs, such as heroin or cocaine?
    1. Never   2. Once or Twice   3. Several Times   4. Often

37. Use Ecstasy?
    1. Never   2. Once or Twice   3. Several Times   4. Often

38. Use tobacco?
    1. Never   2. Once or Twice   3. Several Times   4. Often

39. Gotten drunk?
    1. Never   2. Once or Twice   3. Several Times   4. Often

40. Use Crystal Meth?
    1. Never   2. Once or Twice   3. Several Times   4. Often

41. Expelled or kicked out of school?
    1. Never   2. Once or Twice   3. Several Times   4. Often

42. Involved in graffiti or "tagging" public or private property?
    1. Never   2. Once or Twice   3. Several Times   4. Often

43. Involved in gang activity?
    1. Never   2. Once or Twice   3. Several Times   4. Often

44. Own, carry, or use weapons (i.e., pepper spray, knives, pellet guns, etc.)?
    1. Never   2. Once or Twice   3. Several Times   4. Often

45. Arrested by the police?
    1. Never   2. Once or Twice   3. Several Times   4. Often

46. Involved in Fraud (i.e., using fake identification)?
    1. Never   2. Once or Twice   3. Several Times   4. Often

47. Involved in prostitution?
    1. Never   2. Once or Twice   3. Several Times   4. Often

48. Breaking and entering (i.e., for the purpose of stealing others' property)?
    1. Never   2. Once or Twice   3. Several Times   4. Often

49. Set fires?
    1. Never   2. Once or Twice   3. Several Times   4. Often

50. Shoplifted?
    1. Never   2. Once or Twice   3. Several Times   4. Often

APPENDIX B

Adolescent Self-Report Questionnaire

Adolescent Questionnaire

Check one box:

Composition of Your Family: Two-parent house   □
                               Single-parent house □
                               Mixed Family (i.e., step-parents) □
                               Other: _____

Sexual Orientation: Heterosexual □
                               Homosexual   □
                               Bisexual   □
                               Other: _____

Answer the following questions:

1. What do you like most about your life right now?

2. What are the hardest things in your life right now?

3. If you could give advice to someone your age, based on your experience, what would it be?

4. What stops you from engaging in delinquent behaviour?

5. What stops you from using drugs or alcohol?

6. What/who helps you get through hard situations?

APPENDIX C

Consent Form for Research

Consent Form for Research

You have been asked to take part in a research project described below. The researcher will explain the project to you in detail. You should feel free to ask questions. If you have more questions later, Susan Hunt, the person mainly responsible for this study, (susan_hunt@antiochsea.edu), will discuss them with you. You must be between the ages of 11 and 18 years to participate in this research project.

Description of the project:
You have been asked to take part in the study that will determine how groups of depressed and non-depressed adolescent girls who use/don't use substances differ in terms of engaging in delinquent behaviours.

What will be done:
If you decide to take part in this study here is what will happen: You will participate in several surveys and questionnaires. The data will be collected and analyzed to test hypotheses.

Potential risks or discomfort:
There are no foreseeable risks or discomforts, but questions from the instruments might raise uncomfortable feelings. It is important to note that you may withdraw from this study at any time.

Benefits of this study:
Although there will be no direct benefit to you for taking part in this study, you may contribute to the knowledge about delinquency and substance abuse in depressed and non-depressed adolescent girls. Also, it will help in the identification of risk and protective factors among adolescent girls. This may lead to the formulation of recommendations, interventions, treatment and prevention strategies when working with adolescent girls with depression and substance abuse.

Confidentiality:
Your participation in this study is confidential. This means that any information that you disclose will not be shared with anyone. However, there are limits to confidentiality that include: imminent risk of harming yourself or another (i.e., suicide), written authorization from you, child abuse or neglect, and court order or subpoena. If, during the study, you report that you are suicidal or are being abused, appropriate steps will be taken to ensure your safety. There will be a counsellor available to you if issues arise during the research. None of the information will identify you by name. All records will be kept in a locked file cabinet.

Decision to quit at any time:
The decision to take part in this study is up to you. You do not have to participate. If you decide to take part in the study, you may quit at any time. Whatever you decide will in no way penalize you. If you wish to quit, you simply inform Susan Hunt (susan_hunt@antiochsea.edu) of your decision.

Rights and Complaints:
If you are not satisfied with the way this study is performed, you may discuss your complaints with Susan Hunt, anonymously, if you choose.

You have read the Consent Form. Your questions have been answered. Your signature on this form means that you understand the information and you agree to participate in this study.

_____   _____
Signature of Participant   Signature of Researcher

_____   _____
Typed/printed Name   Typed/printed name

_____   _____
Date   Date

Please sign both consent forms, keeping one for yourself.