

LIDLAW SCHOLARS PROGRAM 2021 PROJECT:

An Examination of Substance Use and its Relationship to Criminogenic Needs in the Context of Canada's Youth Justice System

Introduction

The high rates of substance abuse among young offenders raise important concerns for public policy and practice given that drug/alcohol use is a significant risk factor for youth offending. Risk-need-responsivity (RNR) is a correctional model designed to inform interventions based on an individual's likelihood to reoffend and their risk factors (termed criminogenic needs) identified by the risk/need assessment. In the case of young offenders with substance use concerns, understanding this special concern and its relationship to other criminogenic needs may facilitate treatment insights into addressing the root causes of criminal conduct in youth with substance use disorder. The aim of this present study was to first elucidate the association between substance use problems, mental health needs, criminogenic needs in a sample of young offenders. The second goal of the study was to examine the extent to which needs are addressed by youth mental court workers while youth are on probation in the context of Canada's youth justice system.

Risk Assessment among Young Offenders

One of the most widely adopted models for the assessment and treatment of juvenile offenders in North America and beyond is the Risk-Need-Responsivity (RNR) model (Peterson-Badali, Skilling, & Haqanee, 2015). Based on meta-analytic studies conducted in criminal justice settings (e.g., Andrews et al., 1990; Andrews & Dowden, 2006; Dowden & Andrews, 2004), interventions designed in accordance to the RNR principle of risk, need, and responsivity significantly reduced future reoffending (Luong & Worthmuth, 2011). These principles suggest that programming should be more intensive for higher risk offenders (*risk* principle) to target criminogenic needs directly associated with offending (*need* principle) while factoring in individual's specific characteristics (i.e., learning style, motivation, or cognitive ability) that may influence treatment effectiveness (*responsivity* principle). To assess risk for reoffending and identify dynamic criminogenic needs, risk assessment tools have been developed based on the principles of the RNR model to inform case management during a youth's sentence (Clarke, Peterson-Badali, & Skilling, 2017).

One of the most used risk assessment tools is the Youth Level of Service/Case Management Inventory (YLS/CMI; Hoge & Andrews, 2002). The YLS/CMI is designed around eight risk factors identified as the strongest predictors of criminal activity, including the "big four" (criminal history, antisocial attitudes, antisocial peers, antisocial personality) and the "modest four" (family/marital, education /employment, leisure/recreation, substance abuse; Andrews & Bonta, 2010a; Andrews et al., 2012). Similar to other risk assessment tools, the use

of the YLS/CMI is based on the premise that the seven dynamic risk factors (excluding criminal history) are amenable to change and therefore should be identified and targeted during treatment to reduce risk for reoffend (Clarke, Peterson-Badali & Skilling, 2017). Studies on the YLS/CMI provide evidence for the validity of the Central Eight in predicting recidivism (Olver, Stockdale, & Wong, 2012; Olver, Stockdale, & Wormith, 2009; Schawalbe, 2008). Guebert & Olver (2014) suggest studying risk factors in different young offender populations, such as those with special mental health and substance use concerns, may further advance research.

Substance Use and Mental Health Dual Diagnosis

The widespread of mental health problems among justice-involved youth is of significant concern to justice system policy and practice. Most studies reported the rates of having any mental disorder amongst young offenders range from 67.2% to 70.4% (Shufelt & Cocozza, 2006; Teplin et al., 2002; Wasserman et al., 2005; Wasserman et al., 2002). Regardless, levels of mental health issues among this population have been notably higher compared to the general population (Kenny et al., 2007), a particularly concerning comorbid substance use disorder (SUD).

Although classified as a mental disorder in the *Diagnostic and Statistical Manual* (DSM-5, American Psychiatric Association, 2013), in the RNR framework SUD is a criminogenic need and thus it is considered separately from other disorders in the sphere of the justice system (Guebert & Olver, 2014). Although estimates tend to vary depending on the study's sample and methodology (Guebert and Olver, 2014), the number of young offenders meeting the criteria for any SUD was estimated to be 20% to as high as 51% of the total population (Sales et al., 2018). Among substance abusers, the rates of "dual diagnosis" (the co-occurrence of SUD and an additional mental disorder; Ogloff, Lemphers, & Dwyer, 2004) amongst justice-involved youth is reported to range from 21-30% (males and females, respectively; Abram et al., 2003) to 61% (Shufelt & Cocozza, 2006).

Compared to non-SUD youth, SUD youth have increased mood and behavior problems, including conduct disorder (Brown et al., 1996; Kopolov et al., 2005), mood and anxiety disorders (Grant et al., 2004), post-traumatic stress disorder (Kopolov et al., 2005), and suicidality (Hufford., 2001). The high prevalence of dual diagnoses raise the question about the relationship between SUD, mental health, and other criminogenic needs in youth criminal activity.

Substance Use, Dual Diagnosis, and Criminal Behavior

A meta-analysis of forty-five studies on substance abuse in predicting reoffending (Dowden & Brown, 2002) confirms findings from past meta-analytic studies (Bonta et al., 1998; Gendreau et al., 1996) that substance use problems were only mildly related to general recidivism (weighted mean effect size or $Mz+ = .10$) compared to other dynamic criminogenic

needs such as antisocial personality ($Mz+ = .18$) or antisocial peers ($Mz+ = .21$). When substance abuse was further broken down into five distinct predictor categories, Dowden & Brown (2002) found that a combined alcohol and/or drug problem category had the highest effect size ($Mz+ = .22$), followed by drug abuse ($Mz+ = .19$), parental substance abuse ($Mz+ = .13$), and alcohol abuse ($Mz+ = .12$) in general offender population. Among mentally disordered offenders, Bonta et al. (1998) reported drug abuse ($Mz+ = .09$) had a slightly stronger relationship to recidivism compared to alcohol abuse ($Mz+ = .06$). Regardless, these studies support previous findings of the weak association between substance use and criminal offending. Yet given the high prevalence rates of SUD among young offenders, it is rather counterintuitive that drug/alcohol use is only a “modest” predictor of criminal activity.

Brown et al. (2019) suggested that to understand how substance use problems are related to recidivism, it is important to assess the specific roles that substance use plays in each individual's offence. For some youth, substance use is *criminogenic*, meaning it is directly related to an individual's offending (i.e., when a youth commits crimes while intoxicated or to support their drug use; Brown et al., 2019). For others, substance use is problematic in other aspects of youth's lives (e.g., interfering with education, employment, or personal relationships) but is not directly related to their offending, or *non-criminogenic* (Brown et al., 2019). An examination of criminogenic needs in juvenile settings found significant relationships between substance abuse with heightened problems in most YLS/CMI measures, including education/employment, antisocial peers, leisure/recreation, criminal history, and overall risk (Guebert & Olver, 2014). The finding indicated that youth with SUD were at increased risk compared to their non-substance use peers and thus likely benefit from more intensive programming to target both SUD and related criminogenic needs given the relationship with other YLS/CMI domains. This relationship poses important considerations for effective treatment planning, delivery, and engagement to reduce recidivism in substance-abuse offenders.

Furthermore, Guebert and Olver (2014) also emphasized the importance of addressing mental health problems to help maximize treatment responsiveness. It is important to note that mental health problems are not generally considered a risk factor for recidivism according to the RNR model; studies conducted in juvenile settings (McCormick, Peterson-Badali, & Skilling, 2017; Guebert & Olver, 2014) indicated that youth with mental health needs were no more likely than youth with no mental health needs to reoffend. Although mental health treatment alone is ineffective in reducing recidivism (Andrews & Bonta, 2010a), treatment of mental disorders as a *responsivity* factor coupled with criminogenic needs treatment has been associated with decreased reoffending (McCormick, Peterson-Badali, & Skilling, 2017). Thus, service for youth offenders with mental health diagnoses may benefit from adapting services to each individual's specific need, thereby improving youth engagement and outcomes for criminogenic needs treatment (Guebert & Olver, 2014).

Treatment-Need-Match and Recidivism Outcomes

Service-to-need match examines whether individual offenders' receipt of services align with their specific criminogenic needs as identified by the YLS/CMI (Nelson & Vincent, 2018). This strategy reflects the implementation of the RNR need principle, which focuses on targeting dynamic criminogenic needs as an effective strategy to reduce odds of reoffending. Studies conducted in youth justice settings provide evidence to support the association between treatment-need-match and recidivism (Luong & Wormith, 2011; Peterson-Badali, Skilling, & Haqanee, 2015; Vieira, Skilling & Peterson-Badali, 2009). In Vieira et al.'s (2009) study, for example, youth's receipt of matched services reoffend at a 50%-lower-rate than youth's receipt of services unmatched to their identified YLS/CMI needs (25% versus 75%). In addition to frequency of recidivism, service-to-need match has a strong association to time to reoffense; Vieira et al. (2009) reported youth in low needs match groups were at 76.2% risk for early recidivism versus 42.5% and 27.3% from the moderate and high match groups, respectively, in the 1,700 days (4.7 years) time period.

Although many studies support the efficacy of programming adhering to the RNR principles, the quality of treatment-need-match implementation has been limited. Luong & Wormith (2011) reported that youth were more likely to be over-referred or under-referred in some need areas by service providers rather than receiving a matched service for their identified needs: for example, the education/employment domain was classified as a need in only 13% of the sample, yet 81% of them received educational intervention. Likewise, Peterson-Badali et al (2015) revealed that youth had only 1.4 out of an average of 5 needs addressed by an appropriate service during probation. Possible barriers to effective treatment-need-match included the gaps in risk assessments implementation (Vincent et al., 2016), lack of service availability, the need to prioritize high-impact needs, and ambivalence in the role of probation officers (Haqanee, Peterson-Badali, & Skilling, 2015). Regardless, all studies highlight the need for better implementation of the need principle in programming for justice-involved youth.

The Present Study

Research on the relationship between substance abuse, mental health issues, and criminogenic needs has been an underexplored area in the field of youth criminal justice. The present study aimed to replicate and extend upon Guebert and Olver (2014) research on a sample of general youth offenders in Canada. Our research questions were as follows:

1. What are the relationships between substance abuse, mental health issues, and criminogenic needs in a Canadian forensic population?
2. To what extent do criminogenic needs get addressed while youth are on probation in a Canadian forensic population?
3. Is there an association between treatment needs matched and recidivism rates?

Based on previous studies, we hypothesized that SUD youth would be more likely to score higher in YLS/CMI domains for education/employment, peer relations, leisure/recreation

and prior offenses compared to non-SUD youth, but at a lower rate compared to a sample of violent young offenders. In addition, we anticipated that substance abusing youth may receive more service referrals due to elevated risk; however, the numbers of treatment-need-match while youth are on probation were not anticipated to be significantly different from non-substance abusing youth. Lastly, it was hypothesized that treatment needs matched would decrease the frequency and/or the intensity of subsequent offending.

Method

The present study employed an archival method to extract and analyse specific measures from the assessment files of a Canadian forensic population at a mental health agency in Ontario, Canada (Vieira et al., 2009).

Participants

The study sample consisted of 462 youth (male, $n=398$, female, $n=64$) between the age of 12 to 20 years ($M = 16.32$; $SD = 1.42$) who were referred to the mental health agency for assessment under a court-order by a youth court judge. The sample was ethnically diverse; 29.9% were identified as Whites, 33.1% Black, 2.8% Aboriginal, and 24% from other ethnicities (10% of the sample's race was missing). Data regarding youth's criminal charges show that violent, non-sexual offenses (i.e., murder, assault) accounted for 58.2% of the referrals, following by non-violent, non-sexual offenses (i.e., theft, drug-related offenses; 27.7%) and sexual offenses (12.6%). All participants had received assessments between 2001 and 2014 by a team of trained clinicians (i.e., psychiatrists, psychologists, and social workers) specialized in child and youth mental health.

Measures

Massachusetts Youth Screening Instrument Version 2 (MAYSI-2)

Massachusetts Youth Screening Instrument Version 2 (MAYSI-2; Grisso & Barnum, 2000) is a 112-item self-report measure designed to screen for emotional and behavioral problems in adolescents between the age of 12 to 18 in the past six months (Brown et al., 2021; Nho., 1999). The YSR measures eight empirically derived syndromes and DSM-orientated scales: withdrawn, somatic complaints, anxiety and depression, social problems, thought problems, attention problems, aggressive behavior, and delinquent behaviors (Achenbach, 1991). The first three subscales and the next two subscales belong to the "internalizing" and "externalizing" broadband, respectively, whereas the last three scales belong to neither (Nho., 1999). For each item, youth select their response on a 3-point Likert-type scale (0 = *Not true*, 1 = *Somewhat true*, 2 = *Very true* or *often true*) and the total problem scale is used to determine the overall emotional and behavioral functioning (Nho., 1999). The YSR scale demonstrates satisfactory internal consistency, test-retest reliability, concurrent and construct validity for its psychometric properties (Kakaberaie, Mojtaba, & Fedaei, 2008).

The Youth Level of Service/Case Management Inventory (YLS/CMI)

The YLS/CMI (Hoge & Andrews, 2003) is a standardized risk/need assessment tool developed to assess youth's criminogenic needs and their risk to reoffend. The measure consists of two sections. The first section of the YLS/CMI is a 42-item dichotomous checklist (0 = *absent* and 1 = *present*) that provides information about youth's needs on the eight criminogenic domains: criminal history, family problems, education/employment, peer relations, substance abuse, leisure/recreation, personality/behavior, attitudes/orientation. Items within each domain are added to generate a need score. In addition, an overall risk is calculated based on the entire checklist, which allows youth to be classified as *low* (0-8), *medium* (9-22), *high* (23-24) or *very high* (35-42) risk. The YLS/CMI displays moderate to strong predictive accuracy for young offenders (Andrews et al., 2012; Schwalbe, 2008) and high degree of concurrent validity (Schmidt et al., 2005), interrater reliability, and internal consistency for all subscales except for substance use (Schmidt et al., 2005).

Service Match

Service matching examines the extent to which youths' identified criminogenic needs are addressed by an appropriate service during probation. Based on the probation officers' case notes, an established procedure was used to code present criminogenic need domains as either a "matched" or "not matched" based on the quantity (i.e., treatment intensity) and the quality (i.e., evidence-based) of the service received (Peterson-Badali et al., 2015; Vieira et al., 2009; Vitopoulos et al., 2012). For a service to be classified as a match, there must be either 1) consistent engagement in a non-evidence-based programming or 2) moderate engagement in an evidence-based programming. If neither condition is met, or that intervention note is missing, an identified need is coded as "not matched". The number of matched domains can be divided by the total number of identified criminogenic needs to calculate an "overall proportion match" (i.e., if a youth only received a "matched" service for three out of the six identified YLS/CMI needs, then the overall proportion match would be one half, or 0.5; Kapoor, Peterson-Badali & Skilling, 2018).

Recidivism Data

Recidivism data were obtained from a national police criminal records database and corroborated with probation case notes. For this study, recidivism was defined as new conviction(s) within 3 years following the youth completion of court-ordered assessment for the offense that led to their entry to the sample (Vitopoulos et al., 2012). To allow time for service initiation, new convictions within 3 months of the assessment were not counted (McCormick et al., 2017).

Analytic strategy

First, we reported descriptive information on a forensic sample of Canadian youth and the correlations between criminogenic needs and mental health disorders in youth with and without SUD. Next, we compared the average criminogenic need/mental health need scores between a group of youth with and without SUD using t-tests to determine if the differences between the groups were statistically significant. Second, we reported how well youth were matched with services they need while on probation for each criminogenic need domain (e.g., how well are youth with education needs matched to education services?) and we compared the match rates for youth with and without SUD. Then, we compared the average scores between SUD/non-SUD using t-tests to determine if the differences for service need match and risk scores youth were statistically significant. Finally, we used match scores in each area of need (e.g., family, leisure, etc.) as variables to build models predicting recidivism (logistic regression) for a group of youth with SUD and a group without SUD.

Results:

Table 1: Descriptive Statistics for the Overall Sample and as a function of Substance Abuse

| Measure | Overall sample | | | Non-substance use sample | | | Substance use sample | | | t | d |
|----------------------|----------------|-------|------|--------------------------|-------|------|----------------------|-------|------|----------|------|
| | N | M | SD | N | M | SD | N | M | SD | | |
| YSR | | | | | | | | | | | |
| Anxiety | 462 | 5.09 | 4.46 | 282 | 4.14 | 3.97 | 180 | 6.58 | 4.77 | 5.72** | 0.56 |
| Withdrawn/Depressed | 462 | 4.74 | 3.06 | 282 | 4.24 | 2.92 | 180 | 5.52 | 3.13 | 4.38 | 0.42 |
| Somatic Complaints | 462 | 3.45 | 3.28 | 282 | 2.78 | 2.98 | 180 | 4.51 | 3.45 | 5.54* | 0.54 |
| Social Problems | 462 | 3.96 | 3.40 | 282 | 3.22 | 3.21 | 180 | 5.12 | 3.37 | 6.02 | 0.58 |
| Thought Problems | 461 | 3.97 | 3.60 | 281 | 3.15 | 3.19 | 180 | 5.23 | 3.84 | 6.05 | 0.59 |
| Attention Problems | 462 | 6.66 | 3.92 | 282 | 5.57 | 3.79 | 180 | 8.36 | 3.50 | 8.07 | 0.76 |
| Delinquency | 462 | 9.59 | 5.70 | 282 | 6.93 | 4.07 | 180 | 13.76 | 5.40 | 14.53*** | 1.43 |
| Aggressive Behaviour | 461 | 9.26 | 6.38 | 281 | 7.19 | 5.49 | 180 | 12.48 | 6.36 | 9.17* | 0.89 |
| YLS/CMI | | | | | | | | | | | |
| Family | 458 | 3.02 | 1.62 | 281 | 2.68 | 1.62 | 177 | 3.56 | 1.47 | 6.04 | 0.57 |
| Criminal History | 462 | 1.82 | 1.71 | 282 | 1.49 | 1.58 | 180 | 2.34 | 1.77 | 5.30** | 0.51 |
| Education/Employment | 460 | 4.09 | 2.03 | 281 | 3.80 | 2.07 | 179 | 4.53 | 1.87 | 3.89 | 0.37 |
| Peer | 460 | 2.58 | 1.28 | 281 | 2.30 | 1.32 | 179 | 3.02 | 1.08 | 6.41 | 0.60 |
| Substance Abuse | 460 | 2.13 | 1.66 | 281 | 1.32 | 1.29 | 179 | 3.41 | 1.34 | 16.59 | 1.59 |
| Leisure | 458 | 1.83 | .87 | 279 | 1.65 | .93 | 179 | 2.12 | .66 | 6.36*** | 0.58 |
| Personality | 460 | 3.49 | 2.12 | 281 | 3.23 | 2.13 | 179 | 3.89 | 2.05 | 3.33 | 0.32 |
| Attitude | 460 | 1.98 | 1.66 | 281 | 1.80 | 1.69 | 179 | 2.26 | 1.59 | 2.91 | 0.28 |
| Total Score | 456 | 20.97 | 8.73 | 279 | 18.31 | 8.51 | 177 | 25.16 | 7.33 | 9.12* | 0.86 |

***. Correlation is significant at the 0.001 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 1 shows the sample population is in the range for medium-risk level (10-21) with the mean total score of 20.97 ($SD = 8.73$) on the YLS/CMI. The SUD-sample had a total score 25.16 ($SD = 7.33$) falls within the high-risk range (22-31) and the non-SUD sample had a total score 18.31 ($SD = 8.51$) falls within the medium-risk range. Independent samples t-tests analysis was conducted to compare SUD youths and non-SUD youths on all YLS/CMI measures. Criminal history and leisure were the only YLS/CMI scales that demonstrate significant differences; both measures displayed medium effect size magnitude.

The t-test results reported in Table 1 show that SUD-sample scored significantly higher than non-SUD sample on measures of anxiety, somatic complaints, delinquency, and aggressive behavior on the YSR. The difference would be considered as medium effect size magnitude for the anxiety and somatic complaints measures and large effect size magnitude for the delinquency and aggressive behavior measures. No significant differences were observed on any of the other YSR subscales.

Table 2: Pearson Correlations between YSR and YLS/CMI in Non-SUD Youth

| Measure | Family | Criminal History | Education/ Employment | Peer | Substance Abuse | Leisure | Personality | Attitude |
|---------------------|--------|------------------|-----------------------|------|-----------------|---------|-------------|----------|
| YSR | | | | | | | | |
| Anxiety | .09 | .08 | .13 | .00 | .07 | -.09 | .14 | -.17* |
| Withdrawn/Depressed | .06 | .00 | .04 | .14 | .06 | -.00 | .07 | -.09 |
| Somatic Complaints | .02 | -.01 | .06 | .01 | .07 | -.09 | .07 | -.18* |
| Social Problems | .09 | .00 | .07 | -.00 | .05 | -.04 | .15* | -.13 |
| Thought Problems | .08 | -.03 | .04 | -.01 | .02 | -.11 | .09 | -.13 |
| Attention Problems | .15* | -.03 | .19** | .11 | .06 | .04 | .31** | .05 |
| Delinquency | .26* | .08 | .27** | .11 | .29** | -.02 | .29** | .18* |
| Aggressive Behavior | .23** | .12 | .35** | .14 | .23** | .12 | .47** | .21** |

***. Correlation is significant at the 0.001 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 3: Pearson Correlations between YSR and YLS/CMI in SUD Youth

| Measure | Family | Criminal History | Education/ Employment | Peer | Substance Abuse | Leisure | Personality | Attitude |
|---------------------|--------|------------------|-----------------------|------|-----------------|---------|-------------|----------|
| YSR | | | | | | | | |
| Anxiety | .09 | .08 | .13 | .00 | .07 | -.09 | .14 | -.17* |
| Withdrawn/Depressed | .06 | .00 | .04 | .14 | .06 | -.00 | .07 | -.09 |
| Somatic Complaints | .02 | -.01 | .06 | .01 | .07 | -.09 | .07 | -.18* |
| Social Problems | .09 | .00 | .07 | -.00 | .05 | -.04 | .15* | -.13 |
| Thought Problems | .08 | -.03 | .04 | -.01 | .02 | -.11 | .09 | -.13 |
| Attention Problems | .15* | -.03 | .19** | .11 | .06 | .04 | .31** | .05 |
| Delinquency | .26* | .08 | .27** | .11 | .29** | -.02 | .29** | .18* |
| Aggressive Behavior | .23** | .12 | .35** | .14 | .23** | .12 | .47** | .21** |

***. Correlation is significant at the 0.001 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 2 presents correlations of the eight YLS/CMI domains and the eight YSR scales from the non-SUD sample. Delinquency on the YSR was associated with higher scores in all criminogenic risk domain on the YLS/CMI. The YSR measure of aggressive behavior had small correlations to four out of eight criminogenic need domains (family, peers, personality, and education/employment). While anxiety and somatic complaints were not correlated to any of the YLS/CMI scales, they were correlated with decreased problems in the attitude domain by $r=-.15$ and $r=-.12$ in the respective order (i.e., attitudes, values, beliefs, and rationalizations supportive of crime) on the YLS/CMI.

Table 3 presents correlations of the eight YLS/CMI domains and the eight YSR scales from the SUD sample. Delinquency on the YSR was associated with higher scores in five out of eight criminogenic need domains (family, education/employment, substance abuse, personality, and attitude). The YSR measure of aggressive behavior had significant correlations to the same five criminogenic need domains as stated for delinquency on YSR. Attention problems, additionally, were associated with increased problems in the same three of the five criminogenic need domains for delinquency and aggressive behavior: family, education/employment, and personality. Anxiety ($r=-.17$) and somatic complaints ($r=-.18$) were correlated to decreased problems in the YLS/CMI measure of attitude. Additionally, social problems ($r=.15$) were found to be associated with higher scores in the YLS/CMI personality domain.

Table 4: Pearson Correlations between YLS/CMI scores and Probation Match for non-SUD Youth

| Measure | Family | Criminal History | Education/ Employment | Peer | Substance Abuse | Leisure | Personality | Attitude |
|-------------------|--------|------------------|-----------------------|--------|-----------------|---------|-------------|----------|
| YSR | | | | | | | | |
| Family Match | -.30** | .05 | -.13 | -.18 | -.23* | -.09 | .13 | -.05 |
| Education Match | -.25* | .05 | -.19 | -.16 | -.24* | -.11 | -.03 | -.15 |
| Employment Match | -.12 | -.26 | -.17 | -.21 | -.10 | -.02 | -.07 | -.25 |
| Substance Match | .19 | .01 | -.11 | .06 | .39** | .19 | .05 | -.15 |
| Personality Match | .19 | -.01 | -.20 | -.21 | -.12 | -.21 | .03 | -.20 |
| Attitude Match | .18 | -.10 | -.04 | -.01 | .04 | -.01 | -.04 | -.11 |
| Leisure Match | -.32** | -.24 | -.36** | -.42** | -.43** | -.55** | -.28* | -.33** |
| Peer Match | -.15 | -.07 | -.18 | -.13 | -.21 | -.28* | -.18 | -.14 |

***. Correlation is significant at the 0.001 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 4 presents the correlations of the probation match score to the eight YLS/CMI domains from the non-SUD youths. Leisure match were associated with lower score on all domains on the YLS/CMI, except for the family domain. Peer match was also correlated with decreased problem in the YLS/CMI leisure domain. In regards to substance use problems on the YLS/CMI, family match and education match were associated with decreased scores while substance use match was associated with increased scores of the criminogenic need need.

Table 5: Pearson Correlations between YLS/CMI scores and Probation Match for SUD Youth

| Measure | Family | Criminal History | Education/ Employment | Peer | Substance Abuse | Leisure | Personality | Attitude |
|-------------------|--------|------------------|-----------------------|------|-----------------|---------|-------------|----------|
| YSR | | | | | | | | |
| Family Match | -.29* | .06 | .06 | .15 | -.17 | .05 | .09 | .09 |
| Education Match | -.42** | -.06 | -.31* | -.18 | -.16 | -.09 | -.13 | -.18 |
| Employment Match | -.40* | -.01 | -.31 | .13 | -.27 | .16 | -.06 | -.09 |
| Substance Match | .04 | .12 | -.17 | -.17 | .17 | .03 | -.05 | -.12 |
| Personality Match | -.28* | .09 | -.35* | -.11 | -.35* | -.20 | .13 | -.17 |
| Attitude Match | -.33* | -.13 | -.32* | .07 | -.31* | -.05 | -.09 | -.06 |
| Leisure Match | -.38** | -.25 | -.42** | -.12 | -.12 | -.05 | -.21 | -.24 |
| Peer Match | -.29* | .00 | -.17 | .18 | -.16 | .08 | -.06 | .03 |

***. Correlation is significant at the 0.001 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 5 presents the correlations of the probation match score to the eight YLS/CMI domains from the SUD youths. Probation match in all domains were associated with decreased problems in criminal history on the YLS/CMI, except for substance use match. For education/employment problems, match on the domain of education, personality, attitude, and leisure were associated with decreased score in that domain. Moreover, personality and attitude match were correlated to lower score on the YLS/CMI substance use domain.

Table 6: T-test for Probation Match Level and Criminogenic Need as a function of Substance Abuse

| Measure | Overall sample | | | Non-substance use sample | | | Substance use sample | | | t | d |
|-----------------|----------------|------|------|--------------------------|------|------|----------------------|------|------|---------|------|
| | N | M | SD | N | M | SD | N | M | SD | | |
| Probation Match | | | | | | | | | | | |
| Family | 135 | 1.14 | 1.33 | 69 | 1.25 | 1.34 | 66 | 1.03 | 1.31 | -.95* | 0.17 |
| Education | 146 | 1.51 | 1.38 | 78 | 1.65 | 1.38 | 68 | 1.35 | 1.37 | -1.32 | 0.22 |
| Employment | 70 | 1.27 | 1.40 | 32 | 1.09 | 1.40 | 38 | 1.42 | 1.41 | .97 | 0.23 |
| Substance Use | 104 | .75 | 1.25 | 36 | .33 | .93 | 68 | .97 | 1.35 | 2.83*** | 0.55 |
| Personality | 131 | 1.12 | 1.39 | 69 | 1.03 | 1.39 | 62 | 1.23 | 1.40 | .81 | 0.14 |
| Attitude | 87 | .82 | 1.17 | 37 | .70 | 1.08 | 50 | .90 | 1.23 | .79 | 0.17 |
| Leisure | 118 | .87 | 1.34 | 62 | 1.02 | 1.43 | 56 | .71 | 1.22 | -1.24 | 0.23 |
| Peer | 128 | .59 | 1.07 | 68 | .59 | 1.11 | 60 | .58 | 1.03 | -.03 | 0.01 |

***. Correlation is significant at the 0.001 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

*. Correlation is significant at the 0.05 level (2-tailed)

Table 6 presents the independent sample *t*-test analysis show that there was a significant difference for family match between the two samples with a small magnitude difference. In addition, SUD and non-SUD youths were also significantly different for the substance use match with a medium effect size. Other differences between the two samples did not reach statistical significance.

An attempt was made to run the logistic regression on the sample; however, the analysis could not be done due to small sample size.

Discussion

The purpose of this study was to gain a better understand of the interrelationships among substance use, mental health issues, criminogenic needs and the extent to which these needs were addressed during probation in a sample of young offenders. The rate of youth meeting criteria for a SUD in the present study population at nearly 40% consists with the typical prevalence rates of SUD observed in U.S. justice-involve youth (Sales et al., 2018). The results of this research show that youth with SUD had higher risk and need than non-SUD youth according to the total score of the YLS/CMI. Additionally, youth with and without SUD were different on some of the YLS/CMI criminogenic domains and YSR measures of mental health concerns. These results were consistent to previous findings documenting that youth with substance-related issues demonstrated more serious criminogenic need profiles (Guebert and Olver, 2014) and experienced higher rates of mental health concerns like mood and anxiety disorders (Grant et al., 2004).

Mental Health Concerns and Criminogenic Need

Measures of delinquency and aggression were associated with increased criminogenic need profiles, while anxiety, withdrawn/depressed, somatic complaints, and cognitive problems (thought problems, social problems, and attention problems) were generally unrelated to criminogenic risk among both SUD and non-SUD youth. That is, youth with externalizing behaviors (i.e., rule-breaking behaviors and aggressive behaviors) often displayed a serious criminogenic need profiles in more YLS/CMI categories. It is interesting, however, that delinquency did not correlate with all criminogenic need domains.

The findings suggest that internalizing mental health concerns related to moods, cognitive, and social problems do not correlate with risk, even in a sample of SUD youth. Conversely, externalizing behaviours in addition to an SUD diagnosis appear to be relevant to increased criminogenic risk and need among young offenders. This pattern of result is consistent with the previous literature by Terzian et al., (2011) that youth with externalizing problems are more likely to be involved in criminal behavior and substance abuse. Additionally, the results are also consistent with the claim that internalizing syndromes related to “subjective distress and poor emotional wellbeing” tend to not covary with risk (Guebert and Olver, 2014, p. 306-307). Overall, the present study also suggests that young offenders experiencing mental health and substance use dual diagnoses would benefit from more intensive treatment programs to address the elevated criminogenic needs and risk.

Probation Match and Criminogenic Need

In general, the present study results show that probation match in any domain tended to decrease risk regardless of the criminogenic needs. Leisure match, for instance, was associated with lower criminogenic need in seven out of eight criminogenic need domains among non-SUD youth. In addition, the present findings suggest the quality of treatment-to-need match tended to vary by the sample, criminogenic need area and risk level. In the sample of SUD youth, three out of the top four criminogenic need domains (education/employment, family, and substance abuse) received some moderate probation match to manage risk. Substance use match to substance use need, however, was insignificant for the SUD youth. Interestingly, non-SUD youth had the most YLS/CMI to need match occurred on the substance use domain above their identified top needs. Paradoxically, substance match to manage substance abuse *increased*, rather than decreased, the risk among non-SUD youth. Overall, the findings suggest that even though there were some alignments between youth's need and the service they received on probation, to address the risk there is need for improvement in the implementation of service-to-need match in specific domains such as substance abuse area.

The results are consistent with the extent literature in implicating the quality of implementation of service-to-need-match in the context of juvenile probation (i.e., Luong and Wormith, 2011; Peterson-Badali et al., 2015; Vierira et al., 2009). These studies reported less than half of youth received the services they need while on probation, particularly if it occurs outside of substance use and family problems domain. In regards to substance use domain, however, the present study reported for relatively poor matching is contrary to findings elsewhere documenting good matching for substance abuse services (Nelson & Vincent, 2018; Luong and Wormith, 2011). It is possible that, as Nelson and Vincent (2018) suggested, that the quality of service-to-need matching varied by site in addition to criminogenic need area and risk level. Barriers to effective implementation of the need principle in practice included real-world factors such as lack of service, limitation to the number of concurrently received service, etc.

Limitations and Future Direction

There are some potential limitations that may have impacted the findings of the present study. The most substantive limitation was that there was not enough data to run the logistic regression necessary to elucidate the association between service-need-match and future reoffending. Consequently, the paper did not effectively demonstrate the Risk principle from the Risk-Need-Responsivity model. Furthermore, the implication of the study on the Responsivity principle was also limited because it was unclear from the study whether addressing both mental and substance use issues in individuals with dual diagnosis led to better recidivism outcomes than those with only one need addressed.. Future research may benefit from replicating and extending the research question on a larger sample of demographically representative young offenders. Additionally, a further examination into potential explanations for the overtreatment of low-risk youth and undertreatment of high-risk youth in certain area of criminogenic needs

may be fruitful in overcoming the barriers that prevent quality implementation of service-to-need match in the context of juvenile probation.

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