The Comorbidity of Psychiatric and Substance Use Disorders among Hispanic Adolescents

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Abstract

Objectives: The comorbidity of psychiatric disorders and substance abuse disorders among adolescents and adults is well-documented in the literature (Colder et al., 2013). The current study investigates the relationship between psychiatric and substance use disorders in a sample of treatment-seeking Hispanic adolescents.

Methods: The study uses baseline data ($N = 190$) from a randomized control trial testing the effectiveness of a family-based treatment for Hispanic adolescents with substance abuse disorder to examine the relationship between psychiatric disorders and substance use patterns at baseline, including types of substances used (both lifetime use and past month use) and age of onset of substance use controlling for age and gender.

Results: Linear regression models were used to examine predictors of age of onset while logistic regression models examined predictors of lifetime substance use. Significant findings predicting age of onset for marijuana and alcohol are discussed. Additionally, psychiatric profiles were differentially associated with lifetime sedative, stimulant, and hallucinogens, but not alcohol and marijuana.

Conclusions: Findings from this study can be used to help inform the treatment of adolescents seeking mental health and substance use services.

Keywords

Hispanic; adolescents; substance use; psychiatric symptoms

The relationship between substance use and psychiatric conditions has been well-documented in the literature on adolescents (Colder et al., 2013; Swendsen et al., 2012; Zeitlin, 1999) and adults (Kandel, Huang, & Davies, 2001; Turner & Lloyd, 2003). In fact,

co-occurring psychiatric conditions and substance use appears to be the rule rather than the exception. This phenomenon has been observed in both population studies (Armstrong & Costello, 2002; Boys et al., 2003) and treatment samples (Chan, Dennis, & Funk, 2008; Couwenbergh et al., 2006).

Substance abuse is associated with both externalizing disorders such as oppositional defiant disorder (ODD), attention deficit hyperactivity disorder (ADHD), or conduct disorder (CD), and internalizing psychiatric disorders such as anxiety or depression. Data from studies indicate that anywhere between 55% and 88% of adolescents in treatment for substance use problems meet criteria for a psychiatric disorder, namely conduct disorder, ADHD, depression, and anxiety (Grella, Hser, Joshi, & Rounds-Bryant, 2001; Mason, Aplasca, Morales-Theodore, Zaharakis, & Linker, 2016). In a study with Hispanic and African American youth in outpatient treatment and meeting criteria for a DSM-IV substance abuse disorder, 86% of the Hispanic youth and 88% of the African American youth met cut-off criteria for at least one co-occurring psychiatric diagnosis (Robbins et al., 2002). In a meta-analysis for the National Institute on Drug Abuse, Costello, Armstrong, and Erkanli (2000) found that youth with a substance use disorder were at a five to seven times higher risk for co-occurring disruptive behavior disorders than those not diagnosed with a substance use disorder. These authors also found that substance abusing youth were roughly four times more likely to suffer from co-occurring depression and twice as likely to meet diagnostic criteria for an anxiety disorder (Costello et al., 2000). More recently, Hawkins (2009) confirmed that among adolescents, co-occurring disorders are "highly prevalent and difficult to treat" (pp. 197).

The presence of co-occurring substance use and psychiatric disorders is also associated with higher levels of dysfunction and poorer treatment outcomes than those associated with either of these conditions in isolation. Research has shown that youth with multiple co-occurring disorders, specifically with both internalizing and externalizing diagnoses, have higher levels of dysfunction, including legal problems, mental health issues, family dysfunction, increased substance use, polysubstance use, and poorer treatment outcomes (Hawkins, 2009; Rowe et al., 2004; Shane, Jasiukaitis, & Green, 2003).

Comorbidity and Substance Use Profiles

One factor that has not been extensively studied is whether specific co-occurring profiles are associated with different patterns of drug use, specifically types of substances used and age of onset. A unique challenge is understanding whether particular substances may be more strongly linked with specific co-occurring psychiatric disorders (Bukstein, Brent, & Kaminer, 1989; de Graaf, Bijl, Smit, Vollenbergh, & Spijker, 2002; Grant et al., 2004; Kessler et al., 1997; Merikangas et al., 1998; Schuckit et al., 1997). To better understand these relationships, some researchers have evaluated differences between those with internalizing disorders, externalizing disorders, and mixed internalizing and externalizing disorders (Rowe et al., 2004). In evaluating the relationship between use of specific substances and co-occurring disorders there is evidence that internalizing disorders may be more commonly associated with alcohol or marijuana use, while externalizing disorders are associated with polysubstance use (Conway et al., 2013; Salom, Betts, Williams, Najman, &

Alati, 2016; Salom, Williams, Najman, & Alati, 2015). There is little disagreement that early-onset substance use is associated with increased risk of continued use and substance use disorder. This has been shown for both alcohol and illicit substance use with early onset leading to later substance use diagnoses (Breslau, Fenn, & Peterson, 1993; Brook, Brook, Zhang, Cohen, & Whiteman, 2002; Chen, O'Brien, & Anthony, 2005; Dewit, Adlaf, Offord, & Ogborne, 2000; Grant & Dawson, 1997; Nelson & Wittchen, 1998).

Examining what we know about co-occurring and early onset profiles factors in Hispanic/Latino adolescents

While the prevalence of co-occurring disorders and their link to adverse outcomes have been well established, there is conflicting evidence in the literature, particularly among ethnic minority populations and Hispanics in particular. Hispanic/Latino youth report the highest rates of feeling sad or hopelessness in the past year when compared to non-Hispanic White and Black youth (CDC, 2015), and they also report higher prevalence of ever having used marijuana than non-Hispanic White youth (CDC, 2015). While some research has shown that Hispanics have higher rates of comorbid disorders (Couwenbergh et al., 2006) as well as higher rates of substance use, particularly in early adolescence (Gil, Wagner, & Tubman, 2004; Swendsen et al., 2012), other studies suggest lower rates of comorbid disorders (Armstrong & Costello, 2002) and lower rates of substance use, particularly in adulthood (Pacek, Malcolm, & Martins, 2012).

With regard to age of onset, Pacek et al. (2012) found that among Hispanic-, White-, and African American-identified respondents reporting substance use disorders, Hispanics were likely to have been younger when they first used. Thus, even in light of this evidence suggesting lower rates of use among Hispanic respondents, findings of earlier-onset substance use are concerning when coupled with the long-term effects and early-occurring developmental disruptions. While the link between early onset substance use and subsequent problematic use is clear, the associations between co-occurring psychiatric conditions and age of onset is not as well documented, particularly among Hispanics.

Evidence of earlier onset substance use, high rates of co-occurring psychiatric symptoms, and unique immigration and acculturation stressors suggest a concerning long-term trajectory for Hispanic adolescents affected by these disorders., Longitudinal research has shown that increases in both attentional and conduct problems during middle-childhood may be associated with higher rates of substance use, abuse, and dependence in late-adolescence and young adulthood (Fergusson, Horwood, & Ridder, 2007), and this may be particularly evident in Hispanic youth (Robbins et al. 2002).

Proposed Study

It is critical that the field more clearly understand the emergence of and implications for treatment of these constellations of substance use and psychiatric symptomatology within specific populations. The current study has several aims: (1) to investigate the profile of co-occurring disorders in a sample of Hispanic adolescents seeking treatment for substance use disorders, (2) to investigate whether co-occurring profiles are related to age of onset for

various classes of drugs, and (3) to investigate whether co-occurring profiles are related to specific types of drug use. These issues will be explored by analyzing the patterns and associations between age of substance use onset, co-occurring diagnoses categorized into (a) substance use disorder only, (b) substance use disorder and internalizing disorders, (c) substance use disorder and externalizing disorders, and (d) substance use disorder and mixed internalizing and externalizing disorders, and substances used (both lifetime and past month use) in a treatment sample of Hispanic adolescents. Moreover, treatment implications based on this study's results will also be addressed.

Method

This study uses baseline data from a randomized control trial testing the efficacy of a family-based treatment for Hispanic adolescents with substance abuse disorder. The study enrolled 190 participants into the treatment or control conditions. Baseline data on psychiatric symptoms lifetime drug use and past 30 day substance use were analyzed in this study.

Participants

Data from 190 Hispanic adolescents between the ages of 14 and 17 ($M = 15.95$, $SD = 1.06$) who met DSM-IV TR criteria for substance abuse disorder and lived with a parent who identified as Hispanic were included in this study. Participants were referred by community clinics, juvenile justice diversion programs, school counselors, and from the community and were recruited directly into the research study.

Procedures

Referral site staff was trained about the nature of the program and its inclusion criteria so that they could provide a preliminary description of the study. Staff obtained permission for families to be contacted by research study staff or, more frequently, they provided the program information to the families so that they could initiate the contact. Once contact occurred, study staff explained the program in detail over the phone and then again in person if the family agreed to come to the offices. Participants who did not meet criteria or who preferred to receive treatment outside of a research context were provided another set of placement referrals. At the intake assessment, family consent and adolescent assent were obtained, and intake assessments were completed in the participants' preferred language (English or Spanish) by masters-level assessors who were experienced bilingual interviewers. Assessors received extensive training on proper administration of all interview and self-report measures used in the program. Families were randomized into Culturally Informed and Flexible Family-Based Treatment for Adolescents (CIFFTA) or Traditional Family Therapy + Group Therapy conditions. A senior investigator randomized participants stratifying by number of arrests in the past 90 days, whether they were mandated to treatment or not, and drug use severity. Youth and families were in treatment for approximately four months in both conditions. The study was approved by the university Institutional Review Board (IRB code number 20100055).

Measures

Data from this study were generated from a small subset of baseline measures gathered during the intake interview. The full set of measures are not included in this manuscript. All youth referred to the program had self-reported substance use to the referring individual. A screening form created and used in the investigator's previous NIDA funded randomized trials based directly on the DSM-IV TR criteria for Substance Use Disorder was used to determine whether the youth met inclusion criteria. Adolescents were asked to self-report lifetime substance use and past month use for various substances, including alcohol, cigarettes, marijuana, and other illicit drug use as well as age of onset. For the purpose of this study, participants listed up to ten different types of drugs they had used. Those drugs were then classified into the following categories: (a) alcohol (beer or liquor), (b) marijuana (including synthetic marijuana and marijuana laced with cocaine), (c) stimulants (including powder cocaine, marijuana laced with cocaine, crack cocaine, amphetamines, and methamphetamines), (d) sedatives (including barbiturates and benzodiazepines), and (e) hallucinogens (including lysergic acid diethylamide [LSD], inhalants, phencyclidine [PCP], ketamine, mushrooms, and dextromethorphan). While there were also some participants in the sample that reported opioid use, the majority of them had also reported using sedatives. Due to the significant overlap between these two categories (sedatives and opioids) as well as the small sample size of the opioid only group ($n = 4$), we were not able to examine opioid use exclusively. Lifetime and past month use for each type of drug as well as age of onset for each of these categories were examined.

Parents and adolescents completed the Diagnostic Interview Schedule for Children (DISC) Predictive Scales (DPS, Lucas et al., 2001), a symptom checklist that has been found to strongly predict psychiatric diagnoses if the full DISC were administered. We evaluated criteria across a variety of mental health symptoms. Adolescents met criteria based on either parent or adolescent report. Adolescents were classified as likely to have an internalizing disorder if they met criteria for either major depressive disorder or any of the anxiety disorders, which included social phobia, separation anxiety disorder, agoraphobia, panic disorder, generalized anxiety disorder, specific phobia, and/or obsessive compulsive disorder. They were classified as likely to have an externalizing disorder if they met criteria for ADHD, CD, and/or ODD. Finally, they were classified as mixed if they met criteria for at least one internalizing and one externalizing disorder. Overall, participants were classified into likely meeting criteria for (a) substance use disorder only, (b) substance use disorder and internalizing disorder, (c) substance use disorder and externalizing disorder, or (d) substance use disorder and mixed (internalizing and externalizing) disorders.

Data Analysis

This study evaluated differences between the four psychiatric classifications described above as they relate to types of substances used and age of onset of drug use. A series of logistic regression models were used to determine whether the rates for each type of substance (alcohol, marijuana, sedatives, stimulants, and hallucinogens) were different between adolescents with co-occurring psychiatric disorders (substance use and internalizing disorder, substance use and externalizing disorder, and substance use and mixed disorder) compared to adolescents with substance abuse only after controlling for age and gender.

Linear regression models were used to determine whether psychiatric profiles predicted age of onset after controlling for age and gender.

Results

Demographics

Table 1 summarizes the demographic characteristics of the sample by gender. The adolescents in the sample were 79% male ($N = 150$), and approximately 75% were born in the US. Parents in the sample represented over 20 different countries in Central and South American and the Caribbean, with 34% of the parents born in Cuba, 19% born in the US, 9% born in Colombia, 9% born in Nicaragua, and the remaining 30% representing over 15 other countries. On average parents had lived in the US for 25.81 years ($SD = 13.27$).

Co-occurring Profiles

Of the 190 youth in this study, only 32 (16.8%) did not show symptoms consistent with a psychiatric comorbid condition; this group is referred to as the substance use disorder only group. Another 26 adolescents (13.6%) exhibited symptoms of anxiety and/or depression and were classified into the substance use disorder and internalizing disorder group. Thirty three (17.3%) of the adolescents had symptoms consistent with CD, ADHD, and/or ODD, and were classified into the substance use disorder and externalizing disorder group. Finally, in the largest group, the 99 adolescents (51.8%) exhibit symptoms of at least one internalizing disorder (anxiety and/or depression) and one externalizing disorder (CD, ADHD, and/or ODD) as well as substance use disorder and were classified into the mixed psychiatric disorder and substance use disorder group.

We also examined co-occurring profiles by gender in order to determine whether the proportion of males and females in each of the psychiatric groups were similar. The results are displayed in Table 1. In our sample, the proportion of males and females across the two groups were significantly different ($\chi^2 (3, N = 190) = 9.90$, $p = .019$). While the proportion of males (14%) and females (13%) in the internalizing disorder and substance use disorder group were similar, they were different in all other groups. Twenty percent of the males and 5% of the females were in the substance use disorder only group, 19% of males and 10% of females were in the externalizing disorder and substance use disorder group, and 47% of males and 73% of females were in the mixed psychiatric disorder and substance use disorder group.

Age of Onset

Linear regression models were used to determine whether age of initiation for marijuana, alcohol, stimulants, sedatives, and hallucinogens differed for adolescents with co-occurring psychiatric symptoms and substance use disorder as compared to adolescents with substance use disorder only after controlling for age and gender. The model predicting marijuana age of initiation revealed that adolescents who were younger ($\beta = 0.57$, $p < .001$), those with externalizing disorder and substance use disorder ($\beta = -0.78$, $p = .019$), and those with mixed psychiatric disorder and substance use disorder ($\beta = -2.79$, $p = .006$) started using marijuana earlier ($R^2 = .212$, $F(5, 178) = 9.58$, $p < .001$). When examining predictors of

alcohol age of onset, adolescents who were younger, ($\beta = 0.62$, $p < .001$) and those with mixed psychiatric disorder and substance use disorder ($\beta = -0.84$, $p = .031$) compared to substance use disorder only were both found to be significantly related to earlier age of alcohol initiation ($R^2 = .207$, $F(5, 128) = 6.70$, $p < .001$). Age was also a significant predictor of the age of initiation into sedative use ($\beta = 0.72$, $p < .001$) and stimulant use ($\beta = 0.68$, $p < .001$), with younger adolescents starting sedatives and stimulants earlier. Age was also a significant predictor of age of initiation of hallucinogens ($\beta = 0.60$, $p < .001$), with younger adolescents starting hallucinogens earlier and adolescents with externalizing symptoms and substance use ($\beta = -0.76$, $p = .023$) and those with mixed psychiatric disorder and substance use disorder ($\beta = -0.85$, $p = .002$) initiating hallucinogens earlier as compared to those with substance use disorder only.

Lifetime Substance Use

Our results indicate that 97% of the sample used marijuana, 71% used alcohol, 28% used sedatives, 18% used stimulants, and 18% used hallucinogens. While rates of illicit substances were very similar by gender, we found that more females reported lifetime alcohol use compared to males (83% and 68%, respectively). A table of the proportion of adolescents using the various substances by psychiatric profile is presented in Table 2.

A series of logistic regression models were used to determine whether the likelihood of ever using marijuana, alcohol, sedatives, stimulants, or hallucinogens differed between adolescents with substance use disorder only as compared to those with internalizing disorder and substance use disorder, externalizing disorder and substance use disorder, and mixed psychiatric disorder and substance use disorder after controlling for age and gender. A summary of the model and variable statistics are presented in Table 3.

While the model predicting lifetime marijuana use was statistically significant ($-2LL = 40.71$, $\chi^2(5, N = 190) = 12.57$, $p = .028$), none of the predictors were statistically significant. The model predicting lifetime alcohol use was not significant ($-2LL = 218.64$, $\chi^2(5, N = 190) = 10.00$, $p = .075$). A significant model predicting lifetime sedative use was found ($-2LL = 198.59$, $\chi^2(5, N = 190) = 18.33$, $p = .003$), with the mixed psychiatric disorder and substance use disorder group being 9.32 times more likely to have used sedatives when compared to the substance use disorder only group. The mixed psychiatric disorder and substance use disorder group was also 12.87 times more likely to have used hallucinogens than the substance use disorder only group ($-2LL = 160.59$, $\chi^2(5, N = 190) = 17.94$, $p = .003$). A significant model predicting lifetime stimulant use was also found ($-2LL = 156.78$, $\chi^2(5, N = 190) = 24.76$, $p < .001$), with both age and mixed psychiatric disorder and substance use disorder group as significant predictors, revealing that older adolescents and those with mixed psychiatric disorder and substance use disorder were more likely to use stimulants compared to adolescents with substance use disorder only.

Past Month Substance Use

In addition to examining whether psychiatric profiles were associated with lifetime drug use, we also examined whether these profiles were associated with past month substance use after controlling for age and gender. Table 4 displays the rates of past month use by

psychiatric profiles. With past month marijuana use, while adolescents with co-occurring disorders were not significantly more likely to use marijuana than adolescents with substance use disorder only, gender was found to be a significant predictor with females being 64% less likely ($OR = 0.36$, $p = .007$) to have used marijuana in the past month compared to males ($-2LL = 229.99$, χ^2 (5, $N = 190$) = 11.43, $p = .044$). The model predicting past month alcohol use was also statistically significant ($-2LL = 187.92$, χ^2 (5, $N = 190$) = 24.66, $p < .001$), with age as a significant covariate ($OR = 1.88$, $p = .001$) and adolescents with externalizing disorder and substance use disorder being over four times more likely to have consumed alcohol in the past month as compared to adolescents with substance use disorder only ($OR = 4.30$, $p = .027$). Models predicting sedative use ($-2LL = 52.96$, χ^2 (5, $N = 190$) = 7.00, $p = .221$), stimulant use ($-2LL = 73.72$, χ^2 (5, $N = 190$) = 4.61, $p = .465$), and hallucinogen use ($-2LL = 41.21$, χ^2 (5, $N = 190$) = 5.03, $p = .412$) in the past month were all nonsignificant, likely due to the small number of adolescents consuming these types of drugs in the past month.

Discussion

This study, based on a sample of Hispanic youth entering substance abuse treatment, investigated the profiles of co-occurring disorders, whether co-occurring profiles are related to age of onset for alcohol and drug use, and whether co-occurring profiles are related to specific types of drug use both in terms of lifetime use and past month use. Additionally, we examined these relationships after controlling for age and gender. We validated that the presence of co-occurring psychiatric conditions among this sample was the rule rather than the exception and that certain profiles were associated with higher rates of use of particular classes of drugs as well as earlier onset of drug use. The results contribute to the body of literature for rates and patterns of substance use, age of onset, and psychiatric symptomatology among Hispanic youth and inform drug treatment counselors working with Hispanic youth.

In this study, the overwhelming majority of the sample (97%) used marijuana, and about 70% used alcohol, while less than a third used sedatives, and less than a fifth used stimulants or hallucinogens. These rates were somewhat different than those reported by Magallon-Neri, et al., (2012) in a Spanish sample of youth with very similar inclusion criteria as the study reported here; while their sample also reported marijuana as the principal drug of abuse (85%), rates of alcohol (43%) and stimulants (37%) were different. However, these differences are likely due to the fact that the level of substance use was measured differently in each of the studies.

In our sample, over 83% of youth demonstrated symptoms of a comorbid psychiatric disorder with more than half exhibiting symptoms of both internalizing and externalizing disorders. This was particularly the case for females, 73% of whom were classified in the mixed psychiatric disorder and substance use disorders group. These rates are consistent with the prevalence rates reported by Couwenbergh et al., (2006), who analyzed various studies and found that prevalence rates of comorbid psychiatric disorders range from 61% to 88% across gender. It is important to keep in mind that in a treatment sample, adolescents with comorbid psychiatric and substance abuse may be more likely to seek treatment than

those with psychiatric symptoms only or substance abuse disorder only (Armstrong & Costello, 2002). Even in a community sample, these authors found that comorbid psychiatric and substance abuse was more common than not. We remind readers that while this cross-sectional study was not able to examine the causal relationship between these factors, other authors have also summarized the high rates of psychological comorbidity with substance abuse without a unified causal direction and have attributed this phenomenon to a model of vulnerability that includes a lack of protection and increased pressures to use (Zeitlin, 1999).

The finding that over half of all adolescents and nearly three quarters of all females entering treatment for substance use have a profile that includes drug use and internalizing and externalizing disorders underlines the importance of having a treatment that can address each of these areas, the manner in which they interact, and the significance of each of these areas in a developmental context. This clinical reality led our team to develop a treatment that focuses on the role of co-occurring disorders within substance use disorder treatment. Culturally-Informed Flexible Family-based Treatment for Adolescents (Santisteban, Mena, & Abalo, 2013; Santisteban, Mena, and McCabe, 2011) is designed to address both substance abuse and psychiatric symptoms as well as family dysfunction in adolescents using a combination of family therapy, individual therapy with adolescents, and psychoeducational modules delivered to the families, parents, and/or youth..

The results of this study revealed that adolescents with mixed psychiatric disorder and substance use disorder initiated marijuana use earlier than adolescents with substance use disorder only. Little research currently exists examining this relationship. While it is easy to consider the adverse impact of such early use of marijuana in this subgroup, our study did not allow us to determine the specific sequence of onset of marijuana use in relation to internalizing and externalizing behaviors. Previous studies have shown that while externalizing symptoms often precede substance use initiation, internalizing symptoms may follow the initiation of substance use, particularly among females (Miettunen et al., 2014). This may help explain why such a large portion of our sample, who were all engaged in substance abuse, were classified as exhibiting both externalizing disorders (which may have preceded substance use initiation) and internalizing disorders (which may have developed after substance use initiation), particularly in our sample of females. While rates of alcohol and marijuana use did not differ by type of psychiatric profile in this sample, adolescents with mixed disorders and substance use disorder were more likely to use stimulants, sedatives, and hallucinogens and were also more often polydrug users. These findings are inconsistent with research that has noted that the substance use disorder only group is more likely to use stimulants than the comorbid group (Tomlinson, Brown, & Abrantes, 2004). However, they are in line with work that has shown that comorbid disorders are linked with sedative and stimulant use (Grella et al., 2001; Valentiner, Mounts, & Deacon, 2004). These findings come together to create a highly complex clinical profile that requires well developed and comprehensive treatments. This is the case because there is both complexity on the psychiatric side due to internalizing and externalizing disorders and a higher likelihood that there is poly drug use. Understanding and treating the complex interaction of psychiatric symptoms and different classes of substances in this subgroup is not an easy task; however, knowing that one complex profile may be associated with the other may help prepare counselors to assess all areas more carefully.

Finally, from the point of view of gender-related findings, it is particularly helpful to acknowledge that this most complex of profiles (i.e., mixed psychiatric and poly substance use) was most commonly found in female adolescents. When treating Hispanic adolescents using a family framework, it may be particularly important to consider whether there may be an accelerated rejection of the female adolescent by the family because of a violation of traditional gender roles and whether female adolescents may be more susceptible to the loss of family support (Zayas, Lester, Cabassa, & Fortuna, 2005). Each of these detrimental processes can be the focus of family intervention.

Limitations

One limitation of this study is that the direction of the relationship between the drug use and comorbid psychiatric disorders was not established. In the future, longitudinal studies can be used to examine the direction of this relationship. A second limitation is limited statistical power due to the small and unequal cell sizes. Additionally, the number of diagnoses and the psychiatric severity are not taken into account. Another limitation was the unbalanced distribution of gender in this sample. Our sample was predominantly male, and the females in our sample were significantly more likely to fall in the mixed psychiatric disorder and substance use disorder group. One possible explanation is that females may report psychiatric symptoms at a higher rate than males, a phenomenon observed in a similar study (Gattamorta, Mena, Santisteban, Amaro; unpublished manuscript). Another possibility is that females need to reach a higher threshold of use to be referred for substance abuse treatment. Anecdotally, therapists involved in this study often reported that female participants demonstrated more symptomatic profiles, including higher levels of family dysfunction. It would be beneficial if future research studies aimed to have a more balanced gender distribution in the sample to explore gender differences. This would allow analyses to provide greater understanding of the co-occurring profiles of adolescent girls and whether the symptomatology and behaviors reported by girls are related to or affected by the interactions with family members.

Conclusions

These findings are important because it is well-documented that complex co-occurring psychiatric profiles and substance abuse disorders are linked to adverse outcomes, including relapse (particularly for drugs other than alcohol or marijuana) and legal problems, and are likely to have higher rates of premature termination from treatment (Rowe et al., 2004; Shane et al., 2003). Additionally, early age of onset has been found to be associated with elevated risk of transitions to substance use disorder (Behrendt, Wittchen, Höfler, Lieb, & Beesdo, 2009). In order to improve outcomes for adolescents exhibiting these complex profiles, it is important for clinicians to assess and address the full spectrum of symptoms. It is clear that when presenting to treatment, psychiatric symptoms and substance abuse conditions often coexist. Therefore, substance abuse treatment for adolescents must address underlying psychiatric comorbidity. Researchers and therapists must also understand how psychiatric disorders and substance abuse influence each other.

Acknowledgements

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Table 1.

Demographic Characteristics of the Sample

	Males (N = 150)		Females (N = 40)	
	M	*SD*	*M*	*SD*
Age	15.99	1.04	15.83	1.13
Years in U.S.	14.14	3.85	13.94	4.30
	N	*%*	*N*	*%*
Born in US	114	76	29	72.5
Prefer English	114	76	37	92.5
Psychiatric Profile				
Substance Use Disorder Only	30	20	2	5
Internalizing and Substance Use Disorder	21	14	5	13
Externalizing and Substance Use Disorder	29	19	4	10
Mixed and Substance Use Disorder	70	47	29	73
Primary Parent Characteristics	*M*	*SD*	*M*	*SD*
Age	44	6.91	45.33	8.50
Years in U.S.	25.78	13.03	26.34	14.27
	N	*%*	*N*	*%*
Female	118	78.7	37	92.5
Born in US	31	20.7	6	15.0
Prefer English	51	34.0	15	37.5

Note. *M* = Mean; *SD* = Standard deviation.

Table 2.

Lifetime Substances Used by Psychiatric Profiles

Psychiatric Profile	Alcohol N (%)	Marijuana N (%)	Sedative N (%)	Stimulant N (%)	Hallucinogen N (%)
Substance Use Disorder Only (N = 32)	18 (56)	32 (100)	2 (6)	2 (6)	1 (3)
Internalizing and Substance Use Disorder (N = 26)	19 (73)	23 (89)	5 (19)	0 (0)	2 (8)
Externalizing and Substance Use Disorder (N = 33)	26 (79)	32 (97)	5 (15)	6 (18)	5 (15)
Mixed and Substance Use Disorder (N = 99)	72 (73)	97 (98)	37 (37)	27 (27)	26 (26)

Note: Rows are not summative because some participants may have reported multiple substances in their lifetime.

Table 3.

Results of Logistic Regression Models Predicting Lifetime Drug Use

Drug	Predictor	Model *p*-value	Odds Ratio	*p*	95% CI
Marijuana		.028			
	Age		0.37	.102	[0.11 – 1.22]
	Gender		0.21	.094	[0.03 – 1.30]
	Internalizing		0.00	.998	-
	Externalizing		0.00	.998	-
	Mixed		0.00	.996	-
Alcohol		.075			
	Age		1.30	.097	[0.95 – 1.76]
	Gender		2.20	.091	[0.88 – 5.49]
	Internalizing		2.02	.225	[0.65 – 6.26]
	Externalizing		2.73	.074	[0.91 – 8.22]
	Mixed		1.85	.157	[0.79 – 4.35]
Sedatives		.003			
	Age		1.15	.403	[0.83 – 1.61]
	Gender		0.93	.858	[0.41 – 2.09]
	Internalizing		3.66	.143	[0.64 – 20.78]
	Externalizing		2.63	.271	[0.47 – 14.71]
	Mixed		9.32	.004	[2.08 – 41.86]
Stimulants		<.001			
	Age		1.58	.027	[1.05 – 2.36]
	Gender		0.90	.821	[0.35 – 2.31]
	Internalizing		0.00	.998	-
	Externalizing		3.12	.189	[0.57 – 17.06]
	Mixed		6.33	.018	[1.38 – 29.12]
Hallucinogens		.003			
	Age		1.48	.057	[0.99 – 2.21]
	Gender		0.71	.493	[0.27 – 1.87]
	Internalizing		2.81	.412	[0.24 – 33.20]
	Externalizing		5.28	.141	[0.58 – 48.47]
	Mixed		12.87	.015	[1.64 – 100.89]

Note. CI = Confidence Interval.

Table 4.

Past Month Substance Use by Psychiatric Profiles

Psychiatric Profile	Alcohol N (%)	Marijuana N (%)	Sedative N (%)	Stimulant N (%)	Hallucinogen N (%)
Substance Use Disorder Only (N = 32)	4 (13)	22 (69)	0 (0)	0 (0)	0 (0)
Internalizing and Substance Use Disorder (N = 26)	3 (12)	17 (65)	2 (8)	1 (4)	1 (4)
Externalizing and Substance Use Disorder (N = 33)	13 (39)	19 (58)	1 (3)	3 (3)	0 (0)
Mixed and Substance Use Disorder (N = 99)	27 (27)	69 (70)	4 (4)	6 (6)	4 (4)

Note: Rows are not summative because some participants may not have reported any use in the past month, while others may have used more than one substance in the past month.