

3-31-2005

How diagnoses of comorbid disorders are associated with treatment entry, treatment completion and alcohol use severity among adolescents in a substance abuse treatment program

Holly Ann Buss

Florida International University

DOI: 10.25148/etd.FI14052500

Follow this and additional works at: <https://digitalcommons.fiu.edu/etd>



Part of the [Health Psychology Commons](#)

Recommended Citation

Buss, Holly Ann, "How diagnoses of comorbid disorders are associated with treatment entry, treatment completion and alcohol use severity among adolescents in a substance abuse treatment program" (2005). *FIU Electronic Theses and Dissertations*. 2027.
<https://digitalcommons.fiu.edu/etd/2027>

This work is brought to you for free and open access by the University Graduate School at FIU Digital Commons. It has been accepted for inclusion in FIU Electronic Theses and Dissertations by an authorized administrator of FIU Digital Commons. For more information, please contact dcc@fiu.edu.

FLORIDA INTERNATIONAL UNIVERSITY

Miami, Florida

HOW DIAGNOSES OF COMORBID DISORDERS ARE ASSOCIATED WITH
TREATMENT ENTRY, TREATMENT COMPLETION AND ALCOHOL USE
SEVERITY AMONG ADOLESCENTS IN A SUBSTANCE ABUSE TREATMENT
PROGRAM

A thesis submitted in partial fulfillment of the

requirements for the degree of

MASTER OF SCIENCE

in

PSYCHOLOGY

by

Holly Ann Buss

2005

To: Dean R. Bruce Dunlap
College of Arts and Sciences

This thesis, written by Holly Ann Buss, and entitled How Diagnoses of Comorbid Disorders are Associated with Treatment Entry, Treatment Completion and Alcohol Use Severity among Adolescents in a Substance Abuse Treatment Program, having been approved in respect to style and intellectual content, is referred to you for judgment.

We have read this thesis and recommend that it be approved.

Eric Wagner

Marilyn Montgomery

Jonathan Tubman, Major Professor

Date of Defense: March 31, 2005

The thesis of Holly Ann Buss is approved.

Dean R. Bruce Dunlap
College of Arts and Sciences

Dean Douglas Wartzok
University Graduate School

Florida International University, 2005

ABSTRACT OF THE THESIS

HOW DIAGNOSES OF COMORBID DISORDERS ARE ASSOCIATED WITH TREATMENT ENTRY, TREATMENT COMPLETION AND ALCOHOL USE SEVERITY AMONG ADOLESCENTS IN A SUBSTANCE ABUSE TREATMENT PROGRAM

by

Holly Ann Buss

Florida International University, 2005

Miami, Florida

Professor Jonathan Tubman, Major Professor

This study examined patterns of comorbid diagnoses and their relation to treatment entry, treatment completion and alcohol use severity in a sample of 494 adolescents involved in a substance abuse treatment program. Utilization of other treatment services was also examined.

The results revealed no significant differences among groups with various patterns of comorbid disorders in terms of retention. However, there was a trend suggesting that participants diagnosed with externalizing disorders were less likely to enter into treatment. Adolescents who used alcohol more severely were more likely to read self-help books. Results indicated that adolescents diagnosed with internalizing disorders used alcohol more severely than participants diagnosed with mixed or externalizing disorders.

Study results suggest a need for improving treatment entry for adolescents with externalizing disorders and merits further research of treatment outcomes for clients

diagnosed with internalizing disorders since these groups differ systematically from other adolescents who participated in the program.

TABLE OF CONTENTS

CHAPTER	PAGE
I. INTRODUCTION.....	1
II. LITURATURE REVIEW.....	6
Psychiatric Disorders Comorbid with Substance use Disorders: Current Trends.....	6
Comorbidity: Patterns of Associated Problems.....	9
Comorbidity and Treatment Issues.....	11
The Current Study.....	17
Research Questions.....	19
Hypotheses.....	20
III. METHODOLOGY.....	21
Participants.....	21
Measures.....	21
Substance Use Severity.....	21
Psychiatric Diagnoses and Comorbidity.....	23
Treatment Entry and Completion.....	24
Procedure.....	25
Analysis.....	26
IV. RESULTS.....	27
Demographics and Disorder Categories.....	27
Research Questions.....	30
V. DISCUSSION.....	33
Summary of Results.....	33
Synthesis of Literature Review and Results.....	37
Research Questions.....	37
Implications for Prevention and Treatment.....	45
Limitations.....	46
Directions for Future Research.....	48
REFERENCES.....	69

LIST OF TABLES

TABLE	PAGE
1. Sample Characteristics.....	50
2. Cross-tabulation of Disorder Category and Treatment Entry.....	51
3. ANOVA of Therapy Sessions Completed and Counselor Ratings by Disorder Category	52
4. Correlation Matrix of Number of Therapy Sessions Completed and Counselor Ratings by TLFB Variables.....	55
5. ANOVA of TLFB Variables by Comorbid Disorder Category.....	56
6. ANOVA of Number of Disorders by Therapeutic Services Accessed.....	59
7. ANOVA of TLFB Variables by Number of Therapeutic Services Accessed.....	60

Chapter 1: Introduction

For substance abuse treatment programs, the issue of high attrition is an important one considering that clients who drop out of treatment prematurely have the same outcomes as those who were never treated at all (Stark, 1992). For adolescents with dual or multiple psychiatric diagnoses, treatment recruitment and retention becomes an even more daunting process when one considers that they initiate alcohol and marijuana use at earlier ages, have higher rates of drug dependence, higher levels of weekly use of marijuana, heavier use of alcohol and nicotine and more often repeat treatment in different programs in comparison to youth without comorbid diagnoses (Grella, Hser, Joshi & Rounds-Bryant, 2001). Severity of drug use has been identified as a precursor of earlier treatment initiation, repeated treatment utilization, and generally poorer treatment outcomes over the course of a treatment career (Anglin, 1997).

Since youth with comorbid disorders initiate substance use earlier and exhibit more severe patterns of use, this suggests a greater need for treatment, but also that these clients are likely to fair less favorably in treatment. Considering the risks associated with comorbidity for adolescents, the issue of enhancing treatment engagement for this population is both timely and significant. If they are less likely to do well in treatment and more difficult to retain, it would seem that treatment programs may need to re-evaluate how to better serve these at-risk adolescents. Improving current understanding of how dual or multiple diagnoses impact attrition and retention in treatment, as well as how various diagnoses may influence differentially treatment entry and completion will help clinicians and treatment programs know how to serve better this population.

Background Information from Current Research Literatures

Greenbaum, Prange, Friedman and Silver (1991) found that few adolescents had substance use problems without a co-occurring diagnosis of a psychiatric disorder. This study showed that disorders most commonly comorbid with substance use problems were conduct disorder (CD) and major depression (MD). Attention deficit disorders were also documented as having significant associations with substance use disorders, but they were less common than either CD or MD.

There are some studies that suggest that depression has a significant impact on severity of substance use, such as Henry, et al. (1993). This study documented a strong association between conduct disorder and the use of multiple substances, but when depressive symptoms were controlled, there was no association between conduct disorder and subsequent substance use. However, other studies suggest that depression has little impact on levels of substance use without the presence of conduct problems. Miller-Johnson, Lochman, Coie, Terry, and Hyman (1998) found that adolescents with depressive symptoms alone did not have elevated substance use levels, but those with comorbid conduct *and* depressive symptoms reported significantly higher levels of substance use than those reporting only conduct or depressive symptoms. The current literature contains some contradictions about whether the presence of a single disorder characterized by either externalizing or internalizing symptoms has a significant impact on substance use. However most of the existing studies suggest that the presence of multiple disorders do predict a greater likelihood of substance abuse problems.

In the current research literature there are many studies that suggest that having dual psychiatric diagnoses (i.e. a substance use disorder and non substance use disorder)

influences how clients react to substance abuse treatment in terms of their involvement and engagement in services versus their premature discontinuation of services. These differing reactions are related to whether the diagnoses are characterized primarily by internalizing or externalizing symptomatology. For example, Kaminer, Tarter, Bukstein, and Kabene (1992) assessed adolescents who were dually diagnosed with substance use disorders and compared those who completed a treatment program with those who did not. They found that of clients who completed the program, 24.5% were diagnosed with an affective disorder and 26.5% with an adjustment disorder, while, 78% of those who did not complete the program were diagnosed with conduct disorder. These findings suggest that clients in treatment who are diagnosed with a disorder characterized by internalizing symptoms (e.g., affective disorders) are more amenable to treatment in comparison to those diagnosed with a disorder characterized by externalizing symptoms (e.g., conduct disorder).

Sinqueland et al. (1998) confirms Kaminer's findings that clients diagnosed with affective disorders may be more amenable to treatment. This study found that clients engaged in substance abuse treatment who were also diagnosed with an Axis I disorder, and in particular depression, were more likely to remain in treatment longer than clients without a concurrent Axis I diagnosis. In contrast, Wise et al. (2001) studied adolescents admitted to a residential substance abuse treatment program to determine what factors influenced successful treatment in the program. They found that adolescents who were diagnosed with ADHD (40.0%) and conduct disorder (59.1%) were less likely to complete the program than those clients without these disorders. This finding supports

other research studies that have found that adolescents diagnosed with disorders characterized by externalizing symptoms are less amenable to substance abuse treatment.

There are a number of studies that seem to give mixed results due to poor separation of symptoms during assessment and classification. For example, Dierker Nargiso, Wiseman, and Hoff (2001) found that children and adolescents with depressed symptomatology were much more prevalent among clients who refused treatment or who dropped out of treatment prematurely than among clients who completed treatment services. At first glance, these findings would seem to suggest a contradictory outcome compared to previous research findings that internalizing symptoms were significant predictors of treatment engagement. However, this study also found that all youth who were referred for substance use problems and depressive symptoms, were also referred for aggressive/oppositional problems. This would support the findings that in the presences of any externalizing symptoms, treatment retention becomes more difficult and counteracts the possible improved treatment retention with a diagnosis of an internalizing disorder.

Purpose of Current Study

The purpose of the current descriptive study is to add to the current research literature to help clarify how the presence of specific disorders is related to initial alcohol use severity and involvement in treatment. Specifically, the present study describes how treatment entry, treatment completion and initial severity of alcohol use, in a community-based outpatient substance abuse treatment program for adolescents, differs by the presence of other Axis I disorders. Improving current understanding of how comorbidity is related to treatment entry and retention may stimulate future studies that will address

why clients with particular disorders are more or less amenable to substance abuse treatment. It is critical, therefore, to better identify which disorders or combinations of disorders are associated with increased or decreased treatment entry and completion.

Significance of Study

The proposed study contributes to existing knowledge about how the presence of comorbid psychiatric disorders is related to retention in substance abuse treatment and initial severity of alcohol use. Research is mixed about which disorders are related to greater substance use problems and the current study may help to illuminate this issue. Another important question to be clarified is how levels of treatment retention and attrition differ among clients diagnosed with externalizing disorders or mixed disorders, in comparison to clients diagnosed with internalizing disorders. Research generally suggests that clients diagnosed with disorders characterized by internalizing symptoms are more amenable to treatment, however many of the studies do not carefully separate diagnoses or symptoms to help avoid potential confound. The present study helps to clarify more specifically how different diagnoses and combinations of comorbid disorders may influence clients' entry and retention in treatment.

Participants in the current included 494 adolescents between the ages of 14 and 18 who met criteria to be involved in a substance abuse intervention program called ATTAIN (Alcohol Treatment Targeting Adolescents in Need). This program was based in Miami, Florida and participants were recruited through self-referrals, alternative schools or the judicial system. It was a substance abuse intervention program tailored for adolescents in the early stages of drug or alcohol use. The sample was not split between males and females for analytic purposes as there were significantly fewer females than

males referred to the program. The sample was also more representative of Hispanics/Latinos because of the overrepresentation of these ethnic groups in the Miami-Dade County area. The inclusion criterion for this program were at least 6 occasions of drug or alcohol use (excluding tobacco) within the last 90 days, or a drug positive urine test.

Chapter 2: Literature Review

Psychiatric Disorders Comorbid with Substance Use Disorders: Current Trends

Researchers and clinicians are increasingly recognizing the prevalence of psychiatric disorders dually diagnosed with substance use disorders among adolescents. In treatment settings, comorbidity of substance use and other mental disorders is often the rule rather than the exception. As quoted by the National Institute on Drug Abuse (NIDA, 1992), studies have shown that within substance abuse treatment programs, 30% to 50% of clients are also diagnosed with a psychiatric disorder and 50% to 70% of clients admitted for psychiatric treatment are dually diagnosed with substance disorders. Although the prevalence of comorbidity of a mental disorder and substance abuse are lower in the general population, the rates of co-occurrence are still significant. The National Comorbidity Survey (Kessler et al., 1994) revealed that for persons with a diagnosis of a mental disorder in their lifetime, the prevalence of a substance use disorder was slightly above 50%. For persons diagnosed with a substance use disorder in their lifetime, the prevalence of a mental disorder was close to 40%. It is important to note that much of the literature regarding comorbidity pertains to adults and there are fewer studies about adolescents. It is pressing that comorbidity patterns among adolescents be investigated further.

A study by Shrier, Harris, Kurland and Knight (2003) assessed adolescents diagnosed with substance use disorders, as well as those who reported substance use problems below diagnostic threshold. It was found that like those diagnosed with a substance use disorder, adolescents who did not meet diagnostic criteria for a SUD were still at increased risk for experiencing greater numbers of psychiatric symptoms in comparison to those who did not use substances. Similarly, Greenbaum et al. (1991) found that few adolescents had substance use problems without a co-occurring diagnosis of a psychiatric disorder. His study showed that the disorders most commonly comorbid with substance use were conduct disorder (CD) and major depression (MD). Attention deficit disorders also were documented as having significant associations with substance use disorders, but they were less common than either CD or MD. In another study, as many as 75% of adolescents in treatment programs for drug or alcohol abuse had one or more comorbid mental disorders, with conduct disorder, affective disorders and attention deficit disorders identified as the most commonly co-occurring diagnoses (Greenbaum Foster-Johnson & Petrila, 1996).

Although attention deficit disorders have been shown to commonly co-occur with substance use problems, a study by Disney, Elkins, McGue and Lacono (1999) concluded that when conduct disorder is controlled for, a diagnosis of ADHD had little effect on substance use outcomes in both males and females. However, when an externalizing disorder such as ADHD occurs along with an internalizing disorder (e.g., depression or anxiety), then the risk for being diagnosed with a substance use disorder increases significantly (Windle & Windle, 1993). This suggests that a diagnosis of ADHD alone is less likely to predict the presence of a comorbid substance use disorder and that there is a

stronger association between conduct disorder and substance use disorders. It also suggests that in the presence of multiple diagnoses, there is a greater likelihood to also find a diagnosis of a substance use disorder.

A study of depressed adolescents by King et al. (1996) found that significant predictors of co-occurring alcohol and substance abuse in females were longer depressive episodes, more conduct problems, psychosocial impairment, and more active involvement in intimate relationships. Conduct disorder, older age, and problems with schoolwork were identified as significant predictors of SUDs for males. Miller-Johnson et al. (1998) examined the comorbidity of conduct problems and depressive symptoms in relation to substance use outcomes during adolescence. This study found that adolescents with depressive symptoms alone did not have elevated substance use levels, but those participants with comorbid conduct problems *and* depressive symptoms did report significantly higher levels of substance use than those with a single diagnosis. These results would seem to support the King et al. (1996) article, in that depressed participants who had more conduct problems were more likely to use substances. A diagnosis of depression alone does not appear to be a significant precursor of greater substance abuse susceptibility in these two articles.

In contrast, Swandi and Bobier (2003) found that among general admission patients admitted to a youth inpatient unit, 64% were diagnosed with a comorbid substance use disorder. Sixty percent of those with a mood disorder and 63% with an anxiety disorder also had a co-occurring SUD. This study suggests that adolescents with internalizing disorders, even without the presence of externalizing symptoms, are significantly more likely to develop substance abuse problems. Another study supporting

the finding of the influence of depression on substance use problems is Henry et al. (1993). This study documented a strong association between conduct disorder and the use of multiple substances. However, when depressive symptoms were controlled, there was no association between conduct disorder and subsequent substance use.

A study of juvenile offenders by Milin et al. (1991) compared substance-abusing adolescents with non-substance abusing adolescents. It was found that 91% of the teens with a conduct disorder had a diagnosis of a co-occurring substance use disorder. However, 90% of those without a substance use disorder also had conduct disorder, which is not unexpected considering that the sample was composed of adolescents who were recruited from the juvenile justice system. Another interesting finding was that 60% of those with a SUD had triple diagnoses of addictive disorder, conduct disorder and another mental disorder, whereas this occurred in only 13.9% of the controls (those adolescents not diagnosed with an addictive disorder). The results of these studies contain some contradictions about whether the presence of a single disorder characterized by either externalizing or internalizing symptoms has a significant impact on reported levels of substance use. However, most studies suggest that the presence of multiple disorders is associated with a greater likelihood of substance abuse problems.

Comorbidity: Patterns of Associated Problems

Youth with comorbid psychiatric disorders initiate alcohol and marijuana use at earlier ages, have higher rates of drug dependence, higher rates of weekly use of marijuana, heavier use of alcohol and nicotine and are more likely to repeat treatment in different programs than adolescents without comorbid disorders (Grella et al., 2001). Early onset of substance use was also found to be the most consistent predictor of current

substance use when re-examined four years later (Windle, 1990). Research by Kennedy and Minami (1993) also confirms findings that youth diagnosed with comorbid disorders have more problematic patterns of substance use problems. In this study, psychopathology was associated with more severe marijuana and alcohol use before treatment, as well as with relapse to substance use following treatment. Another study of adolescent boys in a residential substance abuse treatment program who were diagnosed with substance dependence and conduct disorder showed improvement following treatment in their criminal behaviors and psychiatric symptoms, but showed no improvement in their substance use at a two year post-treatment examination (Crowley, Mikulick, MacDonald, Young, & Zerbe, 1998).

Severity of drug use has been identified as a precursor of earlier treatment initiation, repeated treatment utilization, and generally poorer treatment outcomes over the course of a treatment career (Anglin, 1997). Research has also documented that more severe use of alcohol and drugs contributes to higher attrition rates in treatment programs (Moos & Bliss, 1978). Alcoholics with a history of two or more alcohol-related convictions and the use of at least one illicit drug are more likely to drop out of treatment than adults with none or fewer convictions (Leigh, Ogborne & Cleland, 1994). Beckman and Bardsley (1986) found that both men and women with more severe patterns alcohol abuse who dropped out of inpatient treatment centers demonstrated more pathological patterns of drinking, as well as more symptoms of dependence.

Since youth diagnosed with comorbid disorders initiate substance use earlier and exhibit more severe patterns of use, this would suggest a greater need for treatment, but also that they are likely to fare less favorably in treatment. Considering the risks

associated with comorbidity for adolescents, the issue of treatment retention for this population becomes an important one. If they are less likely to do well in treatment and more difficult to retain, it would seem that treatment programs may need to re-evaluate how to better serve these at-risk adolescents. Improvements in current understanding of how having dual or multiple diagnoses influences substance use severity and the ability to become engaged in treatment will help clinicians and treatment programs plan better treatment services for this population.

Comorbidity and Treatment Issues

For substance abuse treatment programs, the issue of high attrition is an important one considering that clients who drop out of treatment early have the same quality of outcomes as clients who were never treated at all. Those who complete a substance abuse treatment program are more likely to abstain from alcohol and drugs, to have a less chance of relapse and to have fewer future arrests (Stark, 1992). For adolescents with dual or multiple psychiatric diagnoses, treatment engagement becomes an even more daunting process due to factors discussed above.

A study by Kaminer, Tarter, Bukstein and Kabene (1992) assessed a sample of 64 adolescents admitted to a psychiatric hospital, who were dually diagnosed with substance use disorder. This study compared clients who completed the program with clients who did not. It was found that of those who completed the program, 24.5% were diagnosed with an affective disorder and 26.5% were diagnosed with an adjustment disorder. In contrast 78% of clients who did not complete the program were diagnosed with conduct disorder. This finding would suggest that clients who are diagnosed with a disorder characterized by internalizing symptoms (e.g., affective disorders) are more amenable to

treatment, in contrast to those diagnosed with a disorder characterized by externalizing symptoms (e.g., conduct disorder).

Sinqueland et al. (1998) confirms Kaminer's findings that clients diagnosed with affective disorders may be more amenable to treatment. He found that clients engaged in substance abuse treatment who were also diagnosed with an Axis I disorder, and in particular depression, were more likely to remain in treatment longer than clients without a concurrent diagnosis of depression. It is important to note that the number of clients with concurrent depressive or anxiety disorders was low in this sample. A possible explanation for these findings is that clients suffering from depression are initially difficult to engage, however, they may be more motivated to continue with treatment once they have begun, in order to alleviate their symptoms of depression. The researchers who conducted this study only examined depression and anxiety separately, whereas clients reporting all other Axis I disorders were analyzed together and compared to clients without any concurrent psychiatric diagnoses. The opportunity to examine how adolescents diagnosed with different psychiatric disorders react to treatment in terms of engagement was lost. If clients diagnosed with specific psychiatric diagnoses had been analyzed separately, clients diagnosed with disorders characterized by externalizing symptoms (e.g., conduct disorder) may have been shown to have higher attrition rates as has been found in other studies. Current research seems to support the hypothesis that clients diagnosed with disorders with externalizing features have a significantly worse prognosis than clients diagnosed with disorders with internalizing features.

Among substance abusing adolescents in day and residential treatment programs, males and females who completed or did not complete treatment were compared on a

number of psychosocial instruments. Males with internalizing symptoms were more likely to complete treatment than clients diagnosed with other types of disorders, but females with internalizing symptoms were not any more likely to complete treatment in comparison to clients with other types of disorders (Blood & Cornwall, 1994). This would suggest a gender difference in how disorders characterized by internalization affect retention in treatment. A study by Rivers, Greenbaum and Goldberg (2001) supports previous research with respect to the finding that internalizing behavior was a significant predictor for greater attendance during treatment, while in contrast, externalizing behaviors predict greater attrition from treatment. Internalizing and externalizing symptoms in females were better predictors of both attendance and non-attendance than they were among males in this study.

Dierker, Nargiso, Wiseman and Hoff (2001) examined patterns of attrition and key characteristics of clients who did not remain active in various mental health service programs to help explain why some clients remain in a system of care and others do not. It was found that 88% of those who dropped out of treatment and 80% of those who refused treatment were referred for more than one reason, (e.g., depression, suicidality, substance abuse behaviors, etc.) while this was the case with only 60% of those who completed intervention or treatment services. Depressed symptomatology, as well as substance abuse, were found to be much more prevalent among those who refused treatment or who dropped out than among those who completed treatment. At first glance, these findings would seem to suggest a contradictory pattern of findings compared to previous research documenting that internalizing symptoms were significant predictors of better retention in treatment. However, this study also found that all youth who were

referred for substance use problems and depressive symptoms, (although they were not diagnosed with conduct or oppositional defiant disorder) were also referred for aggressive/oppositional problems, which would support the previous research findings that in the presence of any externalizing symptoms, retention in treatment becomes more difficult. In addition, it would seem that internalizing symptomatology in absence of externalizing behaviors, may be associated with improved attendance in treatment. However, if externalizing behaviors are present as well, this counteracts the potential improvement in retention.

Wise, Cuffe and Fischer (2001) studied adolescents admitted to a residential substance abuse treatment program to determine what factors were associated with successful treatment in the program. They found that females were more likely to complete the program than males (90% vs. 67%). They also found that adolescents who were diagnosed with ADHD (40%) and conduct disorder (59.1%) were less likely to complete the program than clients diagnosed with other types of disorders. This finding supports other research that found that adolescents diagnosed with disorders characterized by externalizing symptoms were less amenable to treatment and that there may be a gender difference in amenability to treatment. However, it is important to note that boys are more commonly diagnosed with disorders such as ADHD and conduct disorder (Doyle et al., 2003). The gender difference may be a reflection of the presence of an externalizing disorder influencing the level of involvement in treatment rather than gender itself.

A study by Claus and Kindleberger (2002) found that after an initial assessment, persons with a comorbid psychiatric diagnosis were approximately half as likely to

follow through to begin treatment as those without diagnoses of comorbid disorders. Clients with lower levels of psychological distress were found among persons entering drug treatment. However, this study did not separate diagnoses, so it is unknown whether those who were dually diagnosed with depression or anxiety would have been more likely to enter treatment compared to clients diagnosed with ADHD or conduct disorder. It is possible that they had a high number of clients with ADHD or CD at the initial assessment, but since all diagnoses were lumped together, it is not possible to assess differential rates of treatment entry by diagnostic category.

Another study by Friedman and Glickman (1987) assessed court-referred delinquent boys for psychiatric problems and then tested them pre and post-treatment in four functional areas. They found a consistent trend for those who reported more psychiatric symptoms to be more likely to improve significantly, suggesting that some forms of comorbidity predict better treatment outcomes. However, this may be a misleading interpretation because clients who improved significantly had greater problems at the beginning of treatment, and therefore, had more room for improvement. Those clients with fewer problems typically had a narrower range within which to improve.

Current literature suggests that having a dual diagnosis may increase or decrease one's chances of entering and completing a substance abuse treatment program, depending on whether the diagnoses are characterized primarily by internalizing or externalizing symptomatology. Clients with comorbidity, depending on the diagnosis, may feel more or less need for treatment due to the symptoms of their disorder. Clients with a diagnosis such as conduct disorder or oppositional/defiant disorder may not feel

the impact or they may deny the impact of their symptoms, and therefore they may be more difficult to engage. Also, considering the nature of these disorders, clients may be less likely to remain in treatment either because of a disregard for such institutions or a refusal to accept responsibility for progress towards treatment goals. For example, a study by Powell (2003) found that adolescents identified as having a conduct disorder were significantly more likely to utilize avoidance of responsibility strategies and had significantly more external locus of control responses, compared to non-CD subjects. Although it is not clear from the literature, it is possible that clients with a diagnosis characterized by internalizing symptoms, such as depression and anxiety, are more likely to remain in treatment in the hope of receiving relief from their symptoms (Siqueland et al., 1998). Symptomatology of specific disorders is one possible explanation for differences in levels of entry and retention among clients manifesting patterns of comorbid disorders.

Although the current study is focusing specifically on the relations among diagnostic comorbidity, the severity of alcohol use and treatment entry and completion, there are other possible explanations beyond the symptomatology of a client's disorder that may influence engagement in drug treatment. For example, some clients may not have access to reliable transportation, which could impact consistent participation in a treatment program. Another factor that could influence treatment engagement is parental attitude towards treatment. If a client's parents do not place emphasis on the importance of treatment, are indifferent or even pessimistic towards the value of treatment services for their child, this could negatively impact their child's attitude toward treatment and the parent's willingness to help the child keep appointments. For example, a study by White,

Winn and Young (1998) investigated differences between clients who completed services and clients who did not in an outpatient substance abuse treatment program. Factors that contributed to attrition included Hispanic ethnicity, absence of a professional skill, shorter time since last substance abuse treatment, cocaine or cannabis use in the last 30 days, total number of family members with drug problems, presence of emotional abuse in the last 30 days, concern with family problems, and number of family group meetings that family members attended. This list of contributing factors to disengagement from treatment demonstrates the complexity of issues that may promote attrition and that any one factor cannot explain entirely why some clients are engaged in treatment and others are not.

The Current Study

Although it is beyond the scope of the current study to document exactly why there are potential differences in attrition and retention among clients diagnosed with particular disorders, the questions are still important, but they cannot be addressed until further research has been conducted. It is also beyond the scope of this study to examine all the potential factors that may influence treatment entry and completion, so this study focused on how the presence of comorbid disorders are associated with treatment entry, treatment completion and alcohol use severity. The purpose of the present study was to help clarify relations between (a) specific disorders and (b) alcohol use severity, treatment entry, and treatment completion. Specifically, the present study describes how treatment entry, treatment completion and the initial severity of alcohol use, in a community-based outpatient substance abuse treatment program for adolescents, is associated with the presence of other Axis I disorders. In addition, clients with various

comorbid diagnoses were compared in terms of additional treatment utilization.

Improving current understanding of how comorbidity is related to treatment entry and completion may stimulate future studies that will address why those with particular disorders are more or less able to remain in treatment, once research has better identified which disorders seem to be associated with increased or decreased treatment entry and completion.

To assess how treatment entry and completion are associated with comorbid disorders, clients diagnosed with various combinations of externalizing, internalizing, mixed and substance use disorders were compared in terms of entry and completion in treatment and alcohol use severity. Groups were compared with regard to whether or not they entered into treatment, the number of therapy sessions completed and mean ratings of their therapist to determine their level of involvement in treatment. Disorders were assessed using The Composite International Diagnostic Interview (CIDI), which assesses Axis I disorders including; major depression, dysthymia, generalized anxiety disorder, phobias, panic disorder, alcohol abuse and dependence, drug abuse and dependence, ADHD and oppositional defiant disorder, all of which were the diagnoses included in the current study. Client satisfaction with their counselor was assessed using a Counselor rating Form-Short Version (CRF-S), which measured client's perception of their therapist on a number of descriptors.

To assess how comorbidity is associated with alcohol use severity, participants were compared in terms of disorder categories based on externalizing, internalizing and mixed symptomatology and substance abuse disorders and levels of use 30 days prior to baseline using a Time Line Follow Back (TLFB) assessment tool. This tool measured the

total number of alcohol drinks, total number of alcohol use days, and average number of drinks each drinking day and proportion of drug use days.

To compare clients with and without comorbid diagnoses on repeated involvement in substance abuse treatment services, a questionnaire entitled, “Involvement In Other Counseling Services,” was utilized. Clients with varying levels of alcohol use were also compared to help determine the relation between severity of alcohol use and repeated treatment utilization. This measurement tool requests that client’s answer yes or no to a list of different types of substance abuse treatment intervention services that they may have received. This instrument measured the number and type of services received prior to and throughout participants’ involvement in the ATAIN program.

Research Questions

1. How is treatment entry and completion associated with comorbid disorders?
  - a. Will clients with disorders characterized by internalizing symptoms be more likely to enter into and complete treatment?
  - b. Are levels of attrition and retention different among clients diagnosed with internalizing disorders or mixed disorders compared to clients diagnosed with externalizing disorders?
  - c. How does treatment entry and completion vary as the number of comorbid disorders increases?
2. Is treatment entry and retention associated with severity of client alcohol use?
3. How are different patterns of comorbid disorders associated with alcohol use severity?

4. Are diagnoses of comorbid disorders associated with greater likelihood of repeated treatment utilization?
5. Is severity of alcohol use associated with greater likelihood of repeated treatment utilization?

Hypotheses

1. Those diagnosed with disorders characterized by internalizing symptomatology will be more likely to enter into and complete treatment than clients diagnosed with disorders characterized by externalizing symptomatology. However, if those with internalizing symptoms also have externalizing symptoms, then the “retention effect” will be in the other direction. It is possible that as in the Milan et al. (1991) study, many of the participants will have multiple diagnoses. The Milan et al. study yielded a high rate of attrition, so it is expected that those with multiple disorders will have higher attrition from treatment.
2. Those with higher levels of alcohol use will be more difficult to retain in treatment since the current literature strongly supports more severe patterns of substance use as a factor contributing to higher attrition.
3. Research is contradictory about whether disorders with externalizing or internalizing characteristics are related to more substance use; however, all research suggests that multiple diagnoses are related to higher levels of substance use. In accordance with current research, it is expected that participants with multiple disorders in this study will also report more severe alcohol use problems than clients who report only a single or a dual diagnoses.
4. Participants with comorbid disorders will have utilized more treatment services since

current literature has found that youth with comorbid disorders are more likely to repeat treatment (Grella et al., 2001).

5. Participants with more severe patterns of alcohol use will have utilized more substance abuse treatment services since current literature has identified substance use severity as a precursor to repeated treatment utilization (Anglin, 1997).

Chapter 3: Methods

Participants

Participants in this study included 494 adolescents between the ages of 14 and 18 years who met criteria to be involved in a substance abuse intervention program called ATTAIn (Alcohol Treatment Targeting Adolescents in Need). This program was based in Miami, Florida and participants were recruited through self-referrals, alternative schools or the judicial system. It was a substance abuse intervention program tailored for adolescents in the early stages of alcohol use. The sample was not split between males and females for analytic purposes as there were significantly fewer females than males referred to the program. The sample is also more representative of Hispanics/Latinos because of the overrepresentation of this ethnic group in Miami-Dade County. The inclusion criterion for this program was at least 6 occasions of alcohol use within the last 90 days.

Measures

Alcohol use severity. The Time Line Follow Back (TLFB) calendar was used to assess the participants' patterns of alcohol use over the past 30 days at baseline (Sobell & Sobell, 1992, 1995). The TLFB is completed by starting with the current month and working back. Participants are asked how often they consumed alcohol (days/month),

what type of alcohol (e.g. whiskey, beer) and how much measured in standard drinks. Using the TLFB, the interviewer probes for patterns and also gives attention to days of abstinence. If a participant is unable to determine days of alcohol use, the researcher should use non-directive questioning to determine general information (e.g., did you use during more than half of the month or less than half of the month? Do you usually use on weekends or weekdays?). Total days per month of alcohol use are added to determine the total number of days on which alcohol was consumed. This is done to determine who could participate in the program based on inclusion criteria. This tool was also used to determine the severity of alcohol use at baseline for clients diagnosed with comorbid disorders. TLFB variables include: average number of days drinking thirty days prior to baseline, average maximum number of drinks per drinking day, average drinks per drinking day and average number of days abstinent from alcohol use. The procedures used in the TLFB have been found to minimize memory error (Babor, Brown, & Del Boca, 1990), and to be more sensitive to specific substance use patterns that are not as clear in standard self-report assessments, and to have generally high reliability (r 's > .86) (Sobell, Sobell, Klajner, Pavan, & Basian, 1986).

The Involvement in Counseling Services instrument was measured as a potential correlate of alcohol use severity. This measure is used to determine a client's involvement in other forms of treatment for alcohol abuse at each assessment occasion. Clients were asked to check yes or no to each statement about previous forms of treatment utilized which include: 1) Self-help book on alcohol problems, 2) Detox only, 3) Outpatient treatment, 4) Inpatient/Residential? Day treatment, 5) Counseling by a

professional, 6) Alcoholics Anonymous or other similar self-help groups, 7) Anti-alcohol medications and 8) Other.

Psychiatric diagnoses and comorbidity. To determine the presence of comorbid disorders, the Composite International Diagnostic Interview (CIDI) was used. The CIDI is a comprehensive, standardized instrument for assessment of mental disorders. It is a fully structured interview that maps the symptoms elicited during the interview onto DSM-IV and ICD-10 diagnostic criteria and reports whether the diagnostic criteria are satisfied. It is intended for use in epidemiological and cross-cultural studies, as well as for clinical and research purposes. It assesses participants for major depression, dysthymia, generalized anxiety disorder, specific phobia, social phobia, panic disorder, alcohol abuse, alcohol dependence, drug abuse, drug dependence, ADHD (inattentive and hyperactive-impulsive types), conduct disorder and oppositional defiant disorder. The inter-rater reliability has been demonstrated to be excellent, the test-retest reliability good, and the validity has also been shown to be good (Andrews & Peters, 1998; Wittchen, 1994). During a CIDI interview, respondents are asked questions about symptoms of psychiatric disorders. Symptom questions that are responded to positively are followed by questions from the Probe Flow Chart, which determine whether the symptom is a possible psychiatric symptom (i.e., if it is clinically significant and is not due to medication, drugs or alcohol or to a physical illness or injury). Symptom questions with a negative response will often lead to subsequent questions being skipped. Once enough symptoms have been identified suggesting that a diagnosis might be present, respondents are asked about the onset of the identified symptoms, which they have confirmed.

Based on results of the CIDI at the initial assessment, participants were placed in disorder categories. They were first categorized into twenty-one exclusive categories (presented in Figure 1) based on various patterns of substance use, externalizing, internalizing, and mixed disorders. The categories were then condensed into eight different categories (presented in Figure 2) for more concise presentations of the various patterns documented in the sample. Substance abuse disorders include: alcohol abuse, alcohol dependence, drug abuse or drug dependence. Externalizing disorders include: ADHD (inattentive and hyperactive-impulsive types), conduct disorder or oppositional defiant disorder. Internalizing disorders include: major depression, dysthymia, generalized anxiety disorder, specific phobia, social phobia or panic disorder. Mixed disorders must have at least one externalizing disorder along with at least one internalizing disorder. Categories were compared in terms of participants self-reports of treatment engagement and substance use severity.

Treatment entry and completion. To determine client involvement in treatment, entry into treatment, number of sessions completed, and participant's rating of satisfaction with their counselor was assessed. Treatment entry was assessed as a dichotomous variable indicative of whether an adolescent actually entered treatment after assignment to a treatment condition. Number of sessions was assessed as a continuous variable indicating how many treatment sessions were attended. To help determine level of rapport established between therapist and client, a Counselor Rating Form-Short Version (CRF-S) was utilized. At the post intervention assessment, adolescents rated their therapist utilizing the CRF-S (Corrigan & Schmidt, 1983). This form measures the adolescent's perception of their therapist on a list of twelve descriptors including;

friendly, firm, caring, accepting, straight-forward, expert, sensitive, competent, knowledgeable, supportive, confident, and understanding. The form uses a 7-point Likert scale ranging from *never* (1) to *always* (7) to rate each descriptor. The CRF-S is a widely-used research and clinical assessment tool with good reliability and validity for a wide range of groups of individuals (Corrigan & Schmidt, 1983)

Procedure

Participants in the ATTAIN program were recruited through self-referrals, alternative school referrals, and referrals from the juvenile justice system. During a first interview, participants and their parents signed informed consents to participate in the program. Comprehensive assessments were conducted with the adolescents and parents were given a brief assessment at the initial interview. After establishing eligibility to participate, participants were randomly assigned to one of four treatment conditions including: individual, family, choice (adolescent chooses whether he/she prefers a family member's involvement or to attend treatment individually) and the control condition of waitlist (12-week wait). ATTAIN was a randomized clinical trial (RCT) that examined the efficacy of a brief motivational intervention, (i.e., Guided Self Change) for adolescents with drug and alcohol use problems. Participants received one session a week of psychotherapy for five weeks. Adolescents could also choose to attend up to two additional sessions after completing the initial five sessions for the purposes of additional practice for booster sessions. Four follow-up assessments were completed, the first being completed directly after the last therapy session and three more follow-up assessments at three, six and nine months post-treatment. The data analyzed for the current study

consists of baseline substance use, CIDI diagnoses, involvement in other counseling services, therapist description, treatment entry, and number of sessions completed.

Analyses

The goal of this study is to help clarify how comorbid diagnoses and substance use severity are related to treatment entry and completion. Specifically, the present study examined whether the presence of internalizing, externalizing or substance use disorders are related to systematic differences in whether participants will enter and complete treatment or discontinue therapy prematurely. The proposed study also examined how treatment entry and completion differs systematically when externalizing symptoms present mixed with internalizing symptoms and substance use disorders, or when multiple disorders are present, compared with clients diagnosed with single or dual disorders. The data analyses for this study were conducted by utilizing the SPSS Windows Version 11.0 package. One-way ANOVAs, a correlation matrix, and cross-tabulation analyses were used to describe group differences in categorized variables. The participants in the current study were predominately male Hispanic White adolescents (75.8%) because of the overrepresentation of this ethnic group within Miami-Dade County and the predominance of males who were selected into the ATTAIn program.

To address the question of how treatment engagement is associated with comorbid disorders, a cross-tabulation was used to compare clients who entered treatment vs. those who did not by comorbid disorder category. An ANOVA of therapy sessions completed and counselor ratings by disorder category was also used. To address the question of how treatment engagement is associated with severity of client alcohol use, a correlation matrix was used to examine bivariate relations among number of therapy

sessions completed, scores on the CRF-S and TLFB variables. An ANOVA was conducted with TLFB variables as the dependent variables and comorbid disorder category as the independent variables to address the question of how different patterns of comorbid disorders were associated alcohol use severity. An ANOVA of involvement in counseling services by number of comorbid disorders was also utilized to address the question of whether diagnoses of comorbid disorders were associated with greater likelihood of repeated treatment utilization. Last, an ANOVA of involvement in counseling services by TLFB variables was used to address the question of whether severity of alcohol use was associated with levels of treatment utilization.

Chapter 4: Results

Results presented first are the descriptions of sample demographics, descriptions of the frequencies and patterns of disorder categories among participants in the study. Results will then be presented in the order that the research questions were proposed. An alpha level of .05 was used for all statistical tests.

Demographics and Disorder Categories

Participants in this study were predominantly male ($n = 475$, 89.8% male and $n = 54$, 10.2% female). Participants were predominately Hispanic White ($n = 360$, 75.8%) and African American ($n = 79$, 14.9%) with fewer participants being of White non-Hispanic ($n = 41$, 7.8%), Hispanic Black ($n = 25$, 4.7%) or other descent ($n = 24$, 4.5%). Sample characteristics are summarized in Table 1.

CIDI diagnoses categories were first summarized into 21 exclusive categories. See Figure 1 for disorder category descriptions. The disorder categories were then re-organized into eight broader categories for more concise presentation of results which are

described in Figure 2. Results for frequencies of the 21 original categories are first described and are summarized in Figure 3. The results presented below are general comparisons of the resulting frequencies and are not an analysis of statistical significance. Descriptions of these frequencies are included to help clarify patterns of disorder categories among participants in this study.

Among the 492 participants reporting CIDI data, 34.8% ($n = 171$) were not diagnosed with any disorders. The largest groups with a CIDI diagnoses fell into the SUD ($n=107$, 21.7%), and MuSUD ($n=48$, 9.8%) diagnostic categories. These findings are not unexpected considering that the ATTAIN program was designed for adolescents experimenting with drugs or alcohol and was not a treatment program for other types of behavioral or emotional problems.

Of those with a single diagnosis (E, I, SUD), SUD was most common ($n=107$, 21.7 %). However, a diagnosis of an externalizing disorder ($n=17$, 3.5%) was more common than both internalizing ($n=3$, 0.6%) and mixed ($n=3$, 0.6%) disorder categories. This result was also not unanticipated considering that many clients were referred from the juvenile justice system. Among participants with a single SUD diagnoses and at least one other psychiatric diagnosis, an externalizing disorder was most common to co-occur ($n=35$, 7.1% compared to $n=6$, 1.2% for SUDI and $n=1$, 0.2% for SUDM). This suggests that participants with externalizing disorders may be more likely to also have substance abuse problems.

When an externalizing disorder was present, there was almost an equal likelihood of assigning a single SUD ($n=35$, 7.1%) as of finding multiple SUDs ($n=32$, 6.5%) in this sample. However, there were more participants with multiple externalizing disorders

and multiple SUDs ($n=23$, 4.7%) than those with multiple externalizing and only one SUD ($n=7$, 1.4%). This suggests that the presence of multiple externalizing disorders is significantly related to the probability of also having a SUD.

Participants with a single internalizing diagnosis with a single SUD were more common than participants with a mixed diagnosis or a single SUD, however, having multiple mixed diagnoses with multiple SUDs was more common than participants assigned multiple mixed disorders with a single SUD or multiple internalizing disorders with multiple SUDs, but not more common than participants assigned with multiple externalizing disorders and multiple SUDs. This suggests that having multiple psychiatric disorders may increase the likelihood of also having multiple SUDs, more so than having any internalizing disorders.

Condensed categories demonstrate these differences more clearly. Descriptions of these categories are summarized in Figure 2 and frequencies are depicted in Figure 4. The largest case category was NO (no disorder, $n=171$, 34.8%), SUDO was the second largest group of cases ($n=155$, 31.5 %) and SUDEO ($n=97$, 19.7%) was the third. This suggests that among participants with comorbid substance use disorders and another psychiatric diagnosis, externalizing disorders more commonly co-occurred than did either internalizing or mixed. It is also important to note that externalizing disorders were more likely to co-occur with a substance use disorder rather than appearing as a single diagnosis in this sample. This suggests that the presence of an externalizing disorder may increase the chances of developing substance abuse problems or conversely, that having a substance abuse problem may increase the chances of developing an externalizing psychiatric disorder.

Research Question One: How is Treatment Entry and Completion Associated with Comorbid Disorders?

To answer this question, participants categorized into collapsed comorbid disorder groups were examined for differences in the proportions of participants who entered treatment. This was done utilizing a cross-tabulation to compare proportions and the results are presented in Table 2. Although participants categorized as SUDEO had the highest percentage of those who did not enter treatment ($n=30$, 31.9%), the differences in proportions across categories was not statistically significant; $\chi^2(7, n=458) = 8.579, p = 0.284$. This suggests that for participants in this sample, the presence of, or lack of comorbid disorders did not seem to influence entry into treatment. However, results may indicate a trend for those with comorbid substance use and externalizing disorders ($n=30$, 31.9%) and substance use disorders ($n=21$, 20.1%) to be less likely to enter into treatment. It is also interesting that 100% of participants diagnosed with mixed internalizing and externalizing disorders who were referred to treatment entered treatment. Although the results are not statistically significant because of small numbers of participants in several categories, it does suggest a possible trend for better treatment entry for those with mixed diagnoses.

Data were also analyzed utilizing a one-way ANOVA to determine if there was a significant difference among those in each comorbid disorder categories in the number of therapy sessions attended. Results summarized in Table 3 indicated no significant difference, $F(7,350) = 0.508, p=0.193$, which suggests that various patterns of comorbid disorders is not related systematically to the number of sessions that clients did attend. A one-way ANOVA was also used to analyze differences in how participants in different

comorbid disorder categories perceived their counselor. The results of this test showed no significant differences in how participants in each disorder category rated their counselor, except for ratings of their counselor's confidence, $F(7,278) = 3.24, p = 0.003$.

Participants in categories SUDEO ($M=6.57$) and MO ($M= 5.67$) rated their counselor's confidence the lowest and participants in categories SUDIO ($M= 7$) and IO ($M= 7$) rated their counselor's confidence the highest. There is no evidence that having specific disorder combinations influences participant's general satisfaction with their counselor; however, it may influence participant's perception of their counselor's level of confidence.

Research Question Two: Is Treatment Entry and Retention Associated with Severity of Client Alcohol Use?

Table 4 summarizes results of a correlation matrix for (a) the number of therapy sessions attended, (b) counselor ratings, and (c) TLFB variables. The analysis revealed no significant bivariate correlations among these variables. This suggests that participants' satisfaction with their counselor and the number of therapy sessions completed is not related to participants alcohol use patterns in the thirty days prior the baseline assessment.

Research Question Three: How are Different Patterns of Comorbid Disorders Associated with Alcohol Use Severity?

To help answer this question a one-way ANOVA was conducted for comorbid disorder category and TLFB variables. This analysis summarized in Table 5, showed significant group differences for average number of days abstinent, $F(7,455) = 2.05, p= .047$ and there was a trend towards significance for the average number of drinks per drinking day, $F(7,455) = 1.866, p= .073$, but no significant difference were found for

average drinks thirty days before baseline, $F(7,454) = 1.041, p = .402$, average maximum drinks per drinking day and $F(7,454) = 1.160, p = 0.325$. Participants categorized NO had the highest average number of days abstinent ($M = 29.06$) and participants categorized SUDIO had the lowest average number of days abstinent ($M = 27.36$). This suggests that diagnoses of particular comorbid disorder combinations are associated with the number of days one remains abstinent from alcohol and the maximum amount of drinks one drinks in a single day. Although there were no statistically significant differences between groups, participants in categories MO and SUDIO had the highest mean number of days used thirty days before the baseline. This suggests that participants with comorbid mixed internalizing and externalizing disorders and participants with comorbid substance use disorders and internalizing disorders may drink more frequently than those in other disorder categories.

Research Question Four: Are Diagnoses of Comorbid Disorders Associated with Significantly Greater Likelihood of Repeated Treatment Utilization?

This issue was addressed by using a one-way ANOVA to examine differences among participants who utilized various substance abuse treatment services by the number of comorbid disorders. The Involvement in Counseling Services measurement was given at each assessment and therefore, this was an analysis across all occasions assessed rather than simply by number of participants. Results of the analysis presented in Table 6 indicated no significant differences in number of diagnoses among groups by service use status which, suggests that participants diagnosed with more disorders did not utilize more treatment services across the period that they were involved with the study.

Research Question Five: Is Severity of Alcohol Use Associated with Greater Likelihood of Repeated Treatment Utilization?

This was assessed utilizing a one-way ANOVA for TLFB variables by whether specific counseling services were accessed. Results presented in Table 7 indicated significant differences among the TLFB variables of average number of days drinking 30 days before baseline and using self-help books, $F(1,461) = 3.69, p = .05$, average drinks per drinking day and using self-help books, $F(1,461) = 6.674, p = .01$ and average maximum drinks per drinking day and using self-help books, $F(1,461) = 3.79, p = .05$. The means for average number of days drinking, average drinks per drinking day, and average maximum number of drinks per day were higher than for those participants who used self-help books. This suggests that those who have read self help books about substance abuse may have more substance abuse problems than participants who did not read self-help books.

Chapter 5: Discussion

Summary of Results

This study evaluated relationships between (a) specific combinations of disorders and (b) alcohol use severity, treatment entry and treatment completion using correlations, ANOVA and cross-tabulations. These analyses described how treatment engagement and initial severity of alcohol use is associated with the presence of other Axis I disorders. In addition, clients with various comorbid diagnoses were compared on levels of treatment utilization. This study improves current understanding of how comorbidity is related to treatment entry, treatment completion, and alcohol use severity among adolescents referred to an outpatient substance abuse program.

The first hypothesis for this study was that participants diagnosed with disorders characterized by internalizing symptomatology would be more likely to enter into and complete treatment than those diagnosed with disorders characterized by externalizing symptomatology. However, if those with internalizing symptoms also have externalizing symptoms, then there would not be higher levels of treatment involvement. The results of this study showed that participants diagnosed with a substance use disorder and an externalizing disorder had the highest percentage of clients who did not enter treatment. Although the differences among comorbid disorder groups were not statistically significant, it does demonstrate a trend for those with comorbid substance use and externalizing disorders to be less likely to enter into treatment. This finding provides some initial support for the hypothesis that persons with disorders characterized by externalizing symptoms are more difficult to recruit into treatment, but does not suggest that participants with externalizing disorders will disengage prematurely from treatment.

Another finding that contrasts with the original hypothesis was that 100% of participants diagnosed with mixed disorders (internalizing and externalizing) who were referred to the program, entered treatment. Although the result was not significant because the sub-sample was not large, it does suggest a trend for better engagement for those with mixed diagnoses. This finding contradicts the hypothesis that a diagnosis of an externalizing disorder would counteract the “retention effect” of having an internalizing disorder.

Participants were also analyzed to determine if there was a significant difference among those in each comorbid disorder category with regard to the number of therapy sessions attended. Results indicated no significant difference, which suggests that having

various patterns of comorbid disorders do not influence the number of therapy sessions that one might attend. This does not support the hypothesis that having particular combinations of disorders or number of disorders influences attrition once the adolescent is already in treatment.

Participants' involvement in therapy was also assessed by examining participant's perceptions and level of satisfaction with their counselor. Participants generally rated their therapists highly on each dimension, demonstrating positive perceptions of their therapists. There were no significant differences among groups except for ratings of their counselor's confidence. There was no evidence that having particular combinations of disorders influences participant's general satisfaction with their counselor and their perceptions of their counselor did not seem to influence the number of sessions attended; however, it may influence participant's perceptions of their counselor's level of confidence

Hypothesis two was that those with more severe patterns of alcohol use would be more difficult to retain in treatment. This hypothesis was not supported by analyses that reached statistical significance. Results failed to reveal significant correlations between severity of substance use and treatment engagement. However, in looking at patterns of those diagnosed with substance use disorders, participants diagnosed with a substance use disorder, as well as another psychiatric diagnoses and in particular, externalizing disorders had higher percentages of adolescents who did not enter treatment in comparison to those who were diagnosed with psychiatric disorders and no SUD (see Table 2). Having a diagnosis of a SUD may be an indicator of more severe substance use,

and that severity of substance use may influence entry into treatment, but it may not influence engagement after beginning treatment.

Hypothesis number three stated that although there are contradictions in literature about whether disorders with externalizing or internalizing characteristics are related to more severe substance use, most literature suggests that multiple diagnoses are related to higher levels of substance use. It was expected that participants with multiple diagnoses would have more severe alcohol use problems compared to those with only a single or dual diagnoses. The results showed significant group differences for average number of days abstinent. Participants with no disorders had the highest average number of days abstinent and participants with a substance use disorder comorbid with an internalizing disorder had the lowest average number of days abstinent. There was also a trend towards significant differences between groups for the average number of drinks per drinking day, with participants categorized under NO and SUDMO reporting the lowest average number of drinks in a single drinking episode and participants categorized under MO and SUDIO had the highest average number of drinks in a single drinking episode. The finding that participants with no disorders had less severe substance use problems than did those with single or multiple diagnoses supports this hypothesis. However, the hypothesis might have been better supported if participants under the SUDMO category had the more severe substance use problems, since this category had the potential for the greatest number of disorders.

Hypothesis number four stated that participants with comorbid disorders would have utilized more treatment services. Results indicated no significant differences in number of diagnoses by service use status suggesting no association between the two

variable domains. This finding does not support the hypothesis that participants diagnosed with more disorders utilized more treatment services across the period that the participants were involved with the study.

Hypothesis number five stated that participants with more severe patterns of alcohol use would have utilized more substance abuse treatment services. Results indicated that there were significant associations between the (a) TLFB variables of average number of days drinking 30 days before baseline and the use of self-help books, (b) average drinks per drinking day and use the of self-help books, (c) and average maximum drinks per drinking day and the use self-help books. Participants who had read self-help books had more severe patterns of substance use than those who did not. There were no other significant differences in TLFB variables among groups by utilization of other treatment services such as detox, outpatient services, inpatient services, counseling, Alcoholics Anonymous or other services. This does not support the hypothesis that participants with more disorders utilized more treatment services. However, it does suggest that participants with more severe substance use problems are more likely to utilize self-help treatment.

Synthesis of Literature Review and Results

Research question one: association of treatment entry and completion with comorbid disorders. This study sought to assess how different combinations of disorders would influence treatment entry, treatment completion and satisfaction with counselor. Literature suggests that those diagnosed with internalizing disorders are more amenable to treatment, in contrast to those diagnosed with a disorder characterized by externalizing symptoms (Kaminer et al., 1992; Rivers et al., 2001 & Siqueland et al., 1998). Results of

this study did not support previous research. Participants with internalizing disorders were not significantly different in terms of proportion entering into treatment or attrition levels after entry into treatment. A possible explanation for this contradiction in findings is that the sample size of participants diagnosed with internalizing disorders was small. If there had been a larger sample of clients with internalizing disorders participating in this program, differences among groups may have been more robust and statistically significant. It is likely that there were fewer participants with internalizing disorders because many of the participants were referred from the juvenile justice system. Considering the manifestations of disorders characterized by externalizing symptomatology, it would not be unexpected to find a predominance of adolescents with these disorders involved in the juvenile justice system as in the Milin et al., (1993) article.

Literature also suggests that clients with externalizing behaviors or who are diagnosed with disorders characterized by externalizing symptoms are more difficult to recruit into and retain in treatment (Rivers et al., 2001 & Wise et al., 2001). The results of the current study demonstrated a trend for participants with comorbid substance use and externalizing disorders to be less likely to enter into treatment, but this does not suggest that participants with externalizing disorders will disengage prematurely from substance abuse treatment. Some studies have found that coerced clients began treatment sooner and remain in it longer than those who enter treatment voluntarily (Farabee, Shen, Hser, Grella, & Anglin, 2001). This could explain the findings in the current study since many participants were court mandated to complete a substance abuse treatment program. This external and potentially coercive force may have influenced clients' motivation for completing treatment once beginning. However, this does not explain the trend of those

with comorbid substance use and externalizing disorders to be less likely to enter treatment. Participants diagnosed with externalizing disorders may have a more general disregard towards authority or may be in denial about the severity of their substance use because of the characteristics of their symptoms, and therefore, are less likely to enter into treatment services (Powell, 2003).

Some literature suggests that among clients diagnosed with an internalizing disorder, as well as with an externalizing disorder, or who have externalizing symptoms, the presence of the externalizing symptoms counteracts the potential improvement in treatment retention (Dierker et al., 2001). The current study contrasted with previous research. Although findings were not statistically significant, it was found that 100% of participants with mixed disorders entered into treatment and 84% of participants with substance use disorders and mixed disorders entered into treatment. Participants with internalizing symptoms had lower percentages of treatment entry (IO = 80% & SUDIO = 75%). A possible explanation for this finding could be that adolescents with greater psychiatric problems may recognize the need for help or as mentioned previously, because of involvement in the juvenile justice system, they may have greater external motivation to enter into treatment.

Participants in this study overall, rated their therapists positively and there were no significant differences in how participants perceived their counselors, except for on ratings of confidence. Participants under the MO and SUDEO disorder categories rated their therapists lower in confidence, whereas participants categorized under the IO and SUDIO groups rated their counselors the highest with regard to therapist confidence. This suggests that specific disorders may influence participant's perception of their

counselor's levels of confidence. Persons with disorders characterized by externalizing symptoms may rate their therapist's confidence level lower because of a tendency to question authority. Adolescents with disorders such as conduct disorder or oppositional defiant disorder, because of the nature of their symptoms, may be more intimidating to their therapist and as a result incite a different reaction than therapists have with clients with internalizing symptoms who are likely be more compliant with or receptive to interventions.

Research question two: association of treatment entry and retention with severity of client alcohol use. Research has documented that more severe use of alcohol and drugs contributes to higher attrition rates in treatment programs (Beckman & Bardsley, 1986; Leigh et al., 1994; Moos & Bliss, 1978). The current study did not support existing literature with regard to this finding. Analysis revealed no significant correlations among the number of therapy sessions completed, counselor ratings and levels of substance use. A possible explanation for this finding is that participants in this program were in the initial stages of substance use problems and were not using substances severely enough to have the same impact on retention as found in other studies of older clients with more severe patterns of substance use (Anglin, 1997; Beckman & Bardsle, 1986; Leigh et al., 1994; Moos & Bliss, 1978). As mentioned earlier, it is also possible that because adolescents in this study were referred from the juvenile justice system, and were often mandated to complete a drug treatment program, this may have influenced their motivation to continue with services and superseded a common tendency to be less engaged because of the symptoms of their disorder.

Another possible explanation for differences in findings of this study in comparison to other studies regarding treatment retention and attrition is that the ATTAIn program utilized a unique approach to substance abuse treatment. Many traditional substance abuse treatment programs adhere to the twelve step programs originally developed for adults, which demand abstinence and the treatment process is generally longer in duration. The ATTAIn program, however, utilizes a more succinct and less strict approach of a brief motivational intervention (i.e. Guided Self Change). Participants were to attend five therapy sessions focusing on setting personal goals for reducing substance use over the course of treatment. This approach seems more conducive to an adolescent population considering their developmental stage of desiring more autonomy. Also, participants diagnosed with externalizing disorders may be less resistant to treatment when there they are allowed to set their own goals. Those with externalizing disorders may be more likely to oppose or defy a set rule or standard, but since participants set their own goals, there is little to defy against. The Guided Self Change approach allows for the client to have more control in the therapeutic process, which may be more appealing than other treatment approaches, which take more time and have a more stringent approach. Considering that the participants in the study were adolescents and many were diagnosed with externalizing disorders, the low attrition rates found in the current study may be a result of the brevity of treatment and the intervention approach in the ATTAIn program.

Research question three: association of patterns of comorbid disorders with alcohol use severity. Research is mixed about how disorders characterized by internalizing symptoms or externalizing symptoms influences participants' substance use

severity. In support of studies by Swandi and Bobier (2003) and Henry et al. (1993), the current study suggests that adolescents diagnosed with internalizing disorders have more severe patterns of substance use. Adolescents who feel depressed or anxious likely have poor coping skills and they may use alcohol as an escape from depressed feelings or to relieve symptoms of anxiety. In contrast, adolescents diagnosed with externalizing disorders may drink as a form of rebellion, for acceptance by peers or for thrill seeking. The more severe patterns of substance use seen among adolescents with disorders characterized by internalizing symptoms may stem from an attempt to self-medicate and reflect greater feelings of need for substances, which may make it more difficult for these adolescents to remain abstinent as they drink more in order to relieve the symptoms of their disorder.

When looking at the frequency data for patterns of comorbid disorders (see Figure 4) SUDs with externalizing disorders more commonly co-occurred than SUDs with internalizing or mixed disorders, suggesting that a diagnosis of an externalizing disorder may increase the chances of developing substance use problems, or conversely, that having a substance abuse problem may increase the chances of developing an externalizing psychiatric disorder. These findings would support the findings by the Milin et al. (1991) study that adolescents diagnosed with externalizing disorders often have co-occurring SUDs, but the frequency data does not support the literature which suggests that a diagnoses of mixed externalizing and internalizing disorders or internalizing disorders alone increase substance use severity (King et al., 1996; Swandi & Bobier, 2003). However, it is also likely that the frequency of this comorbid disorder pattern in the current study was a result of drawing a sample from adolescents involved in the

juvenile justice system. It would not be unexpected to find that many adolescents who have had problems with the law would also be more likely to be diagnosed with disorders characterized by externalizing symptoms. The findings from the current study seem to support more strongly the literature that suggests that clients diagnosed with internalizing disorders are likely to have more severe substance use problems (Henry et al., 1993; Swandi & Bobier, 2003) than other research that suggests that clients with externalizing disorders have more severe patterns of substance use problems.

Research question four: associations of comorbid disorders with repeated treatment utilization. In contrast to the study by Grella et al. (2001), the results of the present study indicated no significant differences in number of diagnoses among groups by service use status, which suggests that participants diagnosed with more disorders, did not utilize more treatment services. Although it appears there are large differences between groups, the groups were potentially not large enough to generate enough statistical power to detect significant group differences. Another possible explanation for the discrepancy between this study and other research is that adolescents who entered into ATTAIN outpatient treatment may have been better functioning and had less severe substance use problems than those who were referred and never attended the program. Adolescents who participated in this program were also in the initial stages of substance use problems and therefore may not have felt the need to access other treatment services.

In addition, adolescents who have a greater need for services may be less likely to access them because of less supportive or concerned parents, low SES which may make it more difficult to access reliable transportation or because of Hispanic cultural beliefs. The population in the current study was predominately Hispanic which was identified as

a factor that contributed to attrition in a study by White et al., (1998). Families of Hispanic/Latino ethnicity may be less likely to seek services because of a cultural value of family independence and self-reliance and more liberal views about alcohol consumption. As a result, those adolescents exhibiting more severe patterns of substance use may not have been encouraged to enter into treatment. Machismo may also foster the denial of substance abuse problems for fear of being perceived as weak (Rothe, 2004). People of Hispanic/Latino ethnicity are also significantly less informed about the negative effects of alcohol, tobacco, and drug abuse than other ethnic groups (Ruiz & Langrod, 1997), which could contribute to reluctance to enter into treatment.

Research question five: association of severity of substance use with repeated treatment utilization? Substance use severity was significantly related to the utilization of self-help books, but it was not significantly related to use of other forms of substance use treatment services. Results showed that the means for most of the TLFB variables were higher for participants who used self-help books. This suggests those who have read self-help books about substance abuse may have more substance abuse problems than participants who did not read self-help books. Anglin (1997) found that severity of substance use was identified as a precursor of earlier substance abuse treatment initiation and utilization. It is possible that adolescents with more severe substance use problems may recognize that their substance use is becoming a problem and as a result, seek out information about how to cope more effectively with their substance use problems, but because many of the participants in the program were generally in the early stages of substance use problems, they may not yet have felt the need to access other treatment services.

Implications for Prevention and Treatment

This study demonstrated a trend for those with comorbid substance use and externalizing disorders to be less likely to enter into treatment, but it did not suggest that participants with externalizing disorders will disengage prematurely from treatment. Treatment programs may want to focus more attention and effort in encouraging clients to participate after being referred. Such strategies may include more frequent phone contact or home visits to help build rapport and comfort even before entering into treatment services. In addition, when working with Hispanic and Latino adolescents, it may be important to consider their cultural values and beliefs in the process of recruiting. Treatment programs may also need to spend more time informing the Hispanic clients and their families about the negative impact substance use may have on individual and family functioning because they are not as educated about the negative effects of substance use (Rothe, 2004). Incorporating more family involvement to reduce resistance may be important early on in the recruitment process and throughout treatment because of the desire to address problems independently within the family unit (Ruiz & Langrod, 1997).

The current study suggests that adolescents diagnosed with internalizing disorders have more severe patterns of substance use. This finding merits further research of treatment outcomes for clients diagnosed with internalizing disorders. Since studies have found that more severe patterns of substance use are related to poorer treatment outcomes (e.g. Anglin, 1997) treatment programs that incorporate treatment interventions that focus on treating both the substance use problem as well as the symptoms of psychiatric disorder may find improved treatment outcomes. This may be even more important for

clients diagnosed with disorders characterized by internalizing symptoms who might use more severely because of the symptoms of their disorder. Those diagnosed with disorders such as anxiety or depression may require help to learn other ways to cope with their symptoms other than using substances to alleviate their unpleasant feelings. Substance abuse treatment programs might better serve these clients if more attention were focused on teaching coping strategies or even incorporating medication management as a treatment modality for clients with more severe internalizing symptoms, which could reduce their desire to self-medicate by using illegal drugs or alcohol.

Limitations

This study is limited by the sample of participants being predominantly male, Hispanic adolescents who were referred to treatment by the juvenile justice system for substance abuse problems. The findings in the present study cannot be generalized easily to other adolescent populations. This is an important issue to consider because this population may be unique and inherently different from other adolescent populations. Literature also suggests that there may be gender differences in how particular combinations of disorders influence treatment engagement and substance use severity (Blood & Cornwall, 1994; Wise et al., 2001) but this could not be explored further in the present study because of the small number of females who participated in the study. However, this study does add to current understanding about the influence of comorbidity on treatment engagement and severity of substance use for this particular population of adolescents.

The current study is also limited by the use self-report measures, such as the CIDI and TLFB. For example, in one study by Villasenor and Waitzkin (1999) some

limitations of the CIDI included: inaccurate identification of somatoform symptoms, cultural syndromes that were not recognized by this measurement tool, and language differences between the patients and physicians that reduced accuracy of diagnoses. Although structured instruments make for faster and easier assessment, it also forces a range of complex experiences into a fixed-choice interview format that may result in less accurate psychiatric diagnoses. The TLFB measure is also limited by self-report because it relies on participant's memory, which may reduce accuracy. In addition, adolescents may minimize or exaggerate the severity of their substance use in order to maintain an image that they wish to portray about themselves.

Another limitation is that the present study only investigated how various combinations of comorbid disorders and substance use severity were related to treatment entry and completion as well as how patterns of comorbid disorders were associated with alcohol use severity. Although additional research is needed to improve understanding about these relations, psychiatric diagnoses and severity of alcohol use are not the only factors that influence treatment attrition and retention. Other factors that could be investigated might include: family functioning and support, family history of substance use, peer affiliations, ethnicity, perceived prejudice or discrimination, acculturation, sources of motivation, parental and sibling problem recognition, and other practical obstacles to treatment such as socio economic status.

Another limitation to consider when reviewing this study is that although adolescents were randomly assigned to different treatment conditions (i.e., waitlist, individual-format, family-format, and choice), treatment condition was not assessed as a factor in any of the analysis performed. It was not included because the focus of the

present study was on how adolescents in various comorbid categories differ in terms of treatment entry and completion and not on how therapy conditions influence entry and completion, however, treatment condition may have been another factor related to these variables. Adolescents who had a choice about their treatment condition may have improved their perception of involvement and control in the treatment process and may have been more vested in attending treatment as a result. Considering that many participants were of Hispanic/Latino ethnicity, involvement of the family may have also contributed to improved treatment entry and retention.

Directions for Future Research

Future research may want to further explore how relations between comorbid disorders and (a) treatment entry, treatment completion and (b) severity of substance use in a more diverse sample to better understand how other populations interact in treatment depending on patterns of comorbid disorders. Utilization of more comprehensive, non-self report measures to diagnose disorders may help illuminate more precisely how patterns of comorbidity influences treatment involvement and alcohol use severity.

The present study helped document that participants with internalizing and substance use disorders have more severe patterns of alcohol use in this sample. Future research may want to explore reasons why clients with these comorbid diagnoses are likely to use alcohol more severely by focusing on identifying clients' environments, situations, thoughts and feelings around incidents of drinking to help clarify triggers to substance use for this population of adolescents. Having further understanding about the reasons that this population may use more severely would make it easier for substance abuse treatment programs to tailor interventions to specifically address client's special needs.

Future studies focusing on attrition and retention in substance abuse treatment programs and severity of substance use may want to explore other factors that could influence these variables, other than patterns of comorbid disorders, such as, family functioning and support, family history of substance use, peer affiliations, ethnicity, perceived prejudice or discrimination, acculturation, sources of motivation, parental and sibling problem recognition, and other practical obstacles to treatment such as socio-economic status.

Another important factor that was not explored in the present study was direction of influence for alcohol use severity and comorbid disorders. The question of whether substance use precedes or follows the diagnoses of psychiatric disorders is not fully explored or understood. Having improved understanding of this relation could have significant implications for treatment programs. For example, a study by Kessler et al. (1996) found that people who accessed both substance abuse treatment as well as psychiatric treatment, most had accessed mental health services before entering into a substance abuse treatment program. This suggests that psychiatric disorders may precede substance use, but further research is required to better understand the direction of influence. If future research is able to establish that specific psychiatric disorders influence initiation of substance use, then treatment for these disorders could also include substance use prevention interventions.

Table 1

Sample Characteristics

	<i>n</i>	%
Ethnicity		
White non-Hispanic	41	7.8 %
Hispanic White	360	75.8 %
Hispanic Black	25	4.7%
African American	79	14.9%
Other	24	4.5%
Gender		
Male	475	89%
Female	54	10%
Completed one or more therapy sessions		
Yes	411	43%
Completed intake only		
Yes	43	9.5%

Table 2

Cross-tabulation of disorder category and treatment entry

Disorder Category	Yes		No		χ^2	p
	<i>n</i>	%	<i>n</i>	%		
EO	18	81.8%	4	18.2%	8.579	.284
IO	4	80%	1	20%		
MO	5	100%	0	0%		
NO	127	80.9%	30	19.1%		
SUDEO	64	68.1%	30	31.9%		
SUDIO	9	75%	3	25%		
SUDMO	16	84.2%	3	15.8%		
SUDO	115	79.9%	29	20.1%		

Note: $\chi^2 (7, n = 458) = 8.579$, NS

Table 3

ANOVA of Therapy sessions completed and counselor ratings by disorder category

---

	<u>M</u>	<u>EO</u> <u>SD</u>	<u>N</u>	<u>M</u>	<u>IO</u> <u>SD</u>	<u>N</u>	<u>M</u>	<u>MO</u> <u>SD</u>	<u>N</u>
# of sessions completed	4.44	1.42	18	4.25	1.50	4	4.40	1.14	5
Counselor Ratings									
Friendly	6.73	0.90	11	6.25	6.25	4	7.00	0.00	3
Firm	6.18	1.53	11	4.50	1.00	4	6.67	0.57	3
Caring	6.64	0.92	11	6.25	0.50	4	7.00	0.00	3
Accepting	6.82	0.40	11	6.50	0.57	4	7.00	0.00	3
Straight-Forward	6.82	0.40	11	6.25	0.95	4	6.67	0.57	3
Expert	6.73	0.64	11	6.00	0.81	4	5.67	1.52	3
Sensitive	5.91	1.86	11	5.75	0.95	4	5.33	2.88	3
Competent	6.82	0.40	11	6.25	0.05	4	5.33	2.08	3
Knowledgeable	6.91	0.30	11	6.00	0.81	4	5.67	1.52	3
Supportive	6.82	0.40	11	7.00	0.00	4	6.00	1.73	3
Confident	6.82	0.40	11	7.00	0.00	4	5.67	1.52	3
Understanding	6.91	0.30	11	6.50	0.57	4	6.00	7.73	3

Table 3 continued

ANOVA of Therapy sessions completed and counselor ratings by disorder category

	NO			SUDEO			SUDIO		
	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>
# of sessions completed	4.57	1.34	127	4.67	1.29	64	5.33	0.70	9
Counselor Ratings									
Friendly	6.88	0.44	108	6.76	0.61	51	7	0.00	7
Firm	5.53	2.05	108	5.33	2.04	51	5.86	1.46	7
Caring	6.75	0.64	108	6.69	0.76	51	7.00	0.00	7
Accepting	6.70	0.81	108	6.71	0.67	51	7.00	0.00	7
Straight-Forward	6.69	0.74	108	6.69	0.70	51	6.86	0.37	7
Expert	6.65	0.87	108	6.49	0.92	51	7.00	0.00	7
Sensitive	6.20	1.40	108	6.25	1.18	51	6.71	0.48	7
Competent	6.67	0.77	108	6.55	0.87	51	6.14	2.26	7
Knowledgeable	6.72	0.68	108	6.67	1.90	51	6.71	0.48	7
Supportive	6.68	0.50	108	6.69	0.67	51	6.86	0.37	7
Confident	6.83	0.50	108	6.57	0.78	51	7.00	0.00	7
Understanding	6.82	0.59	108	6.71	0.67	51	7.00	0.00	7

Table 3 continued

ANOVA of Therapy sessions completed and counselor ratings by disorder category

	SUDMO			SUDO			df	F
	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>		
# of sessions completed	4.63	1.89	16	4.69	1.41	115	7	.508
Counselor Ratings								
Friendly	7.00	0.00	12	6.87	0.50	90	7	1.431
Firm	5.17	2.36	12	5.88	1.75	90	7	.985
Caring	6.75	0.17	12	6.80	0.54	90	7	.771
Accepting	6.67	0.88	12	6.82	0.46	90	7	.581
Straight-Forward	6.92	0.28	12	6.82	0.61	90	7	.798
Expert	6.75	0.45	12	6.69	0.61	90	7	1.607
Sensitive	6.17	1.52	12	6.47	1.08	90	7	.901
Competent	6.58	0.90	12	6.70	0.74	90	7	1.691
Knowledgeable	6.75	0.45	12	6.79	0.48	90	7	2.056
Supportive	6.83	0.38	12	6.88	0.44	90	7	1.812
Confident	6.67	0.65	12	6.83	0.48	90	7	3.235**
Understanding	6.67	0.88	12	6.87	0.07	90	7	1.249

* $p < .05$, ** $p < .01$

Correlation matrix of number of therapy sessions completed and counselor ratings by TLFB variables.

* $p < .05$

Table 5
ANOVA of TLFB variables by comorbid disorder category

	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>
Ave # of days drinking 30 days before baseline	1.44	2.43	26	2.03	2.38	5	2.40	3.04	5
Ave max drinks per drinking day	2.35	6.04	26	3.20	4.14	5	4.20	6.38	5
Ave drinks per drinking day	0.27	0.73	26	0.17	0.23	5	0.38	0.70	5
Ave days abstinent	27.65	6.25	26	28.60	1.34	5	28.00	2.91	5

Table 5 continued

ANOVA of TLFB variables by disorder category

	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>	<u>M</u>	<u>SD</u>	<u>N</u>
Ave # of days drinking 30 days before baseline	1.60	2.35	2.65	2.35	3.33	89	2.65	2.48	11
Ave max drinks per drinking day	1.91	2.95	3.09	2.95	4.59	89	3.09	3.11	11
Ave drinks per drinking day	0.11	0.17	0.36	0.17	0.29	89	0.36	0.80	11
Ave days abstinent	29.06	28.82	27.36	28.82	1.54	89	27.36	3.52	11

Table 5 continued

ANOVA of TLFB variables by disorder category

	SUDMO		SUDO		N	df	F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>N</u>		<u>F</u>
Ave # of days drinking 30 days before baseline	1.07	1.79	1.87	2.93	147	7	1.041
Ave max drinks per drinking day	1.13	1.87	2.25	3.56	147	7	1.160
Ave drinks per drinking day	0.05	0.09	0.16	0.32	147	7	1.866
Ave days abstinent	29.37	0.89	28.83	0.16	147	7	2.025*

* $p < .05$,

Table 6

ANOVA of number of disorders by therapeutic services accessed

	Yes		No		N	df	F
	M	SD	M	SD			
Self help	1.50	1.92	1.52	1.75	427	1	.008
Detox	2.16	2.31	1.51	1.76	486	1	.790
Outpatient	2.09	2.18	1.50	1.75	471	1	2.259
Inpatient	1.53	1.26	1.52	1.78	479	1	.001
Counseling	1.39	1.60	1.54	1.80	430	1	.384
A.A.	2.08	2.31	1.51	1.76	480	1	1.212
Other	1.47	1.59	1.56	1.80	432	1	.086

* $p < .05$

Table 7

ANOVA of TLFB variables by number of therapeutic services accessed

	Self help books					Detox				
	Yes		No		F	Yes		No		F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Ave # of days drinking 30 days before baseline	3.25	12.61	1.86	2.81	1	3.69*	0.83	2.06	5.33	1
Ave drinks per drinking day	1.76	12.55	0.15	0.34	1	6.67**	0.04	0.37	4.63	1
Ave max drinks per drinking day	3.84	12.91	2.28	3.76	1	3.79*	0.83	2.51	5.91	1
Ave days abstinent	29.83	9.17	28.83	2.32	1	3.36	29.33	28.96	4.03	1
							0.81			

ANOVA of TLFB variables by number of prior services accessed

61

Table 7 continued

ANOVA of TLFB variables by number of prior services accessed

	Counseling				df	Alcoholics Anonymous				df	F	
	Yes		No			Yes		No				
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		F	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		<u>F</u>
Ave drinks 30 days before baseline	1.29	1.78	2.16	5.63	1	1.391	0.83	1.02	2.08	5.36	1	.650
Ave drinks per drinking day	0.13	0.31	0.40	4.93	1	.174	0.02	0.03	0.38	4.66	1	.068
Ave max drinks per drinking day	1.53	2.49	2.63	6.21	1	1.801	0.83	1.03	2.53	5.95	1	.975
Ave days abstinent	28.73	2.68	29.00	4.17	1	.231	29.50	0.52	28.95	4.05	1	.217

Table 7 continued

ANOVA of TLFB variables by number of prior services accessed

	Yes		Other No		df	F
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>		
Ave drinks 30 days before baseline	2.41	3.65	1.78	2.69	1	1.982
Ave drinks per drinking day	0.18	0.30	0.15	0.35	1	.267
Ave max drinks per drinking day	2.70	4.05	2.23	3.77	1	.617
Ave days abstinent	28.25	4.58	28.88	1.96	1	2.849

* $p < .05$, ** $p < .01$

Figure Captions

Figure 1. Key for disorder categories

Figure 2. Key for combined Disorder Categories

Figure 3. Frequency of various disorders and comorbid disorders

Figure 4. Frequency of combined disorder categories

Figure 1

Key for disorder categories

N =	None
SUD =	One substance use disorder
E =	One externalizing Disorder
I =	One internalizing Disorder
M =	Mixed Disorders (one internalizing & one externalizing)
MuE =	Multiple externalizing disorders
MuI =	Multiple internalizing disorders
MuM =	Multiple mixed disorders
SUDE =	One substance use disorder & one externalizing disorder
SUDI =	One substance use disorder & one internalizing disorder
SUDM =	One substance use disorder and mixed disorders (one internalizing & one externalizing)
MuSUD =	Multiple substance use disorders
MuSUDE =	Multiple substance use disorders and one externalizing disorder
MuSUDI =	Multiple substance use disorders and one internalizing disorder
MuSUDM =	Multiple substance use disorders and mixed disorders (one internalizing and one externalizing)
MuSUDMuE =	Multiple substance use disorders and multiple externalizing disorders
MuSUDMuI =	Multiple substance use disorders and multiple internalizing disorders
MuSUDMuM =	Multiple substance use disorders and multiple mixed disorders.
SUDMuE =	One substance use disorder and multiple externalizing disorders
SUDMuI =	One substance use disorder and multiple internalizing disorders
SUDMuM =	One substance use disorder and multiple mixed disorders

Figure 2

Key for combined disorder categories

EO =	Externalizing only
IO =	Internalizing only
MO =	Mixed only
NO =	None
SUDEO =	Substance Use Disorder and Externalizing only
SUDIO =	Substance Use Disorder and Internalizing only
SUDMO =	Substance Use Disorder and Mixed only
SUDO =	Substance Use Disorder only

Figure 3

Frequency of various disorders and comorbid disorders

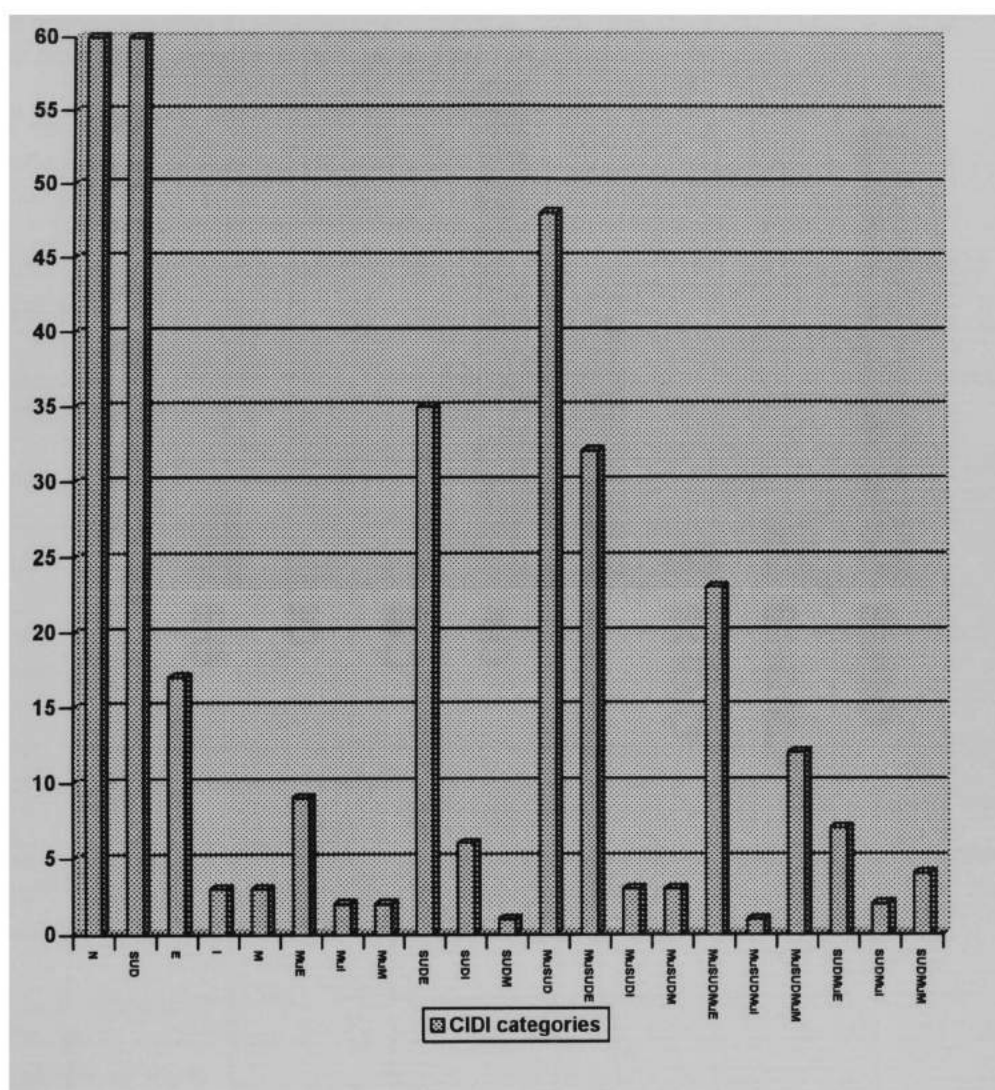
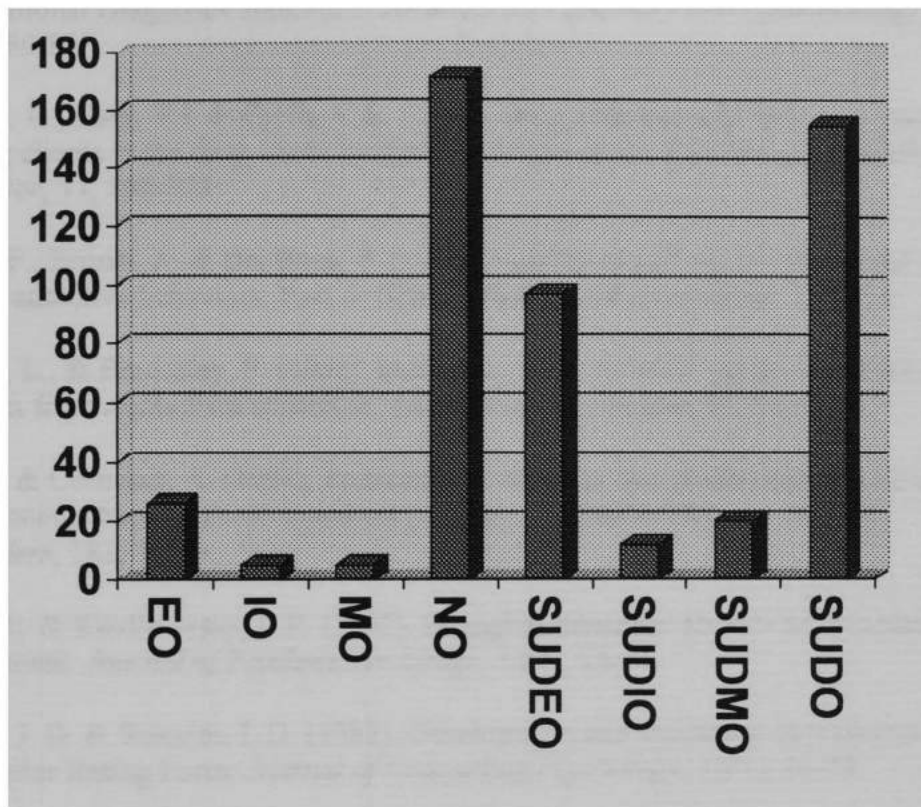


Figure 4

Frequency of combined disorder categories



References

- Andrews, G., Peters, L. (1998). The psychometric properties of the Composite International Diagnostic Interview. *Sociological Psychiatry and Epidemiology*, 33(2):80-89.
- Anglin M. D., Hser, Y.I. & Grella, C.E. (1997). Drug addiction and treatment careers among clients in the drug abuse treatment outcome study. *Psychological Addictive Behavior*, 11, 308-323.
- Babor, T.F., Brown, J., & Del Boca, F. (1990). Validity of self-reports in applied research across addictive behaviors: Fact or fiction? *Behavioral Assessment*, 12, 5-31.
- Beckman, L., & Bardseley, P. (1986). Individual characteristics, gender differences, and dropout from alcoholism treatment. *Alcohol and Alcoholism*, 21, 213-224.
- Blood, L. & Cornwall, A. (1994). Pretreatment variables that predict completion of an adolescent substance abuse treatment program. *Journal of Nervous Mental Disorders*, 182, 14-19.
- Claus, R.E. & Kindleberger, L.R. (2002). Engaging substance abusers after centralized assessment. *Journal of Psychoactive Drugs*, 34(1), 25-31.
- Corrigan, J. D. & Schmidt, L.D. (1983). Development and validation of revisions in the Counselor Rating Form. *Journal of Counseling Psychology*, 30(1), 64-75.
- Crowley, J., Mikulick, K. MacDonald, M., Young, E. & Zerbe, O. (1998). Substance dependent, conduct-disordered adolescent males: Severity of diagnosis predicts 2-year outcome. *Drug and Alcohol Dependence*, 49, 225-237.
- Crowley, J. MacDonald, M.J., Whitmore, E.A. & Mikulich, S.K. (1998). Cannabis dependence, withdrawal, and reinforcing effects among adolescent with conduct symptoms and substance use disorders. *Drug and Alcohol Dependence*, 50(1), 27-37.
- Dierker, L., Nargiso, J., Wiseman, R. & Hoff, D. (2001). Factors predicting attrition within a community initiated system of care. *Journal of Child and Family Studies*, 10(3), 367-383.
- Disney, E.R., Elkins, I.J., McGue, M., & Lacono, W.G. (1999). Effects of ADHD, conduct disorder and gender on substance use and abuse in adolescence. *American Journal of Psychiatry*, 156, 1515-1521.
- Doyle, A., Biederman, J., Monuteaux, M., Cohan, S., Schofield, H., Faraone, S. (2003) Diagnostic threshold for conduct disorder in girls and boys. *Journal of Nervous & Mental Disease*, 191(6), 379-386.

- Friedman, A.S. & Glickman N.W. (1986). Program characteristics for successful treatment of adolescent drug abuse. *Journal of Nervous mental Disease*, 174, 669-679.
- Farabee, D., Shen, H., Hser, Y.I., Grella, C.E., and Anglin, M.D. (2001). The effect of drug treatment on criminal behavior among adolescents in DATOS-A. *Journal of Adolescent Research*, 16(6), 679-696.
- Greenbaum, P.E., Prange, M.E., Friedman, R.M. & Silver, S.E. (1991). Substance abuse prevalence and comorbidity with other psychiatric disorders among adolescents with severe emotional disturbances. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 575-583.
- Greenbaum, P.E., Foster-Johnson, L. & Petrila, A. (1996). Co-occurring addictive and mental disorders among adolescents: Prevalence research and future directions. *American Journal of Orthopsychiatry*, 66, 52-60.
- Grella, C. E., Hser, Y., Joshi, V., Rounds-Bryant, J. (2001). Drug treatment outcomes for adolescents with comorbid mental and substance use disorders. *Journal of Nervous and Mental Disease*, 189(6), 384-392.
- Henry, B., Feehan, M., McGee, R. Stanton, W., Moffit, T.E., & Silva, P. (1993). The importance of conduct problems and depressive symptoms in predicting adolescent substance use. *Journal of Abnormal Child Psychology*, 21, 469-480.
- Kaminer, Y., Tarter, R.E., Bukstein, O.G., & Kabene, M. (1992). Comparison between treatment completers and non-completers among dually diagnosed substance-abusing adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*, 31, 1046-1049.
- Kennedy, B., Minami, M. (1993). The Beech Hill Hospital/outward bound adolescent chemical dependency treatment program. *Journal of substance abuse treatment*, 10, 395-406.
- Kessler, R.C, McGonagle, K.A., Zhao, S., Nelson, C.B., Hughes, M., Eshleman, S., Wittchen, H.U., & Kendler, K.S. (1994). Lifetime and 12 month prevalence of DSM III-R psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry*, 51, 8-9.
- Kessler, R.C., Nelson, C.B., McGonagle, K.A., et al. (1996) Epidemiology of co-occurring addictive and mental disorder: Implications for prevention and service utilization. *American Journal of Orthopsychiatry*, 66, 17-31.
- King, C., Ghaziuddin, N., McGovern, L., Brand, E., Hill, E., & Naylor, M. (1996). Predictors of comorbid alcohol and substance abuse in depressed adolescents. *Journal of the American Academy of child and Adolescent Psychiatry*, 35, 743-751.

- Leigh, G., Ogborne, A.C., & Cleland, P. (1994). Factors associated with patient drop out from outpatient alcoholism treatment services. *Journal of Studies on Alcohol*, 45, 359-362.
- Milin, R., Halikas, J.A., Meller, J.E. & Morse, C. (1991). Psychopathology among substance abusing juvenile offenders. *Journal of the American Academy of Child and Adolescent Psychiatry*, 30, 569-574.
- Miller-Johnson, S., Lochman, J., Coie, J.D., Terry, R. & Hyman, C. (1998). Comorbidity of conduct and depressive problems at sixth grade: substance use outcomes across adolescence. *Journal of Abnormal Child Psychology*, 26(3), 221-232.
- Moos, R. & Bliss, F. (1978). Difficulty of follow-up and outcome of alcoholism treatment, *Journal of Studies on Alcohol*, 39, 473-90.
- Powell, K. M. (2003) Avoidance of responsibility in conduct disordered adolescents. *Dissertation Abstracts International: Section B: The Sciences & Engineering*, 63(11 B), 5503.
- Rivers, S. T., Greenbaum, R. L. & Goldberg, E. (2001). Hospital-based adolescent substance abuse treatment: Comorbidity, outcomes and gender. *The Journal of Nervous and Mental Disease*, 189(4), 229-237.
- Rothe, E. M. (2004). Fourteen Hispanic adolescents and their families: Sociocultural factors and treatment considerations. *Adolescent Psychiatry*. Retrieved March 5, 2005, from Find Articles database. Web site: http://www.findarticles.com/p/articles/mi_qa3882/is_200401/ai_n9383796/pg_1
- Ruiz P. & Langrod, J.G. (1997) Hispanic Americans in Lowinson JH, Ruiz P, Millman RB, Langrod JG. (eds) *Substance Abuse. A Comprehensive Textbook. Third Edition* Baltimore: Williams and Wilkins.
- Shrier, L.A., Harris, S.K., Kurland, M., & Knight, J.R. (2003). Substance use problems and associated psychiatric symptoms among adolescents in primary care. *Pediatrics*, 111(6), 699-705.
- Siqueland, L., Crits-Christoph, P., Frank, A., Daley, D., Weiss, R., Chittams, J., Blaine, J. & Luborsky L. (1998). Predictors of dropout from psychosocial treatment for cocaine dependence. *Drug and Alcohol Dependence*, 52, 1-13.
- Sobell, L.C., Sobell, M.B. (1992) Timeline follow-back: a technique for assessing self reported alcohol consumption. In: Litten, R.Z., Allen, J.P. (eds.) *Measuring alcohol consumption: Psychosocial and Biochemical Methods*. Totowa: Human Press, 41-72.

- Sobell, L.C., Maisto, S.A., Sobell, M.B. & Cooper, A.M. (1979) Reliability of alcohol abusers' self-reports of drinking behavior. *Behavior Research and Therapy*, 17, 157-160.
- Sobell, L.C., & Sobell, M.B. (1995) *Alcohol Timeline Followback Users' Manual*. Toronto: Addiction Research Foundation.
- Sobell, M.B., Sobell, L.C., Klajner, F., Pavan, D., & Basian, E. (1986). The reliability of a timeline method for assessing normal drinker college students' recent drinking history. *Utility for alcohol research: Addictive Behaviors*, 11, 149-161.
- Stark, M. J. (1992). Dropping out of substance abuse treatment: A clinically oriented review. *Clinical Psychology Review*, 12, 93-116.
- Swandi, H. & Bobier, C. (2003). Substance use disorder comorbidity among inpatient youths with psychiatric disorders. *Australian and New Zealand Journal of Psychiatry*, 37(3), 294.
- The National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Addictions (1992). The Economic Costs of Alcohol and Drug Abuse in the U.S.
- White, J.M., W. (1998). Predictors of attrition from an outpatient chemical dependency program. *Substance Abuse*, 19(2), 49-59.
- Villasenor, Y., Waitzkin, H., (1999). Limitations of a structured psychiatric diagnostic instrument in assessing somatization among Latino patients in primary care. *Med Care*, 37(7), 637-46.
- Williams R.J., Chang, S.Y., ACARG (2000) A comprehensive and comparative review of adolescent substance abuse treatment outcome. Clinical Psychology Scientific Practice. *Clinical Psychology: Science and Practice*, 7(2).
- Windle, M., & Windle, R.C. (1993). The continuity of behavioral expression among disinhibited and inhibited childhood subtypes. *Clinical Psychology Review*, 13, 741-761.
- Windle, M. (1996). An alcohol involvement typology for adolescents: Convergent validity and longitudinal stability. *Journal of studies on Alcohol*, 57, 627-637.
- Wise, B.K., Cuffe, S.P., Fischer, T., (2001). Dual diagnosis and successful participation of adolescents in substance abuse treatment. *Journal of Substance Abuse Treatment*, 21, 161-165.
- Wittchen, H.U. (1994). Reliability and validity studies of the WHO Composite International Diagnostic Interview (CIDI): A critical review. *Journal of Psychiatric Research*, 28, 57-84.