

ORIGINAL ARTICLE

An exploratory investigation of co-occurring substance-related and psychiatric disorders

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Abstract

This exploratory, quantitative study investigated the prevalence rate of patients with co-occurring substance-related and psychiatric disorders (CODs) at a private rehabilitation centre in Johannesburg, South Africa. Details of the case histories of the clients were collected, coded and analysed using Statistical Analysis System (SAS). The results indicated that 57.1% of 419 clients had one or more co-occurring psychiatric disorder, along with a substance-related disorder. Of the 239 with a COD, 155 had a mood disorder, 40 had an anxiety disorder, 39 had ADHD, 35 had an eating disorder, eight had a conduct disorder and five had schizophrenia. Statistically significant relationships were found for ADHD with cannabis-related disorders and polysubstance dependence; anxiety-related disorders with alcohol-related disorders; and mood disorders with cocaine-related disorders, possibly substance-induced disorders and substance-induced disorders. These results showed that a large group of patients admitted at the centre had one or more COD and this made the treatment more complex. The results of this study suggest the need to develop specialized treatment programmes for patients with CODs.

Keywords: *substance abuse, substance dependence, substance-related disorders, psychiatric disorders, anxiety disorders, schizophrenia, mood disorders, attention deficit hyperactivity disorder, drug and alcohol rehabilitation centre, treatment, South African, dual diagnosis, co-occurring disorders*

Introduction

Substance abuse is a universal social problem. The World Health Organization (2004) cites research showing that the abuse of alcohol and other substances has a negative impact on the health of the drinker, the drinker's immediate environment, and society as a whole. These consequences include a higher risk of coronary heart disease, depression, suicide, interpersonal violence including domestic violence, motor vehicle and other serious accidents, work absenteeism, poverty, family discord, the spread of HIV/AIDS and teenage pregnancy (WHO, 2004). Annually substance-related problems are estimated to cost

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society over 200 billion dollars (Sadock & Sadock, 2003). Within the population of people who are dependent on substances is a group of people who have co-occurring psychiatric disorders (COD). A COD is present when a health care practitioner can establish at least one type of substance-related disorder and at least one type of co-occurring psychiatric disorder (including personality disorders). These two diagnoses need to be independent of one another and cannot simply be a cluster of symptoms resulting from one disorder (Sacks & Ries, 2003). As research into this area has advanced, researchers soon discovered that previous terms such as ‘dual disorder’ or ‘dual diagnosis’ did not adequately describe the phenomenon of CODs (Sacks & Ries, 2003). Gradually the term ‘dual diagnosis’ has become outdated, as it is confusing because it assumes that the client has only two disorders (Sacks & Ries, 2003). The new term COD allows for the possibility that a client may have more than one substance-related disorder and more than one co-occurring psychiatric disorder, as this is commonly the case.

There is no doubt that patients with CODs are particularly vulnerable because of the complex nature of their problems (Daley & Marlatt, 1997). It is reported that compared with having a psychiatric illness alone, those with a COD are strongly associated with the homeless population, those in the criminal justice system, persons who have experienced trauma, and people who are hospitalized (Alverson, Alverson, & Drake, 2000; Rounsaville, 1987, cited in Compton *et al.*, 2003; Sacks & Ries, 2003). This evidence makes it clear that having a COD can be more debilitating than having a single diagnosis (Brown & Bennett, 2004).

Depending on their theoretical orientation, various authors have different explanations for the COD phenomenon (Brown & Bennett, 2004; Harvard Mental Health Letter, 2003; Henquet, Krabbendam, Spauwen, Kaplan, Lieb, Wittchen, & van Os, 2005; Hovens, Cantwell & Kiriakos, 1994; Romach & Sellers, 1998; Sacks & Ries, 2003; Vaillant, 2000). There are five main theories that have been used by researchers in the field of addiction to understand this population. These are as follows:

- The self-medication/the psychiatric disorder is premorbid hypothesis. This theory proposes that people abuse substances as a way to self-medicate their underlying psychiatric disorder. This suggests that the psychiatric disorder caused the substance-related disorder (Vaillant, 2000). One proposed aspect of this causal relationship is due to the negative symptoms associated with psychiatric disorders. For example, a person suffering from depression supposedly abuses alcohol as a way to relieve their feelings of sadness.
- The substance-related disorder is premorbid hypothesis. This theory suggests that people who abuse substances are more likely to develop a psychiatric disorder than those who do not (Vaillant, 2000). In his study titled *The Natural History of Alcoholism*, Vaillant (2000) investigated over 600 individuals for 55 years. The results from this longitudinal study made him adamant that depression was a result, rather than a cause of alcohol abuse. Arguing from a medical perspective that views alcoholism as a disease, Vaillant (2000) did contend that depression or any psychiatric disorder could exacerbate the alcoholism, as it would for any chronic medical condition. Individual variability may account for evidence that individuals who have a predisposition to psychiatric disorders are more likely to develop these disorders when exposed to certain substances, than those without this predisposition. Research has shown that adolescents with a predisposition for psychosis were more likely to develop psychotic symptoms when abusing substances, than those without this predisposition (Henquet *et al.*, 2005).

- The CODs developed from a common vulnerability for both disorders hypothesis. Proponents of this theory postulate that substance abuse and co-occurring psychiatric disorders originate from a common vulnerability for both disorders (Hovens *et al.*, 1994). In her recently developed theory, Volkow (as cited in McGowan, 2004), one of America's most prominent drug addiction researchers and the director of the National Institute on Drug Abuse (NIDA), argues that people with attention deficit hyperactivity disorder (ADHD) and those who are dependent on substances share a similar genetic brain structure. They both have an impervious dopamine circuitry. This means that for the person with ADHD, stimulants, such as Ritalin and other drugs help them concentrate better. Similarly, a person who is prone to abusing substances finds the effects of drugs pleasing because the effects are not as overwhelming as they are for other people. Others without this same brain mechanism find the effects of these sorts of substances too overpowering and therefore are not as likely to abuse them (McGowan, 2004). Evidence that is more conclusive is needed in this area of research because it is a new field.
- The CODs exacerbate the symptoms of psychiatric and substance-related disorders hypothesis. This theory proposes that individual's psychiatric symptoms are exacerbated by substance abuse and vice versa. This reasoning is accurate considering that symptoms of depression and anxiety are most commonly associated with withdrawal from all classes of substances (Sadock & Sadock, 2003). A client may have mild symptoms of anxiety that were made worse by substance abuse because withdrawal causes more severe anxiety related symptoms. Alternatively, substance abuse may be exacerbated by increasingly severe psychiatric symptoms. In these cases, a client may be using substances to alleviate mild anxiety. Instead of the desired effect, the anxiety symptoms may increase and thereby increase the likelihood that the person will use higher and higher doses of the substance. In these cases, social substance use is likely to evolve into substance dependency, instead of remaining a relatively benign problem (Sadock & Sadock, 2003).
- The no causal relationship hypothesis. Findings from this body of research conclude that there is no univariate relationship between substance abuse and other psychiatric disorders. Research conducted by Drug and Alcohol Treatment Outcome Study (DATOS) revealed that as the rates of psychiatric disorders increases, the number of substance use disorders increases. This shows that there is a relationship between the number of substances used and the number of psychiatric disorders diagnosed. However, there is still no clarity regarding the causality of this relationship (Sacks & Ries, 2003)

It is clear that the relationship between the two diagnoses is a complex one. This relationship highlights the mind–body dualism that is the pervasive philosophy in western society. This philosophy continues to have a huge impact on the way people with a COD are understood and treated (Swartz, 1998). Over 10 years ago, Hovens *et al.* (1994) concluded that psychiatric disorders might precede, develop as a consequence of, exacerbate, be linked to, not be related to, or originate from a common vulnerability for substance abuse. Since then, there seems to have been little development in understanding this complex relationship. It seems most likely that, as with many things in life, there is no simple cause–effect relationship. Rather multiple variables are responsible for multiple effects, which in turn have multiple effects, and the cycle continues.

Considering these various hypotheses, debate surrounding the best way to treat this phenomenon is understandable. The conflict concerns which problem to treat first, or whether to treat them together (Alverson *et al.*, 2000; Beeder & Millman, 1997; Sadock &

Sadock, 2003). Traditional approaches to treating the client with a COD focus on the substance-related disorder, with little emphasis on the co-existing psychiatric disorder. This medical model views the co-morbid psychiatric condition as being a result of the substance abuse in the majority of cases. From this perspective, if the substance abuse is successfully treated (sobriety is maintained), the co-occurring psychiatric disorder will usually disappear (Vaillant, 2000). Current perspectives contend that treatment should take an individual focus that is tailor-made to suit the individual who inevitably has a unique comorbidity of diagnoses, different cognitive abilities and different levels of motivation for treatment (Stanley & Pearson, 2003; Sacks & Ries, 2003). For example, a client who abuses cannabis, has schizophrenia, is unmotivated for treatment and has an average cognitive ability; will not require the same treatment as a client who abuses alcohol, suffers from depression and is motivated for treatment. Proper screening and assessment to establish the specific combination of COD's is necessary in order to plan an appropriate intervention strategy (Stanley & Pearson, 2003). The Center for Substance Abuse Treatment (CSAT) Treatment Improvement Protocol (TIP) Number 42 (Sacks & Ries, 2003) describes four different 'quadrants of care' to assess what level of treatment a client needs. These are as follows:

- less severe mental disorder and less severe substance use disorder;
- more severe mental disorder and less severe substance disorder;
- less severe mental disorder and more severe substance disorder;
- more severe mental disorder and more severe substance disorder.

These quadrants guide the type of treatment an individual should receive. For example, a client assessed to be in the fourth quadrant would require intensive in-patient treatment, while an individual in the first quadrant would require less intensive outpatient treatment (Sacks & Ries, 2003).

Experts in the field agree that treatment for the client with a COD needs to be comprehensive, integrated, and continuous. Comprehensive refers to the idea that treatment should be capable of responding to the multiple problems that each individual client experiences. The treatment plan should be made with the client's input. Integration concerns combining substance abuse and mental health treatment, thereby treating the individual as a unitary whole and not as two separate mind-body divisions. Continuous treatment means that the client may need to be treated for months, or possibly years. Coherent care spanning a long period is therefore needed (Sacks & Ries, 2003).

There is no doubt that there is a great need to be aware of the strong relationship between substance-related and co-occurring psychiatric disorders (Kokkevi & Stefanis, 1995). From the available international research it has been shown that this comorbidity rate is between 50 and 90% (Alverson *et al.*, 2000; Beeder & Millman, 1997; Strathdee, Manning, Best, Keaney, Bhui, Witton, Wall, McGillivray, Marsden, Johnson, Piek, & Wilson-Jones, 2002; Weaver, Charles, Carnwath, Madden, Renton, Stimson, Tyrer, Barnes, Bench, & Paterson, 2002). Despite this high rate, the co-occurrence of two or more disorders is often not established by mental healthcare professionals (Weaver *et al.*, 2002). South African COD prevalence rates could not be located. National research initiatives publishing substance abuse statistics, such as the South African Community Epidemiology Network of Drug Use (SACENDU) report make no mention of CODs in their published findings, other than to say that some of their sample comes from psychiatric institutions and that there is a relationship between psychological factors and substance abuse (Pluddeman, Parry, Bhana, Harker, Potgieter, Gerber, & Johnson, 2005). This is the largest research initiative reporting on addiction-related statistics in South Africa. The fact that there is such a huge gap in their reported findings

makes it clear that research in this area is required. South African prevalence rates are important to determine, in order to estimate the size of this vulnerable population. This would be the first part of the process of developing screening and treatment strategies catered for the South African COD population.

Considering this research rationale, the aims of this research project were:

- to find the prevalence rate of people who have a COD and who seek rehabilitation at a private rehabilitation centre in Johannesburg, South Africa;
- to describe the biographical details and other characteristics of the people who have a COD from this sample;
- to find the prevalence rates of the specific substance-related disorders (abuse or dependence) and the prevalence rates of the specific co-occurring psychiatric disorders that the people with a COD presented with;
- to see if there is a significant relationship between any of substance-related disorder variables and any of the co-occurring psychiatric disorder variables that the clients were diagnosed with.

Methods

This study was a quantitative, anonymous retrospective record review. It was based on simplifying interview data into a numerical format and then statistically analysing this information. The records reviewed were in the form of 419 interviews conducted with patients being admitted to a private rehabilitation centre in Johannesburg, South Africa.

Sample

This private facility charges approximately £1959.89 for an 8-week recovery programme. The first 6 weeks involve an in-patient stay at the centre and the last 2 weeks an outpatient programme. The sample consisted of 419 patients who were all seeking treatment. Of the 419 admitted 239 consisted of the COD sample. The biographical details of this sub-sample were as follows:

For the COD sample, 55% were male and 45% were female. The mean age of the sample was 31, with a standard deviation of 11. Forty per cent were between the ages of 20 and 29. The youngest person was 16 and the oldest was 65. The mean age of the sample differed according to the type of substance abused. For sedative-, hypnotic-, or anxiolytics, it was 37, for alcohol 34, for cocaine 29, for polysubstance dependence and opioids 27, for cannabis and amphetamines 26, and for hallucinogens 19. The majority of the sample was educated to a matric (36%) or tertiary (31%) level. Only 3.5% were educated to a grade 6, 7 or 8 level (the lowest educational level category found). Sixty-one per cent were not married. Thirty-two per cent had two or more co-occurring psychiatric disorders. Eleven per cent had a personality disorder diagnosed on axis II and another type of psychiatric disorder diagnosed on axis I.

Statistical analysis

The computerized programme Statistical Analysis Software 9.1 [(SAS), SAS Institute, 2002] was used to analyse the collected data. Variables were coded and entered onto SAS.

Descriptive data in the form of frequency tables were obtained. This allowed the prevalence rates to be revealed (Howell, 1999).

In order to determine if there was a significant relationship between any of the dichotomous, nominal variables of the COD sample, chi-square tests of association were conducted comparing all the substance-related variables with all the co-occurring psychiatric disorder variables (Howell, 1999). A significance level of 0.05 was used throughout. Only chi-square statistics that met the expected frequency counts for each cell were interpreted for validity purposes.

Ethical considerations

All names of the participants were removed from the case histories and replaced with codes. This ensured anonymity, as the researcher was not able to identify any of the clients whose histories were investigated. The patients whose histories and case files were used signed consent forms on their admission to the rehabilitation centre allowing their information to be used for research purposes.

Results

Prevalence rate of co-occurring disorders

Fifty-seven per cent of the sample was diagnosed as having a substance-related disorder, as well as a co-occurring psychiatric disorder (Table I).

The relationship between the substance-related disorder and the co-occurring psychiatric disorder

Table II shows that a statistically significant relationship was found between alcohol-related disorders and anxiety disorders. A statistically significant relationship was found between cannabis-related disorders and ADHD. A statistically significant relationship was found between cocaine-related disorders and mood disorders. A statistically significant relationship was found between polysubstance dependence and ADHD. A statistically significant relationship was found between possibly substance-induced disorders and mood disorders. A statistically significant relationship was found between substance-induced disorders and mood disorders.

Prevalence rates of specific substance-related disorders (n=239)

Figure 1 shows the frequency and percentage of the various substance-related disorders that the COD sample presented with.

Table I. Frequency table showing the prevalence rate of CODs for the whole sample (n=419)

COD	Frequency	%
No	179	42.93
Yes	238	57.07

Frequency missing=2.

Table II. The following statistically significant relationships were found between the co-occurring psychiatric disorder variables and the substance-related variables investigated

Substance-related disorders	Co-occurring psychiatric disorders		
	ADHD	Anxiety	Mood
Alcohol		$P=0.0088$	
Cannabis	$P=0.0274$		
Cocaine			$P=0.0046$
Polysubstance	$P=0.0002$		
Possibly substance-induced			$P=0.0077$
Substance-induced			$P=<0.0001$

Prevalence rates of the specific co-occurring psychiatric disorders (n=239)

Figure 2 shows the frequency and the percent of various co-occurring psychiatric disorders that the COD sample presented with.

Discussion

COD prevalence rate

The results from this study revealed that 57% of the people admitted to the rehabilitation centre had a substance-related disorder, as well as one or more co-occurring psychiatric disorder/s. This statistic concurred with international research, which found that the comorbidity of substance-related disorders and other psychiatric disorders is between 50 and 90% (Alverson *et al.*, 2000; Beeder & Millman, 1997; Strathdee *et al.*, 2002; Weaver *et al.*, 2002). It seems that South African statistics are no different from international findings. There is clearly a large group of people who would benefit from specialist treatment facilities and interventions that are planned to meet their complex individual needs.

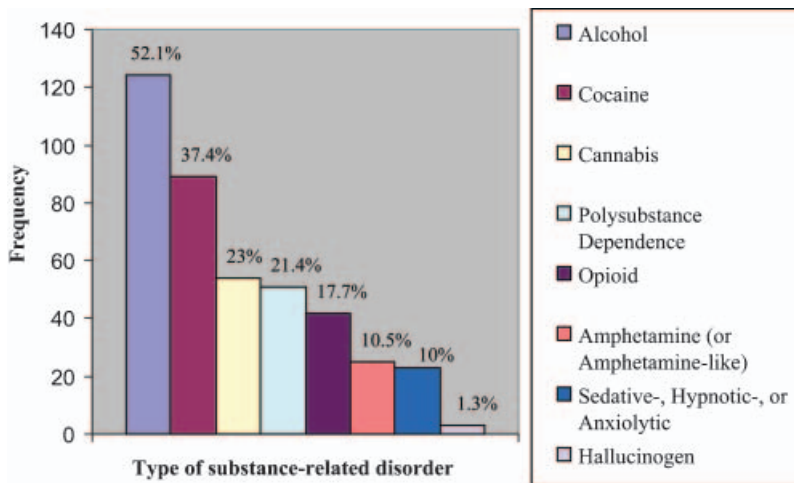


Figure 1. The frequency and the percent of the various substance-related disorders that the COD sample presented with.

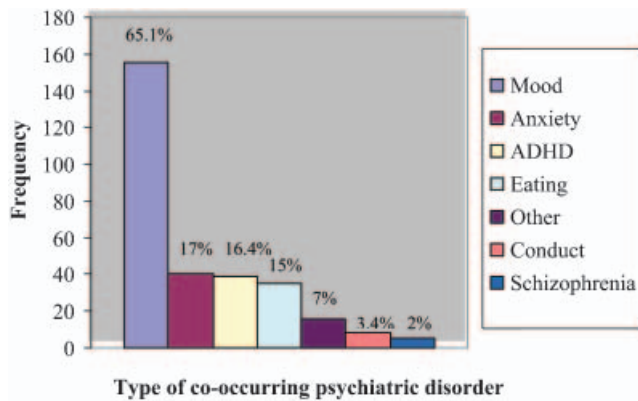


Figure 2. The frequency and the percent of various co-occurring psychiatric disorders that the COD sample presented with.

Gender differences

The majority of the COD sample was male (55%) and 45% were female. This statistic is in keeping with results that often have often found that males are over represented in studies of substance abuse (Pluddeman, Parry, Bhana, Harker, Potgieter, Gerber, & Johnson, 2005). Rosenfield, Phillips, & White (2006) argue that there are compelling and reliable research results that prove very strong gender differences exist, when investigating mental illnesses and substance abuse. Rosenfield *et al.* (2006) found that females tend to internalize their problems, suffering more frequently from depression and anxiety. Alternatively, males tend to externalize, suffering more often from aggression, delinquency and substance abuse (Rosenfield *et al.*, 2006). It is argued that there is greater stigma associated with female substance abuse (Blume, 1999; Green, 2006). According to Green (2006), women have trouble accessing treatment because they fear retribution from the Social Welfare System. This system often assumes child rearing to be the female's domain. Another reason is the fact that most treatment facilities do not accept pregnant women or women with their children. Other Studies have found that women are less likely than men to access treatment due to limited finances and domestic responsibilities (Blume, 1999).

What was interesting about the findings from this study, was that when the gender prevalence rates for the COD and non-COD sample were compared, there was a more equal distribution of males and females in the COD sample, than in the non-COD sample. For the non-COD sample, 71% were male and 29% were female. For the COD sample, 55% were male and 45% were female. A chi-square test of association revealed that a statistically significant proportion of women versus men were diagnosed with a COD. Significance level of 0.05, $df=1$, $\chi^2=11$, $p=0,033$. This theme has been found in other studies. For example, admissions of people with CODs into American prisons, were more likely to be female, than substance abuse only admissions (Dasis, 2002, as cited in Dolan, Kolthoff, Schreck, Smilanich, & Todd, 2003). In a study conducted in Los Angeles, in a public outpatient substance abuse treatment facility, Watkins, Hunter, Wenzel, Tu, Paddock, Griffin, & Ebener (2004) found that, for their non-COD sample, 75% were male and 25% were female. For their COD sample, 52% were male and 48% were female. This pattern can be explained as follows. South African research conducted in the Western Cape investigating the prevalence rate of the gender of people admitted to psychiatric hospitals found that overall admissions were more likely to be female than male (Strebel, Stacey &

Msomi, 1999). If psychiatric disorders are more likely to be diagnosed in women and substance-related disorders in men, then it would make sense that in a study combining these two variables, the gender ratios would be similar.

Marital status of the COD sample

The high proportion of people who have never been married was not surprising considering the multitude of problems that having a COD, as compared with people with a single diagnosis, has been associated with. These include:

- significantly poorer social functioning;
- problems that are more complex;
- greater criminal involvement;
- displaying more risk behaviours;
- having a poorer quality of life (Strathdee *et al.*, 2002; Weaver *et al.*, 2002).

These problems would make staying in a stable long-term marriage difficult.

Two or more co-occurring psychiatric disorders

The high rates of COD clients diagnosed with two or more psychiatric conditions, and the fact that 11% of the sample had an axis II personality disorder combined with an axis I disorder shows that there is a large group of people who have particularly complicated treatment needs. This is due to the array of and complexity of disorders they presented with.

Prevalence rates of the substance-related disorders

The majority of the sample (52%) was diagnosed with an alcohol-related disorder. This rate has been corroborated by many studies of substance abuse, which have found that alcohol is the most frequently abused substance internationally (Sadock & Sadock, 2003). For example, for their COD population Watkins *et al.* (2004) found that 69% of their sample reported using alcohol. It would seem that the rates of alcohol abuse found in COD populations are between 10 and 20% higher than those found in samples that have not been distinguished into COD or not (general samples). For example, SACENDU found that 38% of the sample of people seeking treatment for substance abuse in Gauteng, Johannesburg reported abusing alcohol (Pluddeman *et al.*, 2005). The higher rates of alcohol abuse in the COD samples may be because of the statistically significant relationship found between anxiety disorders and alcohol-related disorders discussed below.

Thirty-seven per cent of the COD sample had a cocaine-related disorder. Watkins *et al.*, (2004) found that 40% of their COD sample reported using cocaine and/or crack. The finding from this study was 25% higher than the rates of cocaine/crack abuse reported by SACENDU, who found that 12% of their sample reported cocaine abuse (Pluddeman *et al.*, 2005). As discussed below, a statistically significant relationship was found between cocaine and mood disorders. This may have accounted for this higher prevalence rate of cocaine abuse in the COD sample from this study, as discussed below.

This study also found another substance abuse trend difference for the COD sample. It was discovered that overall cocaine use was higher than cannabis use. This was in contrast

to SACENDU findings, which has consistently shown that cannabis is usually the second most common substance of use, after alcohol (Pluddeman *et al.*, 2005). SACENDU noted that despite an increase in cocaine abuse in the last decade, this trend seemed to be levelling off (Pluddeman, Parry, Bhana, Harker, Potgieter, Gerber, & Johnson, 2006). The trend found in this study may have been related to the type of affluent clients who went for treatment at this rehabilitation centre. These clients would most likely be able to afford the high cost of cocaine. In addition, cocaine is considered a trendy drug associated with improved work performance and increased confidence (Edmonds & Wilcocks, 2000). This reasoning may make cocaine the drug of choice for high achievers.

Twenty-three per cent of the COD sample was diagnosed with a cannabis-related disorder. SACENDU found almost the exact same results, in that 22% of their general Gauteng sample reported cannabis abuse (Pluddeman *et al.*, 2005).

Twenty-one per cent of the sample was diagnosed with polysubstance dependence. This is in keeping with findings that indicated that people often abuse more than one substance (Weaver *et al.*, 2002). SACENDU stated that the abuse of two or more substances is high in South Africa. In Cape Town, a reported 50% of patients indicated abusing more than one substance (Pluddeman, Parry, Bhana, Harker, Potgieter, Gerber, & Johnson, 2004). These people would not necessarily meet the diagnostic criteria for polysubstance dependence, but this finding showed that people often abuse more than one substance at a time. This phenomenon is likely to be related to developing a tolerance to certain substances. For example, a person may develop a tolerance to alcohol, with the result being that they need more and more of the substance to enjoy its effects. The user's tolerance may be so strong that they need alternative substances, such as cocaine, cannabis, heroin etc., in addition to alcohol, in order to achieve the same high (Sadock & Sadock, 2003). This cycle is likely to continue, resulting in the abuse of multiple substances.

The results from this study revealed that 18% of the COD sample was diagnosed with an opioid-related disorder. This is much higher than what Watkins *et al.* (2004) found. Their results showed that 5% of their sample reported using heroin. SACENDU found similar results to the international findings in that 7% of their Gauteng general sample reported abusing heroin (Pluddeman *et al.*, 2005). The higher rate found in this study may be because opioids were considered as a group and heroin was included in this group. This higher prevalence rate for the COD sample was also likely to have something to do with the relationship found between substance abuse and co-occurring psychiatric disorders. The nature of this relationship requires further investigation, as a significant relationship was not found between opioids and any co-occurring psychiatric disorders.

Ten-and-a-half per cent of the sample was diagnosed with an amphetamine (or amphetamine-like)-related disorder. Again, these results were higher than the SACENDU general sample findings. They found that 5% of their general Gauteng sample reported abusing ecstasy and CAT (methcathinone; Pluddeman *et al.*, 2005). This is likely to have something to do with the relationship between substance abuse and co-occurring psychiatric disorders. The nature of this relationship requires further investigation, as a significant relationship was not found between amphetamines and any co-occurring psychiatric disorder.

The findings revealed that 10% of the sample was diagnosed with a sedative-, hypnotic-, or anxiolytic-related disorder. This statistic was similar to international findings, as Watkins *et al.* (2004) found that 8% of their sample reported using sedatives and/or opiates. SACENDU found a prevalence rate of 4% in their Gauteng sample (Pluddeman *et al.*, 2005). Again, the statistics from this study were higher than the general SACENDU

sample equivalent. This was likely to have had something to do with the relationship between substance abuse and co-occurring psychiatric disorders. Again, the nature of this relationship requires further investigation, as a significant relationship was not found between sedative-, hypnotic-, or anxiolytic-related disorder and any particular co-occurring psychiatric disorder.

One per cent of the sample was diagnosed with a hallucinogen-related disorder. This is similar to SACENDU results, which indicated that <1% of people reported abusing LSD in their Gauteng sample (Pluddeman *et al.*, 2005). This shows that this substance is not widely abused in South Africa.

Prevalence rates of the co-occurring psychiatric disorders

Sixty-five per cent of the sample was diagnosed with mood disorders. This finding was corroborated by other results. Similar studies found that the prevalence rate of mood disorders was about 60% in the substance-abusing treatment-seeking COD population (Strathdee *et al.*, 2002; Watkins *et al.*, 2004). This phenomenon is discussed below.

The prevalence rate for anxiety disorders (17%) was much lower than other findings. Prevalence rates of between 50 and 60% have been found (Strathdee *et al.*, 2002; Watkins *et al.*, 2004). The reason for this finding was unclear, especially considering the relatively equal representation of men and women (who most often present with anxiety disorders) in this sample.

The finding that 16% of the COD sample was diagnosed with ADHD concurred with other research into the prevalence rates of ADHD in the treatment seeking substance-abusing population. Researchers in the field found that ADHD affects between 11 and 35% of the adult population who abuse substances (Clure, Brady, Saladin, Johnson, Waid & Rittenbury, 1999; Kalbag & Levin, 2005). This is in comparison with 1–5% of the general adult population who has ADHD (Kalbag & Levin, 2005).

Fifteen per cent of the sample had an eating disorder. This was similar to results found by Hudson, Weiss, Pope, McElroy, and Mirin (1992). Their sample consisted of patients hospitalized for substance abuse and they found that 15% of women had a lifetime diagnosis of anorexia or bulimia nervosa, compared with only 1% of men.

This study established a prevalence rate of 3% for conduct disorders. A previous study using a sample of substance-abusing adolescents and adults found that 15% met criteria for conduct disorders (Mueser, Rosenberg, Drake, Miles, Wolford, Vidaver, & Carrieri, 1999). A prevalence rate of 3% in these findings, was closer to that found in the general population (between 1 and 10%; Sadock & Sadock, 2003). This was likely because there were not many adolescents in this sample. The mean age of those diagnosed with conduct disorder was 19, with a standard deviation of 2. The oldest client was 22 and the youngest 17. If the symptoms of conduct disorder continue into adulthood, the psychologist (Sadock & Sadock, 2003) would usually give a diagnosis of antisocial personality disorder. In the cases of the adults diagnosed with conduct disorder, the psychologist may have given this diagnosis pending more investigation into the client's behaviour. This investigation would have established more certainly if the client had, in fact, developed an antisocial personality disorder or if they had outgrown the conduct disorder.

The finding that 2% of the sample had schizophrenia was much lower than rates found in similar studies. Watkins *et al.* (2004) found that 14% of their sample, had probable psychosis and Strathdee *et al.* (2002) found that 37% of people who went for treatment for substance abuse had psychosis. The reason for this finding could be that a diagnosis of

schizophrenia requires a lot more than only psychotic symptoms. Furthermore, clients who have diagnosable schizophrenia and abuse substances may be more likely to seek treatment at a psychiatric institution than at a rehabilitation centre, due to the severity of their symptoms.

Relationship between substance-related and psychiatric disorder variables

ADHD with polysubstance dependence and cannabis. The relationship found between ADHD and cannabis-related disorders was an interesting one because authors have often concluded that clients with ADHD self-medicate with stimulants, such as cocaine and amphetamines because these are the substances most likely to relieve their symptoms of ADHD (Beeder & Millman, 1997). However, it is not as well known that there is also widespread use of alcohol, sedative-hypnotics and tranquilizers in the population of people suffering from ADHD. People diagnosed as having ADHD report decreased symptoms with both the use of stimulants and depressants (Beeder & Millman, 1997). Clure *et al.* (1999) found that ADHD had no single relationship to a specific substance of abuse. These authors concluded that characteristics such as impulsiveness and poor scholastic performance could predispose those suffering from ADHD to abuse any substance, not just one in particular. The easy accessibility of cannabis in South Africa may explain why this study found a significant relationship between these two variables (Pluddeman *et al.*, 2005). A significant relationship was also established between polysubstance dependence and ADHD. This supported Clure *et al.*'s (1999) argument that poor impulse control associated with ADHD predisposes those with this disorder to indiscriminately abuse substances.

The theory that substance abuse and co-occurring psychiatric disorders may originate from a common vulnerability for substance abuse is another possible explanation for this finding (Hovens, Cantwell & Kiriakos, 1994). In her recently developed theory, Volkow (as cited in McGowan, 2004) argues that people with ADHD and those who are dependent on substances share a similar genetic brain structure. They both have an impervious dopamine circuitry. This means that for the person with ADHD, stimulants, such as Ritalin and other drugs help them concentrate better. Similarly, a person who is prone to abusing substances finds the effects of drugs pleasing because the effects are not as overwhelming as they are for other people. Others without this same brain mechanism find the effects of these sorts of substances too overpowering and therefore are not as likely to abuse them. As a result, a substance abuser's brain cannot concentrate as well as other brains because of being overstimulated by constant substance abuse. The addict can only focus on one thing- obtaining more and more of their substance of choice. The brain pathways associated with other interesting stimuli are no longer used and therefore lose strength. This would ultimately result in more symptoms of ADHD, as the person is unable to attend to things that other people would be able to (McGowan, 2004).

Anxiety disorders and alcohol. The association between alcohol and anxiety has often been found in studies of alcoholism (Vaillant, 2000). Studies have suggested that about one-third of people who meet the diagnostic criteria for alcohol dependence, also meet the criteria for an anxiety disorder (Goodwin & Gabrielli, 1997). Goodwin and Gabrielli (1997) claim that 'Drinking relieves guilt and anxiety, then produces anxiety and depression' (p. 143). This leads to a vicious cycle of anxiety, then drinking, then more anxiety. What complicates the matter is that the withdrawal symptoms from alcohol are

very similar to those categorized as anxiety-related symptoms, according to the DSM-IV-TR's criteria (American Psychiatric Association, 2000). These include insomnia, irritability, heart palpitations and often full-blown panic attacks. Given this evidence, it is no wonder that a significant relationship emerged between these two variables. Diagnoses were given after a 5-day detoxification process, however, anxiety-related withdrawal symptoms may only subside 2–4 weeks after last use (Brown & Schuckit, 1998, as cited in Brady, Halligan, & Malcolm, 1999). In the case of this relationship, it is impossible to say whether the anxiety disorder preceded, developed as a consequence of, was exacerbated by, was linked to, or originated from a common vulnerability for an alcohol-related disorder (Hovens *et al.*, 1994).

What was interesting was that no significant relationship was found between mood disorders and alcohol-related disorders. This may have been due to the high percentage rate of those identified with a mood disorder and the high rate of those diagnosed with an alcohol-related disorder. With such a high rate, there is a high probability that the number of alcohol-related disorders and the number of mood disorders could have simply co-occurred by chance.

Mood disorders and cocaine. According to Gold (1997), at least half of those who seek treatment for substance abuse also meet the diagnostic criteria for a mood disorder. Sadock and Sadock (2003) describe mood disorders as those most likely to follow the onset of cocaine-related disorders. A possible reason for this finding is that cocaine use may have an effect on the user's ability to experience positive emotions. This could ultimately lead to a mood disorder, most likely depression. Researchers were not able to determine if the depressive symptoms were related to long or short-term cocaine use (Little, Krolewski, Zhang, & Cassin, 2003).

This study also found that mood disorders were associated with possibly and definitely a diagnosable substance-induced disorder. This was likely because depressive symptoms are those most associated with withdrawal from all substances (Brady *et al.*, 1999). In the definitely substance-induced cases, the psychologist could establish that the mood disorders were the direct result of substance abuse. This would result in the diagnosis of a substance-induced disorder. In the cases of a possibly substance-induced disorder, it was likely that the psychologist making the diagnoses was tentative about diagnosing a mood disorder because of the possibility that the symptoms could have been withdrawal related. The results from this study indicated that in terms of the relationship that exists between mood disorders and substance-related disorders, it was most likely that mood disorders developed as a consequence of, exacerbated, or originated from a common vulnerability for cocaine abuse (Hovens *et al.*, 1994).

Strengths and limitations

This study had the following strengths:

- the psychologist who conducted the interviews has had 10 years experience in the field of addiction;
- the sample size was 419 interviews, therefore making the statistical findings more reliable;
- quantitative research allows the results to be generalized to a broader population than qualitative research.

This study had the following limitations:

- There was only one psychologist conducting the interviews, therefore no inter-rater reliability was established. This may have affected the reliability and validity of the results.
- The data relied on the self-report of the clients. This made hiding any area that the clients were not comfortable with, relatively easy to do.
- There were certain characteristics of the sample that made it difficult for generalizations to the broader population to be made. These include the fact the sample was seeking treatment and the sample had to be able to afford the treatment at a private facility.
- No racial demographics were included in the interview format. These would have helped gain a more in depth understanding of the population
- Quantitative research does not produce rich, in depth, detailed results. Individual case studies were not investigated, which meant that the data was less detailed than it could have been.
- The interviews were done over a three-year time span. This may have affected the consistency of the way in which the data was captured. However, the same structured interview form was used and the psychologist based his diagnoses on the same criteria for every interview.
- No current versus lifetime prevalence rate was established for the disorders investigated.

Conclusion

These research findings add to a dearth a knowledge concerning the COD phenomenon. This study has clarified the need for specialist treatment centres for this population. As a growing field of research, much more information is needed in this area. This study is one-step further to understanding this vulnerable population. It is recommended that:

Awareness-raising workshops focusing on the COD phenomenon be developed and conducted with professionals involved in the field of addiction. These workshops need to highlight the complexity of CODs and the related problems and possible solutions to treating this group.

An assessment tool for identifying CODs should be developed. This tool should be based on that proposed by the Sacks and Ries in the CSAT TIP 42 (2003).

More research studies should be conducted to investigate CODs internationally.

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