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ORIGINAL ARTICLE

Mental health and substance use problems among patients in substance use disorder treatment as reported by patients versus treatment personnel

Tone H. Bergly^{1,2}, Roger Hagen², and Rolf W. Gråwe¹

¹Department of Research and Development, Clinic of Substance Use and Addiction Medicine, St. Olav's University Hospital, Trondheim, Norway and

²Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway

Abstract

Objective: We examined and compared mental health and substance use problems among patients in substance use disorder treatment as reported by both patients and treatment personnel, and explored the feasibility of the quadrant model in addressing severity of mental health and substance use based on reports by treatment personnel.

Methods: Patients receiving inpatient substance use treatment at clinics in Norway were recruited for the study; 85 completed a cross-sectional survey. Treatment personnel completed a separate survey and gathered information from patient charts.

Results: While there were minor differences in the patient and personnel reported prevalence of mental disorders in general (34 and 41%, respectively), there were significant differences in reported affective disorders ($p=0.05$) and personality disorders ($p=0.02$). Based on the quadrant model, 70.2% of the patients had a high severity of substance use and low severity of mental health problems, while 21.4% had high severity of both.

Conclusions: The differences in reports of mental disorders are important, and future research should aim to increase the validity and reliability of reported mental health problems among patients with substance use disorders. The quadrant model does seem to be a feasible model in addressing the severity of such co-occurring disorders.

Keywords

Mental health, substance use, treatment, co-occurring disorders, quadrant model

History

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Introduction

About 27% of adults in European countries report suffering from one or more psychiatric disorders in the last 12 months (Wittchen & Jacobi, 2005). The presence of a psychiatric disorder is associated with an increased risk for substance use, abuse or dependence (Flynn & Brown, 2008; Swendsen et al., 2010). There seems to be a robust relationship between the magnitude of co-occurring psychiatric disorders and the severity of substance use disorders (Janè-Llopis & Matytsina, 2006; Merikangas et al., 1998). People with more than one psychiatric disorder also tend to have a greater need for treatment and the course of illness is more severe both in terms of their mental health and substance use disorders (Mueser et al., 2006). Worse outcomes are often seen in areas like psychiatric symptoms, physical health and relapses to substance use.

There are particularly strong relationships between mood and anxiety disorders, conduct disorders and antisocial personality disorders, and substance use disorders (Merikangas et al., 1998). One study found that anxiety and

depressive disorders were the most common co-occurring psychiatric disorders in a Norwegian sample of inpatients with substance use disorder (Landheim et al., 2002). Results from this study also suggested that at least two-third of the patients were in need of treatment both for their psychiatric disorders and substance use disorders. The prevalence of co-occurring disorders is found to be high in the general population and in treatment populations in international studies for both substance abuse and mental health problems (Flynn & Brown, 2008; Regier et al., 1990; Wittchen & Jacobi, 2005). Since a rather large part of the patient population has co-occurring disorders, treatment should strive to target patients' needs related to these problems.

Patients' needs and co-occurring disorders can be explored by asking patients themselves to report or by collect information from treatment staff, charts, records, etc. Self-reported consumption of alcohol and other substances have shown to be accurate (Babor et al., 2000; Jackson et al., 2005). However, psychiatric disorders could be perceived to be stigmatizing and discrepancies between reports could be expected (Bhandari & Wagner, 2006). Hence, it could be expected that some self-reported information from patients with co-occurring disorders could vary in accuracy.

Co-occurring disorders differs in their severity and will also influence each other in different ways. Studies show

Correspondence: Tone Helene Bergly, Clinic of Substance Use and Addiction Medicine, St. Olav's University Hospital, PO Box 3250 Sluppen, 7000 Trondheim, Norway. Tel: +47 73 86 29 14/+47 938 52 189. Fax: +47 73 86 29 01. E-mail: Tone.Helene.Bergly@stolav.no

that co-occurring disorders are common and there are major differences between treatment facilities with respect to the treatment they provided to this group of patients (Flynn & Brown, 2008; McGovern et al., 2006). It seems from research findings that patients with a high severity of co-occurring problems matched to high service-intensity programs have better treatment outcomes than patients with high co-occurring severity treated in low-intensity programs (Chen et al., 2006). Therefore, it is important to match patients' symptom severity to the right level of treatment care (Flynn & Brown, 2008).

The quadrant model, developed by the US National Association of State Alcohol and Drug Abuse Directors and the US National Association of State Mental Health Program Directors, is a conceptual model used to differentiate between systems of care (Substance Abuse and Mental Health Services Administration, 2002). There are four different parts in the quadrant model, see Table 1 for an illustration. Low severity of substance use and psychiatric disorders (quadrant I); low severity of substance use and high severity of mental health problems (quadrant II); high severity of substance use and low severity of mental health problems (quadrant III); and, finally, high severity of both substance use and mental health problems (quadrant IV). The idea of the model is that different degrees of co-occurring disorder warrant differential treatment services (Mueser et al., 2006). Patient placement and locus of care can be guided by the quadrant model (McDonnell et al., 2012). Patients in the third quadrant are typically receiving treatment in substance use services, while patients in the second quadrant are treated in mental health services. The fourth quadrant is the shared responsibility of both substance use and mental health services and demand collaboration between services. This quadrant highlights the importance of integrated treatment, receiving treatment for both illnesses at the same time (Brunette et al., 2004; Mueser et al., 2006). Persons in the first quadrant, with less severe mental health and substance use problems, might profit from treatment with-in the primary health care system. Originally, the application of the quadrant model was intended for use at the system level, but it has also been introduced at an individual level.

The feasibility of the quadrant model has been tested. In a study (McGovern et al., 2007), patients with co-occurring disorders were classified by the severity of their mental health problems and their substance use problems. Findings supported the feasibility of applying this model at an individual level. The validity of the quadrant model has also been supported by significant correlations between

initial and follow-up placement of patients in quadrants (McDonnell et al., 2012). This model could be considered helpful in determining appropriate placements based on the severity of co-occurring disorder and necessary levels of care (Flynn & Brown, 2008).

Aims of the current study

The aims of this study were three-fold. The first was to explore the prevalence of co-occurring mental health problems and substance use disorders among individuals receiving treatment for substance use disorders in Norway, as reported by both patients and treatment personnel. Second, we aimed to compare self-reports from patients to the ICD-10 diagnosis reported by treatment personnel related to the patients' mental health and substance use problems. This study has information from both treatment personnel and patients and this provide us with the opportunity for comparing them and investigate any potential differences in reports. Finally, we wanted to explore the feasibility of the quadrant model as a treatment personnel-based tool for categorization and conceptualization of individual patients' severity of mental health and substance use problems and service needs in the sample.

Methods

Design

This study used a sample of patients from different substance use disorder inpatient treatment clinics in Central Norway. Data were collected from May 2011 to May 2012. The inclusion criteria to take part in the study were that participants had to be over 18 years of age and receiving treatment for substance use disorders at an inpatient clinic. Written informed consent was obtained after a complete description of the study to eligible participants. Respondents who consented to participate answered an electronic questionnaire during their last week of treatment at the inpatient clinic. The patients were also asked to consent to treatment personnel completing a questionnaire about their treatment. Both questionnaires had a code making it possible to link them for data analyses. The study was conducted in accordance with the Declaration of Helsinki and approved by the Regional Committee for Medical and Health Research Ethics in Central Norway.

Questionnaires

Patients answered a questionnaire, which were the result of the researchers own creation, about demographics, substance use and mental health, and treatment. Questions about substance use were related to the main substance and other substances used. Patients were to choose from a list naming different substances. The participants were asked if they had one or more psychiatric diagnoses by answering yes or no. Patients who answered yes were to choose one or more disorders from a list naming different psychiatric disorders. Finally, the questionnaire asked about their previous and current treatment for this/these disorder(s).

Treatment personnel answered a separate questionnaire about each patient's substance use and mental health.

Table 1. The quadrant model.

The quadrant model. Severity of illness	
III Less severe mental disorder/ High severe substance disorder	IV High severe mental disorder/ High severe substance disorder
I Less severe mental disorder/ Less severe substance disorder	II High severe mental disorder/ Less severe substance disorder

The quadrant model was used to assess the patients' severity of mental health and substance use problems. Treatment personnel were asked to rate the patients according to the quadrants by using their experience treating people with substance use disorders and their knowledge about the individual patient (e.g. substance use disorders, mental health problems, medication, previous treatment, etc.) to place the patients into the quadrant in which the treatment personnel judge the patient to belong in. In addition, they were asked to report the International Classification of Diseases-10 (ICD-10) diagnoses from the patient's chart. The reported ICD-10 diagnoses were divided into psychiatric diagnosis (excluding those due to substance use) and substance use diagnosis sections in the questionnaire; this classification will be used through the rest of the paper. It was possible for the treatment personnel to report up to five diagnoses in each section. The diagnoses were further categorized by one of the authors (THB) into main blocks based on the reported ICD-10 codes.

Participants

In total, 119 patients consented to participate in this study. Of these, 85 answered the patient questionnaire. The gender distribution in the sample was 25.9% women ($n=22$) and 74.1% men ($n=63$). This distribution of gender reflects that of Norwegian people in treatment for substance use disorders (Iversen et al., 2009). The age range in the sample was from 20 to 72 years ($M=38.3$, $SD=11.8$). The substances reported by the patients as their main substances were alcohol ($n=38$; 44.7%), stimulants ($n=25$; 29.4%), heroin ($n=9$; 10.6%), sleep medicine/sedatives ($n=6$; 7.1%), cannabis ($n=5$; 5.9%) and other substances ($n=2$; 2.4%). These substances were ingested orally ($n=43$; 50.6%), injected ($n=22$; 25.9%), sniffed ($n=13$; 15.3%) and smoked ($n=7$; 8.2%). Over half of the sample reported using more than one substance ($n=46$; 54.1%). Reported polysubstance use was in line with earlier findings from a Norwegian study in which 60% of the patients used more than one substance (Nordfjærn, 2011).

One or more mental disorders were self-reported by about one-third ($n=29$; 34.1%) of the sample, and over half of these patients ($n=18$; 62.1%) stated that they received medication for at least one of these disorders. Of those reporting at least one mental disorder, 79.3% ($n=23$) had previously received treatment services for their mental disorders.

Statistical analysis

Statistical analyses were performed using the software package PASW 18 (Released 2009, PASW Statistics for Windows, Version 18.0, SPSS Inc., Chicago, IL). An alpha level of 0.05 was used for all statistical tests. Descriptive analyses were performed to yield characteristics of the sample. Pearson's correlation coefficients were computed to analyze bivariate correlations between different variables of interest in the study. Paired proportions were compared using the McNemar exact conditional mid- p value, as recommended by Fagerland et al. (2013), to investigate if there were any significant differences between patient and treatment personnel reports.

Results

Roughly one-third of the patients ($n=29$; 34.1%) reported having one or more mental disorders; while treatment personnel reported that 41.2% ($n=35$) had one or more co-occurring mental disorders based on the classification criteria in ICD-10. To test if the differences between these reports were significant, a paired t -test was performed and was not significant; $t(84)=1.228$, $p>0.05$. Despite this lack of significance in overall rates, it seemed clinically meaningful to investigate if there were differences in some of the more specific. For example, personality disorders ($n=12$; 14.1%) were reported by treatment personnel as the most frequently occurring disorder, while patients' self-reports showed that anxiety disorders ($n=18$; 21.1%) and affective disorders ($n=18$; 21.1%) were the most prevalent psychiatric disorders. Table 2 provides further details of these results.

Further examination of the data showed that nine of the patients who reported having one or more mental disorders were reported by treatment personnel as not having a mental disorder. Moreover, treatment personnel reported one or more mental disorders in 15 patients whose self-reports indicated none. To test if these differences were significant the McNemar test was performed. The differences in the patient-reported and personnel-reported mental disorders were not significant ($p=0.23$). However, significant differences between treatment personnel and patients were found both between reported affective disorders ($p=0.05$) and personality disorders ($p=0.02$). There was only a non-significant tendency for such a difference with respect to anxiety disorders ($p=0.06$).

Just over half of the patients ($n=46$; 54.1%) reported using more than one substance ($M=2.26$, $SD=1.424$), and polysubstance use differed between substances. As shown in Table 2, patient-reported use of cannabis had strong correlations with the use of opioids ($r=0.549$; $p<0.01$), stimulants ($r=0.463$; $p<0.01$), sedatives ($r=0.365$; $p<0.01$) and other substances ($r=0.302$; $p<0.01$). Treatment personnel reported that 44% ($n=37$) had two or more substance use disorders. Strong correlations were also found between personnel-reported ICD-10 diagnoses. Alcohol use disorder was negatively correlated with substance use disorders due to use of opioids ($r=-0.212$; ns), cannabis ($r=-0.233$; $p<0.05$), stimulants ($r=-0.270$; $p<0.05$) and multiple drugs ($r=-0.346$; $p<0.01$). Cannabis use disorder was

Table 2. International Classification of Diseases-10 (ICD-10) diagnoses and self-reported psychiatric disorders ($N=85$).

Diagnosis	ICD-10 Diagnosis n (%)	Self-reported disorders n (%)
No psychiatric diagnosis	50 (58.8%)	56 (65.9%)
One or more psychiatric diagnoses	35 (41.2%)	29 (34.1%)
Affective disorders ^{a*}	10 (11.8%)	18 (21.2%)
Anxiety disorders ^b	11 (12.9%)	18 (21.2%)
Personality disorders ^{c*}	12 (14.1%)	4 (4.7%)
Other disorders ^d	11 (12.9%)	11 (12.9%)

^aF30–F39.

^bF40–F48.

^cF60–F69.

^dF20–F29, F50–F59, F70–F79, F90–98.

* $p<0.05$.

Table 3. International Classification of Diseases-10 (ICD-10) substances used and self-reported substances used ($N = 85$).

Substances used	ICD-10 <i>n</i> (%)	Self-report <i>n</i> (%)	Pearson correlation <i>r</i>
Alcohol	49 (57.6%)	59 (69.4%)	0.510**
Stimulants	30 (35.3%)	36 (42.4%)	0.662**
Opioids	14 (16.5%)	19 (22.4%)	0.663**
Sedatives	20 (23.5%)	26 (30.6%)	0.234*
Cannabis	23 (27.1%)	30 (35.3%)	0.437**
Other ^a	1 (1.2%)	12 (14.1%)	0.283**
Multiple drug use (only from ICD-10, not patients)	10 (11.8%)	–	–

^aThis variable is not comparable because patients could answer a category named other substances while ICD-10 codes were required of the treatment personnel.

* $p < 0.05$; ** $p < 0.01$.

positively correlated with disorders due to use of opioids ($r = 0.383$; $p < 0.01$), sedatives ($r = 0.474$; $p < 0.01$) and stimulants ($r = 0.492$; $p < 0.01$). Patient-reported substance use correlated significantly with the ICD-10 substance diagnoses reported by treatment personnel (Table 3). The highest agreements were between patient-reported use and personnel-reported disorders of alcohol ($r = 0.510$; $p < 0.01$), stimulants ($r = 0.662$; $p < 0.01$), opioids ($r = 0.663$; $p < 0.01$) and cannabis ($r = 0.437$; $p < 0.01$).

We also wanted to explore associations between ICD-10 psychiatric disorders and ICD-10 substance use disorders as reported by treatment personnel. Pearson's correlation coefficients showed that alcohol disorder was negatively correlated with personality disorders ($r = -0.266$; $p < 0.05$) and other ICD-10 disorders (e.g. schizophrenia spectrum, attention and conduct disorders; $r = -0.304$; $p < 0.01$), and that personality disorders were positively associated with ICD-10 multiple drug use disorder ($r = 0.271$; $p < 0.05$). Pearson's correlation coefficients between patient-reported mental disorders and substance use were also examined. The category "other mental disorders" (e.g. schizophrenia, eating disorders, attention and conduct disorders) correlated significantly with alcohol ($r = -0.277$; $p < 0.05$) and stimulants ($r = 0.237$; $p < 0.05$). No other significant correlations were found between patient-reported psychiatric disorders and substance use. There were, however, significant correlations between reported anxiety disorders and affective disorders ($r = 0.577$; $p < 0.01$), personality disorders ($r = 0.293$; $p < 0.01$) and other disorders ($r = 0.315$; $p < 0.01$).

The treatment personnel classified the severity of patients' mental health and substance use problems using the quadrant model. They classified 70.2% ($n = 59$) of the patients as having a high-severity level of substance use problems and a low-severity level of mental health problems. Approximately one-fifth of patients ($n = 18$; 21.4%) were classified as having a severe level of both mental health and substance use problems (Table 4).

Discussion

There seems to be a relatively high prevalence of co-occurring substance use disorders and mental health problems among patients in substance use disorder treatment. In this study the occurrence varied, with 34.1% of the patients

Table 4. Quadrant model, severity of mental health and substance use ($n = 84$).

		Substance use <i>n</i> (%)	
		Low	High
Mental health <i>n</i> (%)	High	3 (3.6)	18 (21.4)
	Low	4 (4.8)	59 (70.2)

reporting one or more psychiatric disorders and treatment personnel reporting 41.2% of patients with one or more psychiatric ICD-10 diagnoses. This is an overall difference of 7% between the two sources of information. It is also interesting to note that the personnel-reported number of psychiatric disorders was higher than the patient-reported number. In addition, nine patients reported that they had a psychiatric disorder while treatment personnel reported none for the same patients. In contrast, the treatment personnel reported that 15 patients had a psychiatric disorder whereas these same patients reported none. Despite a discrepancy in 24 patients this was not a statistically significant difference. However, in anxiety we found a tendency towards significance, and the differences were significant for reported affective and personality disorders. This difference may, nevertheless, have an important clinical significance for the individual patient. A recent study found that both patients and counsellors under-rated the patients' need for mental health services (Mericle et al., 2012). Of the patients who counsellors had under-rated, one-third indicated that obtaining treatment for mental health problems was important to them. Taken together with our findings, it seems likely that there is a discrepancy in perceived need for mental health treatment between patients and treatment personnel. However, patients and personnel do not seem to differ as much with regard to substance use. There were strong associations between patient-reported substance use and personnel-reported ICD-10 substance use disorders. This is in line with earlier research supporting the accuracy of self-reported substance use (Babor et al., 2000). The clinical significance of the discrepancy in patient self-reported mental disorders and personnel reported disorders is poorly defined. It implies that patients could be in need of psycho-education and a heightened awareness of their mental health status and how they should manage their mental health after discharge from treatment. Moreover, it could also be that treatment personnel over-report mental health problems among patients. Hence, it implies that treatment personnel need proper training and supervision to be able to identify mental health problems and help patients to receive needed care (Mericle et al., 2012).

Another important finding from the study is the high rate of having two or more problem substances, which was reported both by patients and personnel. Treatment personnel reported that 44% of the sample had two or more substance use disorders, while 54% of the patients reported having used two or more substances. Although having used a substance does not qualify as a diagnosable substance use disorder, the reports from treatment personnel and patients were similar and indicated that about half of the patients had severe use of more than one substance. To use several substances could make both the substance use and mental health problems

more complicated and severe. Alcohol was the least-used substance in combination with other substances. This is in line with earlier findings (Iversen et al., 2009). Patients reported that cannabis was the substance most frequently used in combination with other substances. It is important to identify polysubstance use because it could lead to challenges that should be targeted in treatment. Each of the substances used, and the use of substances in combination, could add to the severity of patients' problems. Treatment should target the difficulties and complexity that follow polysubstance use (Ives & Ghelani, 2006). This would better enable patients to cope with challenges without relapsing back to substance use after treatment discharge. Based on the high rate of co-occurrence of cannabis use in this study, a specific focus on cannabis used in combination with other substances may be an important aspect of treatment for substance use.

The quadrant model was applied in this study at an individual level in order to explore the personnel-reported mental health and substance use problems. The vast majority of the patients were classified as high in severity of substance use and low in severity of mental health problems. Furthermore, one in five patients was classified as having severe problems with respect to both substance use and mental health. This implies that substance use treatment should target both of these co-occurring problems. The most frequently occurring psychiatric disorders in combination with substance use disorders (as reported by both patients and treatment personnel) were anxiety, affective and personality disorders. It may be especially important to focus on these disorders in substance use treatment. Integrated substance abuse and mental health treatment seems to be more effective than non-integrated services (Brunette et al., 2004), and the quadrant model illustrates that a substantial minority of people in substance use treatment also have a level of mental health problems requiring integrated treatment (Keyser et al., 2008). Patients with high severity of substance use and low severity in mental health problems will typically be the responsibility of substance use disorder treatment, whereas those with high severity of mental health and low severity of substance use problems will generally be found in mental health treatment. The quadrant model appears to be a feasible instrument to categorize the severity level of co-occurring disorders. However, some generalized recommendations and definitions to guide the categorization should be used to ensure the reliability and the validity of the model (e.g. number and type of psychiatric disorders; number, type of substances used and how they are used). This categorization should also correspond to treatment settings and treatment, which should result in an improved care for patients with co-occurring disorders (Keyser et al., 2008).

Limitations and strengths

There are some limitations related to this study. First, data concerning psychiatric diagnosis were based upon the ICD-10 diagnoses in the patients' charts, as reported by treatment personnel, and self-reports from patients and were not collected through structured diagnostic interviews. This introduces several sources of bias, including that patients' charts often lack vital information about diagnosis and that

treatment personnel may have inaccurate memories about patients. In this study, patients and personnel differed in reporting depression and personality disorders, and there was a tendency towards a similar discrepancy for anxiety disorders. To ignore a possible difference between patient and treatment personnel reported anxiety could result in a conduct of a type II error. There are studies that compare self-reports with other sources of information and whether they give concurrent information (Bhandari & Wagner, 2006; Jackson et al., 2005; Killeen et al., 2004), have revealed inaccuracies in self-reported related to variables and issues perceived as stigmatization (Bhandari & Wagner, 2006; Killeen et al., 2004). Hence, more information is needed related to concurrent information about psychiatric diagnosis from patients and treatment personnel. An implication for further studies is that they should combine structured diagnostic interviews with reports from treatment personnel and patients. The combination of different sources could give specific information about multiple areas and would give strength to the research findings. Second, the study asked for psychiatric disorders related to the current situation and not for a lifetime history of psychiatric disorders. Third, our sample is relatively small. A larger sample could make the non-significant differences in reported overall psychiatric diagnosis to reach significance. Possible differences should therefore be tested further using a larger sample. Finally, because we were not able to compare study participants with study refusals, there is a possibility of a selection bias. In spite of these limitations, this study contributes results of greater importance and provides new information about the co-occurrence of substance use disorders and psychiatric diagnoses.

Conclusions

The results of this study showed a high prevalence of co-occurring mental health and substance use problems, and a greater awareness of this in substance use treatment is therefore important. However, there were differences between patient-reported and personnel-reported mental disorders in reported affective and personality disorders, and in anxiety we found a trend toward significance differences. Under-reporting or a poor recognition of mental disorders by treatment personnel and/or patients may have serious effects on treatment and treatment outcomes. Likewise, a possible bias could also be over-reporting of psychiatric diagnosis from treatment personnel. This highlights the necessity of improving understanding of mental disorders in addiction settings. Furthermore, researchers should be aware of possible biases when collecting information about certain areas; in terms of psychiatric problems, data could differ greatly depending on the source of the information. Thus, future research should aim to increase both the validity and reliability of reported mental health problems among patients with substance use disorders to ensure that patients' needs are adequately addressed. In terms of the quadrant model, in addition to being a framework which provides a structure for fostering consultation, collaboration and the integration of substance abuse and mental health treatment services, this study suggests that it is a feasible model and

promising tool for categorizing and targeting the treatment of co-occurring disorders.

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Declaration of interest

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