Patients in substance use disorder treatment: Motivation for behavioural change, co-occurring disorders and problem domains

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This thesis is based on data from a study on patients in treatment for substance use disorders in five different residential substance use disorder clinics and a group of patients in outpatient treatment in Central Norway (the counties of Nord-Trøndelag, Sør-Trøndelag and Møre og Romsdal). The study was funded by the Liaison Committee between the Central Norway Regional Health Authority (RHA) and the Norwegian University of Science and Technology (NTNU) in the period 2010-2013. The Research and Development department at Clinic of Substance Use and Addiction Medicine, St.Olavs University Hospital employed the author of this thesis.

This thesis: Patients in substance use disorder treatment: Motivation for behavioural change, co-occurring disorders and problem domains, have investigated clinical characteristics and patient factors associated with in-patient treatment for substance use disorders. The main aims of this thesis were to explore:

1. Whether the University of Rhode Island Change Assessment (URICA) was a suitable tool for measuring motivation and predicting change in substance use behaviour in patients entering substance use disorder treatment using the Readiness to Change (RTC) and Committed Action (CA) composite scores.

2. Whether the dimensional structure of Symptom Check List 90-Revised (SCL-90-R) and the Global Severity Index (GSI) scores discriminate between individuals subjects with substance use disorders and persons from the general population.

3. To understand the occurrence and the discrepancies of mental health problems and substance use disorders as reported by both patients and treatment personnel in addiction services, and to explore the feasibility of the quadrant model in understanding and addressing the severity of mental health and substance use comorbidity.

4. Treatment of patients in substance use disorder in-patient treatment. Were there differences regarding treatment interventions, which problem domains that were targeted, and patient’s perceived benefit among patients with and without co-occurring psychiatric disorders in substance use disorder in-patient treatment?

The thesis is based on four research articles published in peer-reviewed international journals (Journal of Substance Use, Journal of Dual Diagnosis and Addictive Disorders & Their Treatment). Some of the results in this thesis have been presented at local, regional and international conferences.
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Sammendrag

Hovedmålet med denne avhandlingen var å undersøke faktorer som er assosiert med pasienter i døgnbehandling for rusmiddelavhengighet og den behandlingen de mottar. Hovedfaktorene vi har sett på her er motivasjon som prediktor for endring i rusmiddelbruk, mental helse, forskjeller mellom selv-rapport og informasjon fra behandlingspersonale om rusbruk og diagnose på psykisk lidelse, mottatt hjelp med problemområder og behandlingsintervensjoner i rusmiddelbehandling, og til sist opplevd utbytte av behandlingen.

Det empiriske materialet i avhandlingen er basert på data fra to bekvemmelighetsutvalg innsamlet på rusbehandlingsinstitusjoner i Midt-Norge. Materialet fra det første utvalget (N = 95) er spørreskjemadata kombinert med deler av et strukturerert intervju av pasienter i det de skal inn i behandling. Disse data inkluderer også tre måneders oppfølging etter baseline. Det andre utvalget (N = 85) benytter et kryss-seksjonelt design med spørreskjema besvart av pasienter som er i ferd med å avslutte sitt døgnopphold i rusbehandlingsinstitusjoner, og behandler fra institusjonen. Data fra utvalg 1 er grunnlaget for artikkel I, mens data fra utvalg 2 er grunnlag for artikkel II-IV.

En kjent utfordring i behandling av rusmiddelavhengighet er at mange av pasientene har tilleggsproblematikk og komorbide lidelser. Motivasjon blir ofte sett på som en viktig faktor for om personer oppsøker og blir i behandling. I artikkel I benyttet vi instrumentet “University of Rhode Island Change Assessment (URICA)” for å undersøke om motivasjon predikerte om pasientene fortsatt var i behandling tre måneder etter baseline, eller hadde droppet ut. Motivasjon ble målt med to komposittskåer av URICA. Hvor klare pasientene var for endring ble målt med komposittskåren “Readiness To Change (RTC)”. Forpliktelse til endring ble målt med komposittskåren “Committed Action (CA)”. Vi fant ingen statistisk signifikant sammenheng mellom RTC og CA, og om pasientene var i behandling etter tre måneder. Vi konkluderte i dette studiet med at URICA som et mål på motivasjon for atferdsendring blant pasienter i rusbehandling bør benyttes med varsomhet.

Mange pasienter med en rusmiddelavhengighet har også samtidige psykiske lidelser. I artikkel II ønsket vi å undersøke om “Symptom Check List 90-Revised (SCL-90-R)” er egnet til å undersøke symptomomtrent som psykiske lidelser på pasienter inne til døgnbehandling på rusinstitusjoner. I vårt utvalg fant vi ikke støtte for den originale ni-faktorstrukturen i SCL-90-R. Det ser ut til at dette instrumentet er endimensjonalt og at anvendelsen av komposittskåren “Global Severity Index (GSI)” er en bedre egnet indeks i denne populasjonen. Gjennomsnittsskåren til GSI ble benyttet for å sammenligne om et utvalg av pasienter hadde mer problemer med sin mentale helse enn et utvalg fra den norske normalpopulasjonen. Vi fant at pasienter i ferd med å avslutte sitt behandlingsopphold hadde høyere gjennomsnittlig GSI-skåre enn utvalget fra normalpopulasjonen. Denne populasjonen pasienter hadde altså flere symptomer på psykiske lidelser. GSI-skårene var da også assosiert med selvrapporterte
psykiske lidelser og reseptbelagt medisinering for psykiske lidelser. Det siste støtter den diskriminante validiteten til GSI-indeksen.

Rapporter fra pasienter og behandlere om pasientens psykiske lidelser og rusbruk, og forskjeller i disse rapportene, ble undersøkt i artikkel III. Studiet viste at det var en diskrepans mellom rapportering fra pasient og behandlere på psykiske lidelser i 24 av 85 pasienter. Denne forskjellen var statistisk signifikant for affektive lidelser og personlighetsforstyrrelser. Vi fant ingen signifikante forskjeller mellom selvrapportert rusbruk og diagnoser på rusmiddelbruk rapportert fra behandlere. Behandlerne ble også bedt om å vurdere alvorlighetsgraden av pasientenes mentale helse og rusmiddelbruk ved å anvende Kvadrantmodellen. Denne modellen består av fire kvadrater hvor pasientene blir plassert avhengig av vurdert nivå (høyt eller lavt) av alvorlighetsgrad i rusbruk og mental helse. De fleste pasientene ble vurderet til å ha høy alvorlighetsgrad i rusmiddelbruk og lav i mental helse. En av fem pasienter ble imidlertid vurdert til å ha høy grad av alvorlighet i både rusmiddelbruk og mental helse.

Artikkel IV undersøkte hvilke intervensjoner pasienter i døgnbehandling for rusmiddelavhengighet mottok, hvilke problemområder de fikk hjelp med, og hvilke områder de følte at de fikk utbyte av behandling på. De mest vanlige behandlingsintervasjonene, rapportert av behandlerne, var intervensjoner som var rettet mot forbedring av forhold til familie og signifikante andre, avspenningsteknikker, psykodynamisk terapi, kognitiv atferdsterapi og motiverende intervju. Pasientene rapporterte å få mest hjelp med områder som forebygging av tilbakefall til rusbruk, fysisk helse, daglig fungering, forholdet til andre, psykiske helseproblemer og selvfølelse. Mest utbyte i behandling opplevde pasientene å få fra fysiske aktiviteter, støtte fra medpasienter, gruppeterapi, terapi, og vurdering og behandling av psykiske helseproblemer. Det var forskjeller mellom pasienter med og uten psykiske lidelser på flere mål. Pasienter med en psykisk lidelse mottok mer motiverende intervju og kognitiv atferdsterapi. Disse pasientene rapporterte at de fikk mer hjelp med selvfølelsen og håndtering av symptomer på psykiske lidelser, og de opplevde å få mer utbyte av behandling av den psykiske helsen, akutt hjelp, og hjelp med å håndtere sosiale situasjoner enn pasienter uten psykiske lidelser.

Funnene i denne avhandlingen støtter at flere psykologiske aspekter er viktig for å forstå og behandle rusmiddelavhengighet og samtidige psykiske helseproblemer. Blant de viktigste variablene er generell uro, psykisk og fysisk helse, og sosial støtte. Motivasjon er også sett på som viktig, men sammenhengen mellom motivasjon og endring av rustaferd fant vi ikke støtte for ved anvendelsen av URICA. Pasienter med samtidige psykiske lidelser mottok noe differensiell behandling.

Denne avhandlingen støtter viktigheten av behandling rettet mot flere områder som kan være problematiske for alle pasienter i behandling for rusmiddelavhengighet, samtidig som man gjør individuelle tilpasninger der det er nødvendig. Funnene vi har gjort støtter arbeidet med å implementere den nasjonale faglige retningslinje for utredning, behandling og oppfølgjing av personer med samtidig ruslidelse og psykisk lidelse.
SUMMARY

The main purpose of the present thesis was to investigate factors associated with individuals in substance use disorder in-patient treatment and the treatment they received. The chosen factors were motivation and its predictive abilities related to the change of substance use behaviour, mental health, differences between self-reports and reports from treatment personnel related to substance use and psychiatric disorders, help with problem domains and treatment interventions in substance use disorder treatment, and perceived benefit from treatment. The results from this thesis are based on two convenient samples from substance use disorder clinics in Central Norway. Sample 1 (N = 95) is a sample where data are collected through a survey combined with an interview of patients about to enter substance use disorder treatment, with a follow-up three months after baseline. Sample 2 (N = 85) is a sample where a cross-sectional survey was carried out among patients about to end their in-patient stay at substance use disorder clinic and their treatment personnel. Sample 1 was used in paper I, while paper II-IV applied sample 2.

Treating substance use disorder is challenging because patients often have many additional problems. Motivation is believed to be important to make individuals seek and stay in treatment. In paper I the University of Rhode Island Change Assessment (URICA) instrument was used to investigate whether motivation predicted if patients remained in treatment three months after baseline. The Readiness To Change (RTC) and Committed Action (CA) composite scores were used in order to explore this relation. The study did not find any evidence of a relationship between motivation measured with the use of RTC and CA and whether patients remained in treatment three months after baseline. The paper questions if the URICA instrument should be used as a measure of motivation among patients with substance use disorders.

Many patients with a substance use disorder have co-occurring mental health problems. The research reported in paper II explored whether the Symptom Check List 90-Revised (SCL-90-R) instrument was suitable for assessing this pattern of comorbidity. No evidence was found to support the original nine-factor structure of the SCL-90-R. The instrument appears to have a uni-dimensional structure and using the Global Severity Index (GSI) appears to be a reasonable solution. Mean GSI scores were also used to investigate whether patients had more mental health problems than a sample from the general population in Norway. Participants who were about to end an in-patient treatment stay for substance use disorders had higher mean GSI scores than the general population, indicating that there were more psychiatric symptoms in this clinical substance use sample. The scores of GSI was also associated with self-reported psychiatric disorders and prescribed medication for mental illness, which also supports the discriminant validity of GSI on the SCL-90-R.

Reports from patients and treatment personnel about psychiatric disorders and substance use and discrepancies between their reports were investigated in paper III. The study showed discrepancies between patients’ and treatment personnel’s assessments of patient’s mental health in 24 out of 85 patients. The discrepancy was statistically significant for affective and
personality disorders. There was no significant discrepancy found between self-reported substance use and substance use disorders reported from treatment personnel. The treatment personnel were also asked to assess the severity of all patients’ mental health and substance use problems using the quadrant model. This model consists of four quadrants where individuals are categorized depending on the considered level (high or low) of severity in substance use and mental health. Most patients were assessed as having severe substance use problems and less severe mental health problems. However, one in five patients had severe mental health problems in addition to severe substance use problems.

Paper IV explored the interventions used in in-patient treatment for substance use disorders, the problem domains for which patients received help, and in which problem domains they felt they had benefited from treatment. The most common interventions according to treatment personnel were interventions targeted to improve relationships with family and important others, applied relaxation techniques, psychodynamic therapy, cognitive behavioural therapy and motivational interviewing. Patients reported receiving most help in the domains of relapse prevention, physical health, daily functioning, relationships with others, psychological health and self-esteem. The patients reported benefiting most from physical activities, support from co-patients, group therapy, counseling, and assessment and treatment of psychological health problems. There were differences between patients with and without co-occurring disorders on several measures. Patients with co-occurring disorders were given more motivational interviewing and cognitive behavioural therapy interventions. They also reported receiving more help with their self-esteem and coping with psychiatric symptoms, and benefiting most from treatment of psychological health problems, acute help, and help with social situations than those without comorbid problems.

In summary, findings in this thesis support that several psychological aspects are important in understanding and treating substance use disorders and co-occurring mental health problems. Among the variables of importance are general distress, psychological and physical health, and social support. Motivation is also perceived to be of importance, but the relation between motivation and change in substance use behaviour got inconclusive support when assessed by the URICA in this thesis. Patients with co-occurring disorders received some differential treatment. This thesis supports the significance of targeting multiple problem domains to all patients, with individual adjustments when necessary. The findings from this thesis support the important of implementing the national guideline for assessment, treatment and rehabilitation of persons with co-occurring substance use disorders and psychiatric disorders.
1. INTRODUCTION

1.1 Substance use disorder

The rapid growth of lifestyle diseases is a worldwide challenge. The World Health Organisation (WHO; 2013) estimated that the annual number of deaths from non-communicable diseases will increase to 55 million per year by the year 2030. The four main behavioural risk factors for lifestyle diseases are tobacco use, unhealthy diet, physical inactivity and harmful substance use. The costs on the society for these illnesses are high, and so is the demand on the health care services.

1.1.1 The classification of substance use disorders

People who abuse one or more substances (alcohol or drugs) are at risk of developing several problems related to their misuse of these substances. There are two widely used diagnostic systems for psychiatric disorders. The International Classification of Diseases-10 (ICD-10) is a classification system of disorders developed by the WHO which is used worldwide. The Diagnostic and Statistical Manual of Mental Disorders- IV (DSM-IV) is a system developed and applied mainly in America (American Psychiatric Association, 1994). To be considered to have a psychiatric disorder, a person has to meet the criteria in the ICD-10 or the DSM-IV. In both systems the state of substance dependence is considered the most serious state. It is characterized by a heighten tolerance of the substance which means that the person craves larger doses of the substance to get the desired effect. The classification systems do, however, differ in some important aspects. What ICD-10 classifies as “harmful use” implies that the substance use is causing physical and/or mental harm to the individual (WHO, 1993). This definition includes use that cause serious harm for the individual without it necessary being dependent of the substances. DSM IV’s ”abuse of substances” implies a repeated use of substances with a maladaptive pattern, where the use has unfavourable consequences for the individual (American Psychiatric Association, 1994). Comparing ICD-10’s “harmful use” and DSM IV’s ”abuse” shows that DSM-IV require several social consequences to qualify for a diagnosis, while the physical and mental harm is important to qualify for a diagnosis according to ICD-10. Hence, the diagnosis of a substance use disorder in the two systems could be somewhat different, and these differences should be considered when comparing research using ICD-10 and DSM-IV.

In the fifth edition of the DSM “substance abuse” and “dependence” were combined into a single disorder named substance use disorder (American Psychiatric Association, 2013). Substance use disorder is measured from mild to severe to match the patients’ symptoms. There is little research on the differences between the terms abuse and dependence in DSM-IV and substance use disorder in DSM-V, and what (if any) impact the change has.

In the ICD-10, which is the classification system applied in Norway, substance use disorders are described in chapters F10 to F19, which cover mental and behavioural disorders due to psychoactive substance use (WHO, 1993). Substance use disorder diagnoses are divided into
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categories on the basis of the main substance involved: alcohol (F10), opioids (F11), cannabinoids (F12), sedatives or hypnotics (F13), cocaine (F14), stimulants (F15), hallucinogens (F16), tobacco (F17), volatile solvents (F18) or multiple drug use and use of other psychoactive substances (F19). In addition to these diagnostic categories, ICD-10 also categorises clinical states related to the use of substances: acute intoxication, harmful use, dependence syndrome, withdrawal state without or with delirium, psychotic disorder, amnesia, residual or late-onset psychotic disorder and other and unspecified mental and behavioural disorders. However, not all clinical states are applicable to all substances. According to ICD-10, dependence on a substance is manifested through a strong desire to use a substance, impaired control over substance use, physiological withdrawal when reducing substance use, tolerance to the effects of the substance, preoccupation with use of the substance and continuing to use the substance despite negative consequences (WHO, 1993). In addition, the level of dependence on the substance will influence the severity of the substance use disorder. The ICD-10 codes of harmful use and dependence of substances is included in the term substance use disorder. The severity of the substance use disorder will be influenced by the substance used, number of substances used and in which way they are used. Substances may be used in several ways; they may be ingested orally, smoked, sniffed or injected. The sensation and toxicity the user seeks will influence the choice of substance and method of use.

Dependence on one or several substances may influence an individual’s life in such a way that a change of the current state is inevitable. The psychosocial burden of substance use is high, and substance use is commonly associated with criminal activity, psychological and physical ill health, lack of education and work experience and lack of non-substance-using social contacts (Gossop et al., 1998; Ravndal & Lauritzen, 2004). The individual could have problems fulfilling their commitments to family, friends and employers. This may lead to trust being broken, damage to important relationships, and make holding down a job difficult. Getting high may assume priority in the life of a person misusing substances. All these negative factors will put a strain on the individual’s life. Individuals suffering from a substance use disorder will often need both treatment for the disorder and help to change their behaviour in order to cease being dependent on substances. A main goal of substance use treatment is therefore behavioural change, in order to bring about abstinence or a significant reduction in substance use.

1.2 Substance use disorder treatment

Traditionally, individuals with a substance use disorder were treated at residential treatment clinics. The clinics were specialised in treating either dependence of alcohol or narcotics. It was also common to treat women and men at separate clinics. Today, most substance use disorder clinics in Norway do not give treatment related to specific substances, but the same clinic treat dependences of alcohol, medications and illicit substances (Skretting, Lund & Bye, 2014). In-patient treatment is only used if out-patient treatment is not sufficient, and there are only a few clinics which are gender specific. Treatment of substance use disorders used to be the responsibility of the county the person lived in. In 2004 Norway introduced the Substance
Abuse Treatment Reform and moved responsibility for the treatment of individuals with substance use disorders from counties to specialist health care services (Ministry of Health and Care Services, 2004). The reform was intended to improve health care services for individuals with substance disorders, and gave these patients the same rights as other patients under the Patients' Rights Act (1999). The law gives individuals with substance use disorder the rights to have their need for treatment evaluated. If they have a need for substance use disorder treatment they shall receive treatment for their illness. Although the responsibility for treatment is given to the specialist health care services, the municipalities are responsible for following the patients before, during and after the treatment in the specialist health care.

In Norway the Health and Care Services Act (2011) regulates the circumstances under which a patient can be admitted to compulsory in-patient treatment. Compulsory treatment can only be used when patients are a danger to themselves (physically or mentally) from extensive substance abuse, treatment is considered necessary, voluntary measures are insufficient, and the action of detention is related to the need for help. However, most patients enter treatment for substance use disorders on a voluntary basis.

It is a goal to be able to treat the patient at the right level of care related to his or her needs. Substance use disorder can be treated in out-patient programmes, which are regarded as low-intensity treatment, or in-patient treatment programmes, which are regarded as high-intensity treatment. Patients’ treatment needs will be assessed and the level of care will be given accordingly to these needs (Norwegian Directorate of Health, 2007). Out-patient programmes are less resource demanding and will be preferred if the patients’ problems are perceived as less severe. Patients with severe problems related to substance use often have additional problems related to this misuse, and will often be in need for high-intensity treatment and hence enter residential treatment. In 2012, 6792 patients were in in-patient treatment and 19351 patients were in day and out-patient treatment related to substance use disorder in health care services in Norway (Skretting et al., 2014). In addition, some patients addicted to opioids could receive medical substitute treatment. The substitute treatment could be given at the same time as receiving out-patient or in-patient treatment. In 2012, the number of patients in substitution programs was around 7000 (Skretting et al., 2014). The typical patient in treatment for substance use disorder in Norway is a man of age between 31 and 50 year with a substance use disorder related to the use of alcohol or opiates (Iversen, Lauritzen, Skretting & Skutle, 2009; Norwegian Directorate of Health, 2011; Skretting et al., 2014). The distribution of ages in the patient group shows that about 50% of patients are between the ages of 30 and 50 years (Iversen et al, 2009; Norwegian Directorate of Health, 2011). In 2012 around 2800 patients in treatment for substance use disorder in psychiatric health care and interdisciplinary substance use treatment had an alcohol disorder as their main disorder, and around 4000 had drug or medication as their main substance use disorder (Skretting et al., 2014).

There is a gender imbalance in patients receiving substance use disorder treatment. About one third of the patients in residential substance use disorder treatment are women and two thirds are men (Norwegian Directorate of Health, 2011; Ravndal & Lauritzen, 2004; Skretting et al., 2014). In a psychiatric acute care unite in Central Norway the same imbalance among gender
and substance use diagnosis is found (Vaaler, Morken, Fløvig, Iversen & Linaker, 2006). Although there are more men than women seeking treatment for substance use disorders in all age groups, the proportion of women is higher in the younger age groups than in the older age groups (Norwegian Directorate of Health, 2011).

1.2.1 The biopsychosocial approach to substance use disorder treatment

The WHO (2008) has defined drug dependence as a biopsychosocial disorder, and the treatment model of substance use disorders in Norway is developed from the biopsychosocial approach. This model proposes that development of illnesses and diseases is influenced by biological, psychological and social factors (Engel, 1979). Almost all aspects of being human is by the model made relevant to the aetiology, progress and hence treatment of illnesses and diseases. It emphasises the importance of interactions among biological, psychological and social factors, and provides an alternative to the medical model of illness. The biopsychosocial model suggests that factors other than the biological and medical aspects of the illness should be targeted in substance use disorder treatment. When a patient with a substance use disorder enters treatment it is not sufficient to treat the medical problems related to their addiction. The course of substance use, like that of many other illnesses is influenced by many additional psychological and social factors that should be considered in the treatment process in order to be successful.

Hole (2014) proposes that the biopsychosocial approach can be applied to understand use, harmful use and dependence of substances. The transition from use to harmful use to dependence of substances can be understood through physical, psychological and social vulnerability. The biological aspect is what happens to the body physically when using substances. The experience of using substances is the psychological aspect. The social aspect is how the use of substances is influencing your life. Having a high vulnerability in one or several aspects could influence the individual’s risk of developing vulnerabilities in the other aspects in the model as well (Hole, 2014). This is one reason why it is important to focus on treating the “whole patient” in substance use disorder treatment.

The biopsychosocial model can also be used to integrate the patient’s perception of his or her illness into the treatment. Treatment personnel have to get to know and understand the patient and his or her values and norms, and distinguish between what the patient really needs and what the patient says he or she wants (Borrell-Carrió, Suchman & Epstein, 2004). Treatment facilities must strive to make individual adjustments so as to be able to provide each patient with the best possible treatment within the framework and tools to which they have access.

1.2.2 Motivation for changing substance use behaviour

Motivation plays an important role in acknowledging that one’s substance use is a problem, that one’s behaviour needs to change, and in seeking help to achieve and maintain behavioural change related to the substance use. The patient’s motivation to change substance use behaviour is important for change in both the cognitive domain (thoughts about change), and the behavioural domain (changing behaviour) (Ball et al., 2006; DiClemente, 1999; Goodman,
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Peterson-Badali, & Henderson, 2011). It has been proposed that motivation for behavioural change is an important factor in seeking and staying in substance use disorder treatment and that motivation to change is highly related to success in changing substance use behaviour (Ball, Carroll, Canning-Ball & Rounsaville, 2006; Simpson & Joe, 1993). Evidence suggests that to some extent, high motivation for change can even compensate for less effective treatment (Joe, Simpson, & Broome, 1998).

Motivation can derive from different sources. Intrinsic motivation is derived from within the individual, whereas extrinsic motivation is derived from sources such as family, significant others and environmental factors (DiClemente, 1999). The individual could be influenced by both forms for motivation when changing their behaviour. It has been proposed that there is a relationship between motivation and the intention and autonomy of behaviour. In the self-determination theory the locus of causality, internal or external, is an important factor for understanding motivation (Deci & Ryan, 1987; Ryan, Plant & O’Malley, 1995).

The Transtheoretical Model (TTM) of change has been developed to explain some of the association between motivation and behavioural change (Prochaska & DiClemente, 1983, 1992). This model is well known among people who are working with people having a substance use disorder in Norway. According to the TTM, behavioural changes occur in distinct stages. The TTM has been modified several times during recent years, but the model still proposes that behavioural change can be understood as a five stage process: precontemplation, contemplation, preparation, action and maintenance (see Prochaska & DiClemente, 1983, 1992 for a further description of these stages). According to the TTM, interventions should be tailored to fit the individual’s level of motivation and assess their readiness to change (Prochaska, DiClemente, & Norcross, 1992; Norcross, Krebs & Prochaska, 2010).

Several instruments have been developed for measuring motivation from the TTM and thereby inferring commitment to behavioural change (Carey, Purnine, Maisto, & Carey, 1999; McConnaughy, Prochaska, & Velicer, 1983; Miller & Toningan, 1996; Rollnick, Heather, Gold, & Hall, 1992). The University of Rhode Island Change Assessment (URICA; McConnaughy et al., 1983) has been used in several studies investigating motivation and different types of behavioural change related to different psychological problems with participants from Norway (Lerdal, et al., 2009; Coolidge et al., 2011; Vogel, Hansen, Stiles & Götestam, 2006). In the URICA the preparation stage has been taken out because of the questioned empirical validity of this stage (McConnaughy et al., 1983).

Relapse to substance use is common, and maintenance of the behaviour change is a continual process (Brownell, Marlatt, Lichtenstein & Wilson, 1986; DiClemente, Schlundt & Gemmel, 2004; Hunt, Barnett & Branch, 1971). It is often necessary for a patient to undergo treatment several times with different levels of care (Flynn & Brown, 2008). Although relapses and re-entrance to treatment are common in the treatment of substance use disorders it does not mean that treatment has failed. Treatment may have given patients knowledge and competence about their illness and coping tools to handle challenges that enable them to improve their quality of life. The relapse rates in drug dependence and chronic medical illnesses such as
type 2 diabetes, hypertension, and asthma are similar (McLellan, Lewis, O’Brien & Kleber, 2000). The treatment of chronic medical illnesses is seldom considered to have failed if a patient relapses back to old patterns of behaviour. Many factors influence the risk of relapse to substance use, co-occurring mental health problems are amongst the most important risk factors (Bradizza, Stasiewicz & Paas, 2006).

1.3 Co-occurring substance use and mental health disorders

In European countries about 27% of the population have experienced one or more psychiatric disorders during the last year (Wittchen & Jacobi, 2005). Studies of normal populations show that among the individuals that has substance use disorders 30-50 % also have co-occurring psychiatric disorders (Grant et al., 2004; Janè-Llopis & Matytsina, 2006; Kessler, Chiu, Demler & Walters, 2005; Regier et al., 1990). The presence of a psychiatric disorder is associated with increased risk of substance use, abuse or dependence (Flynn & Brown, 2008; Swendsen et al., 2010; Regier et al., 1990). Hence, the co-occurrence of psychiatric disorders is even higher among patients in substance use disorder treatment than in the normal population (Grant et al, 2004; Landheim, Bakken & Vaglum, 2002; Swendsen et al., 2010). The most common psychiatric disorders to co-occur with substance use disorders are anxiety, mood and personality disorders (Landheim, et al, 2002; Merikangas et al., 1998).

Four different models have been developed to understand the relationship between psychiatric disorders and substance use disorders (Mueser, Drake & Wallach, 1998). One model assumes that the substance use disorder came first and leads to a development of psychiatric disorder. A second explanation is that the psychiatric disorder leads the individual to substance use (e.g. self-medication). A third states that there are common factors that make the individual vulnerable to develop both psychiatric disorders and substance use disorders. The last model proposes that the increase in the rates of co-occurrence is a result of the interaction between the psychiatric disorders and the substance use disorders. It is still inconclusive which of these models best account for the relationship between the co-occurring disorders (Mueser et al., 1998).

There is a robust relationship between the severity of co-occurring psychiatric disorders and the severity of substance use disorder (Janè-Llopis & Matytsina, 2006; Merikangas et al., 1998). In Norway, about 40% of patients in substance use disorder treatment also receive psychiatric treatment from the psychiatric health care system (Norwegian Directorate of Health, 2011). It is common to categorise psychiatric disorders into severe and less severe disorders. In substance use disorder treatment patients most often have psychiatric disorders perceived as less severe such as mild to moderate mood and anxiety disorders, and some types of personality disorders (Norwegian Directorate of Health, 2012b). Substance use disorders differ in severity and the treatment should be approached in different ways and vary in intensity (out-patient, day care, in-patient, substitute treatment). Patients with severe substance use disorder and severe mental health problems who were treated in high intensity programs had better substance use outcomes and better mental health outcomes at follow-up than similar patients in low intensity programs (Chen, Barnett, Sempel, & Timko, 2006). It is important that treatment facilities for substance use disorder or mental health disorder screen
and make proper diagnostic assessments of patients’ mental health problems (Helseth et al., 2013). This helps to ensure that patients get treatment of the appropriate intensity and treatment for substance use disorders as well as psychiatric disorders.

Co-occurring disorders are often divided into independent and substance-induced disorders. Psychiatric disorders which are substance-induced are caused by the use of substances, whereas independent co-occurring psychiatric disorders are independent of the patient’s substance use. One study found that about 40% of the patients in an acute psychiatric unit had current substance-induced mood or psychotic disorders (Helseth, Samet, Johnsen, Bramnes & Waal, 2013). Another study found that current psychotic disorders were substance-induced in about one-third of the cases (Helseth et al., 2013). The rate of independent substance use disorders and mood and anxiety disorders is high, and the association between substance use disorder and independent mood and anxiety disorders implies that individuals with substance use disorders should also receive treatment for mood and anxiety disorders (Grant et al., 2004).

It is important to match a patient’s symptom severity to the level of treatment (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 which is used to differentiate between systems of care (Substance Abuse and Mental Health Services Administration, 2002). The idea of the model is that different degrees of co-occurring disorder warrant different treatment services (Mueser et al., 2006). The quadrant model is used to assess the severity of patients’ mental health and substance use problems. The quadrant model has four parts: Low severity of substance use and mental health (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).

Severe disorders like schizophrenia and bipolar disorder often co-occur with substance use disorder (Cuffel, 1996). It is unclear which factors can account for the high comorbidity between these disorders (Mueser et al., 1998; Strakowski & DelBello, 2000). About half the population of individuals with schizophrenia will develop a substance use disorder (Cuffel, 1996; Dixon, 1999). Comorbidity is even higher in individuals with bipolar disorder (Regier et al., 1990; Swendsen et al, 2010). It is also a high prevalence in first-episode psychosis and the misuse of substances (Addington & Addington, 2007; Barnett et al., 2007). Patients with a substance use disorders who use substances as a way to improve the symptoms of bipolar disorder may benefit from integrated treatment (Weiss et al., 2004). One Norwegian study suggested that at least two thirds of patients in substance use disorder treatment were in need of treatment for both psychiatric disorders and substance use disorders (Landheim et al., 2002).
INTRODUCTION

1.3.1 Screening tools and diagnostic instruments

When an individual enters substance use disorder treatment the nature of his or her illness and the most appropriate approach to treatment is often unclear. It has been suggested that patients with substance use disorders should be screened for psychiatric disorders using standardized diagnostic tools (Wynn, Landheim & Hoxmark, 2011). Assessment of psychiatric disorders using structured interviewing is often too resource- and time-consuming. Screening tools which are easier to use may help clinicians to detect psychiatric symptoms. Screening instruments are often used to reveal areas which require further investigation. Often several screening instruments are used to assess various psychological factors (e.g. motivation, psychological health, overall functioning, psychiatric symptoms etc.). It is important that these instruments are reliable and validated. Instruments with high reliability produce consistent measurements (Field, 2009), the validity of an instrument is the degree to which it measures what it is supposed to measure (Bordens & Abbott, 2002). When an instrument has both high reliability and validity users can be confident that it measures what it is supposed to and provides consistent results whenever and wherever it is used. Reliable and valid instruments for the assessment of psychiatric problems might be useful in revealing relevant comorbidity in the population of patients with substance use disorders.

1.4 Domains for help and treatment interventions for patients in substance use disorder treatment

Treatment success is often measured as the absence of substance use over a specific period after discharge (Brownell et al., 1986; Flynn & Brown, 2008; McGovern et al., 2005). As described earlier in this introduction, the risk of relapse to the use of substances is high. Relapse prevention is therefore a major part of substance use disorder treatment. Relapse to the use of substances is influenced by the interaction of personal, environmental and physiological factors (Brownell et al., 1986). This means that as well as targeting substance use behaviour directly, all the domains in which patients have problems should be targeted to prevent a relapse. Relevant domains may include relationships with family and friends, accommodation, financial situation, physical and psychological health, psychiatric history, motivation, self-esteem etc. (Miller et al., 2011). The patients have to manage the interactions among all these factors to maintain behavioural change and avoid relapse.

Several interventions, therapies and strategies may be used, often in combination, to treat patients with substance use disorder (Hole, 2014; Miller et al., 2011; Mueser, 2003). Typical components of treatment programmes for addiction and co-occurring disorders include motivational interviewing (Burke, Arkowitz & Menchola, 2003; Rubak, Sandbaek, Lauritzen & Christensen, 2005), cognitive behavioural therapy (Morgenstern, Morgan, McCrady, Keller & Carroll, 2001) and relapse prevention therapy (McGovern et al., 2005).
1.4.1 Patients with co-occurring psychiatric disorder and treatment need

Persons with substance use and comorbid psychiatric disorders tend to have a greater need for treatment (Mueser, Drake, Turner & McGovern, 2006). Poor outcomes associated with co-occurring disorders are often seen in areas like psychiatric symptoms, physical health and relapse to substance use (Gossop et al., 1998; Miller, Forcehimes & Zweben, 2011). For a person with substance use disorders’, having a psychiatric diagnosis is associated with an increased risk of relapse into substance use (Bradizza et al., 2006; Flynn & Brown, 2008; McGovern, Wrisley & Drake, 2005). The progression of both the mental health problems and substance use disorder is more severe when patients suffer from comorbid disorders (Mueser et al., 2006). Positive correlations have been found between substance abuse and psychiatric disorders in several studies, both related to the type of psychiatric disorder and to the severity of the disorders (Landheim, Bakken & Vaglum, 2006; Mueser et al., 2006; Merikangas et al., 1998). Severity of substance use seems to be associated with the severity of the psychiatric disorder.

Lack of knowledge may be an obstacle to the treatment of comorbid disorders in the substance use treatment field and the psychiatric treatment field. Patients’ need for mental health services could be underrated by both patients and treatment staff (Mericle, Martin, Carise & Love, 2012). In the substance use disorder field more knowledge and competence in dealing with psychiatric disorders as well as better collaboration between services is needed to optimise treatment of the substance use disorders. The complexity of co-occurring disorders requires that treatment clinics find treatment strategies which are appropriate to the different needs of different patients (Flynn & Brown, 2008). An accurate assessment of patient needs is critical to the provision of appropriate treatment (Hohman & Loughran, 2013).

Because patients with co-occurring disorders usually report problems in more domains than patients without psychiatric disorders, they have more need for an integrated approach to treatment that focuses on several problems at the same time (Mueser et al., 2006). Some differences in mental health, psychological factors and overall functioning should be expected between patients with substance use disorder only and those with co-occurring disorders. Integrated treatment is considered optimal for patients with co-occurring disorders (Mueser, 2003). Integrated treatment involves treatment of the substance use disorder and the psychiatric illnesses at the same time and from the same treatment team (Mueser, 2003). This kind of treatment requires that the personnel in substance use disorder treatment clinics have knowledge of psychiatric disorders and are competent to treat these disorders. Findings from several studies suggest that patients with co-occurring disorders need treatment which is both directed towards their substance use disorder and their mental problems, in order to help the patient in a best possible way (Flynn & Brown, 2008; Grant et al., 2004; Landheim et al., 2002).
INTRODUCTION

1.5 The aims of the thesis

As the introduction shows, substance use disorder is a complex illness which is influenced by many factors. Norway has elaborated reforms and national guidelines intended to improve assessment, treatment and rehabilitation of individuals with substance use disorders (Ministry of Health and Care Services, 2004; Norwegian Directorate of Health, 2007; 2014; 2011; 2012a, b). There is still a lack of knowledge about the substance use disorder in-patient population and the treatment given. Is there coherence between what is proposed to be important variables in treatment and the treatment actually given to the patients? Co-occurring psychiatric illness is one important factor that can make substance use disorder more severe and the process of achieving behavioural change from substance use more complex. Although there are several national and international studies documenting prevalence of co-occurring substance use disorders and mental health problems (Flynn & Brown, 2008; Hoxmark et al., 2010; Landheim et al, 2002; Mueser et al, 2006; Merikangas et al., 1998) we lacked knowledge on this co-occurrence in Central Norway. What demands do comorbidity put on treatment, and how are they addressed by the treatment clinics in Central Norway? Mental health problems are more prevalent in individuals with substance use disorders than in the general population (Grant et al, 2004; Swendsen et al., 2010). The heightened prevalence indicates that there is a need for extra attention on patients’ mental health in substance use disorder treatment. It also appears that behavioural change is difficult if the patient is not motivated to change behaviour. This thesis investigated factors associated with treatment of substance use disorders. Important factors which were explored were measurement of motivation and the extent to which measures of motivation predicted if patients stayed in substance use disorder treatment, reports of mental health, differences between self-reports and reports from treatment personnel, substance use disorders, help with problem domains and interventions in treatment and perceived benefit of the treatment.

This has resulted in four main aims of the thesis:

1. Whether the University of Rhode Island Change Assessment (URICA) was a suitable tool for measuring motivation and predicting change in substance use behaviour in patients entering substance use disorder treatment using the Readiness to Change (RTC) and Committed Action (CA) composite scores.

2. Whether the dimensional structure of Symptom Check List 90-Revised (SCL-90-R) and the Global Severity Index (GSI) scores discriminate between individuals subjects with substance use disorders and persons from the general population.

3. To understand the occurrence and the discrepancies of mental health problems and substance use disorders as reported by both patients and treatment personnel in addiction services, and to explore the feasibility of the quadrant model in for understanding and addressing the severity of mental health and substance use comorbidity.
4. To explore treatment of patients in substance use disorder in-patient treatment. Were there differences regarding treatment interventions, which problem domains that were targeted, and patient’s perceived benefit among patients with and without co-occurring psychiatric disorders in substance use disorder in-patient treatment?
2. METHOD

2.1 Samples

The papers on which this thesis is based used data collected from two samples. Data from the first sample was used in paper I and data from the second sample was used in papers II-IV. Both samples had patients from residential clinic 1, 2, 3, 4 and 5, in addition had sample 1 some patients from out-patient treatment programs. Clinic 4 and 5 were clinics following a therapeutic community model, while clinic 1, 2 and 3 were short-term clinics not following a special model but implementing treatment advices from relevant Norwegian guidelines. Clinic 1 and 2 had gender specific units. A more detailed description of these patient samples is given below.

Sample 1
This sample consisted of patients from substance use disorder treatment clinics in Central Norway. Data were collected in the period June 2010 to January 2012. This sample was recruited using a convenience sampling procedure, and were patients recruited as they were to enter substance use disorder treatment. The inclusion criteria for this study (paper I) were that participants had to be over 18 years of age, show sufficient stability in psychological symptoms and a regulated substance intoxication, hence to be able to give an informed consent to participate. In addition, they also had to meet the ICD-10 criteria for substance use disorder.

Most of these patients were interviewed by the same person who recruited them to the study. After consenting to participate a time for the interview was set. After an initial assessment interview (American Society of Addiction Medicine Patient Placement Criteria - second revised version, ASAM PPC-2R) on entering treatment, the participants were given a self-report questionnaire containing the 32-item URICA instrument. After three months they were called in for a follow-up assessment with a second interview (ASAM PPC-2R) and the URICA instrument. An individual case-report form was created which contained information on treatment placement.
Table 1: Sample 1

<table>
<thead>
<tr>
<th>Clinics</th>
<th>N (N=95)</th>
<th>Women (n=32)</th>
<th>Men (n=63)</th>
<th>Age M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Clinic 1</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>37.2 (13.4)</td>
</tr>
<tr>
<td>Residential Clinic 2</td>
<td>16</td>
<td>4</td>
<td>12</td>
<td>40.0 (9.8)</td>
</tr>
<tr>
<td>Residential Clinic 3</td>
<td>33</td>
<td>12</td>
<td>21</td>
<td>30.2 (8.7)</td>
</tr>
<tr>
<td>Residential Clinic 4</td>
<td>19</td>
<td>7</td>
<td>12</td>
<td>30.0 (8.2)</td>
</tr>
<tr>
<td>Residential Clinic 5</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>33.8 (10.6)</td>
</tr>
<tr>
<td>Out-patient treatment</td>
<td>17</td>
<td>3</td>
<td>14</td>
<td>36.2 (9.4)</td>
</tr>
</tbody>
</table>

A total of 112 patients were asked to participate in this study, 95 patients consented to do so, see table 1. Of the consenting patients 17.9 % (n=17) patients were entering out-patient treatment for substance use disorder. Patients entering treatment at residential clinic 4 and 5 (n= 23, 24.2%) were about to receive treatment at clinics following a therapeutic community model. 55 patients (57.9%) were to enter short-term clinics not following a special model but implementing treatment advices from relevant Norwegian guidelines and 17 patients (17.9%) were to start with out-patient treatment. Which clinics patients were to enter and the type of treatment model were not included in the further analysis. Of the sample 66.3% (n = 63) were men and 33.7% (n = 32) were women. The distribution of gender in the sample resembles the population of individuals with substance use disorder (see Iversen, Lauritzen, Skretting, & Skutle, 2009). Age ranged from 18 to 62 years (M= 34.45, SD = 9.89). In this sample the main substance used was stimulating drugs (33.0%), alcohol (21.4%), heroin (15.2%), opioids/painkillers (12.5%), sleeping medicine/sedatives (8.9%), cannabis (7.1%) or other (0.9%). The use of stimulating drugs as their main drug is somewhat high, but is coherent with a finding from another patient sample from Central Norway (e.g. Nordfjærn, 2011). In all, 74.4% of the sample had previously been in contact with addiction treatment facilities for their substance use problems. The number of treatment contacts with addiction treatment facilities ranged from zero to 20 (M = 1.75, SD = 2.52). The number of contacts with in-patient psychiatric treatment facilities ranged from zero to 30 (M = 2.17, SD = 4.85), while the number of out-patient contacts with psychiatric treatment facilities ranged from zero to 10 (M = 1.64, SD = 2.18). In all, 83% of the sample reported having one or more psychiatric diagnoses. At the follow-up assessments, 41 participants completed the URICA, giving a drop-out rate of 56.8%. The distribution of age and gender in participants who completed the follow-up assessment was similar to that of the sample at baseline.
METHOD

Sample 2
The second sample consisted of patients and treatment personnel from different substance use disorder residential treatment clinics in Central Norway. Data were collected between May 2011 and May 2012. Consent forms and the book with the codes which linked the various data on a given patient were stored in the clinics. It was the staff at each residential clinic that was responsible for recruiting patients to the study. The included clinics were spread over a large geographical area which made it impossible for the researcher to do the recruiting. This also made the participants anonymous to the researcher. The researcher organized training of treatment personnel from all clinics teaching them the electronic questionnaires and the recruiting process. The researcher also had close contact with a contact person for the study on each clinic reminding them about recruiting patients and offering support and guidance when needed. Neither treatment personnel nor patients had access to each other’s responses. All questionnaires were submitted electronically ensuring that the patient were anonymous for the research team.

This sample also used a convenient sample procedure, and recruited patients as they entered the in-patient treatment clinics. Of the patients were 15 (17.6%) about to end their treatment stay from clinics perceived as giving long-term treatment following a therapeutic community model. The 70 other patients (82.4%) were from short-term clinics not following a special model but implementing advices from relevant Norwegian treatment guidelines. The inclusion criteria for the study (papers II-IV) were that participants had to be over 18 years of age and receiving treatment for substance use disorders at a residential clinic. Written informed consent was obtained after eligible participants had been given a complete description of the study. Respondents who consented to participate answered an electronic questionnaire during their last week of treatment at the in-patient clinic. The patients were also asked to consent to treatment personnel completing a questionnaire about their treatment. Pairs of questionnaires were identified by a code which made it possible to link them together for data analyses.

Table 2: Sample 2

<table>
<thead>
<tr>
<th>Clinics</th>
<th>N</th>
<th>Women</th>
<th>Men</th>
<th>Age</th>
<th>Patients with psychiatric disorders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential Clinic 1</td>
<td>50</td>
<td>10</td>
<td>40</td>
<td>43.1 (10.6)</td>
<td>16</td>
</tr>
<tr>
<td>Residential Clinic 2</td>
<td>9</td>
<td>5</td>
<td>4</td>
<td>43.3 (3.6)</td>
<td>3</td>
</tr>
<tr>
<td>Residential Clinic 3</td>
<td>16</td>
<td>4</td>
<td>12</td>
<td>27.2 (3.8)</td>
<td>8</td>
</tr>
<tr>
<td>Residential Clinic 4</td>
<td>8</td>
<td>2</td>
<td>6</td>
<td>30.3 (4.9)</td>
<td>7</td>
</tr>
<tr>
<td>Residential Clinic 5</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>23 (.00)</td>
<td>1</td>
</tr>
</tbody>
</table>

28
In total, 119 patients consented to participate in this study, see Table 2. The number of patients who were approached and asked to participate is unknown. The patient questionnaire was completed by 85 patients. The gender distribution of the sample was 25.9% women (n = 22) and 74.1% men (n = 63). The age range of the sample was 20 to 72 years (M = 38.3, SD = 11.8). Clinic 1 recruited 50 patients to the study. Of these, alcohol was the main substance of choice for 34 patients (68%). The substances reported by all patients as their main substance of choice were alcohol (44.7%), stimulants (29.4%), heroin (10.6%), sleep medicine/sedatives (7.1%), cannabis (5.9%) or other substances (2.4%). These substances were ingested orally (50.6%), injected (25.9%), sniffed (15.3%) or smoked (8.2%). Over half of the sample reported using more than one substance (54.1%). Most patients had a two months (median = 2, interquartile range = 2-3.25, Mann-Whitney U: \( p = .009 \)) long residential treatment stay.

About one-third (n = 29, 34.1%) of the patients reported having one or more psychiatric disorders. Over half of these patients (62.1%) stated that they received medication for at least one of these disorders and about one third of the whole patient group (29.4%) reported that they were currently used prescribed medication for a mental illness. Of those reporting at least one mental disorder, 79.3% had previously received treatment for psychiatric problems. According to patient self-reports, anxiety disorders (21.1%) and affective disorders (21.1%) were the most prevalent psychiatric disorders. Personality disorders were reported by 4.7% of the patients and 12.9% reported having other psychiatric disorders which were not related to anxiety, affective or personality disorders.

The treatment personnel answering the questionnaire about the patients were mostly nurses, psychologists, child welfare officers, social workers and social educators. A more accurate description of the treatment personnel in the clinics is difficult because it is difficult to identify the individual treatment personnel, they could have had more than one patient which were included in the study and hence answered more than one questionnaire. The treatment personnel reported that 41.2% (n = 35) of the sample had one or more co-occurring mental disorders based on the ICD-10 classification in their charts. According to the treatment personnel, personality disorders (14.1%) were the most frequently occurring disorder followed by anxiety disorders (12.9%) and affective disorders (11.8%).

2.2 Instruments

The University of Rhode Island Change Assessment (URICA; McConnaughy et al., 1983) is a 32-item self-report instrument which was created to measure individuals’ motivation and readiness for change. The questionnaire is made up of statements that respondents have to respond to using a five-point Likert scale, where a score of one indicates strong disagreement and five indicates strong agreement with the statements. The statements in the URICA do not specify the problem to which respondents assess their motivation for change, but patients in the current study were instructed to relate answers to their substance use problems. This instrument was used in paper I.
METHOD

The Symptom Check List 90-Revised (SCL-90-R, Derogatis, 1994) contains 90 self-report items measuring psychiatric distress. The items are rated on a five-point scale ranging from 0 (not at all) to 4 (extremely) indicating the degree of distress in the last seven days. The SCL-90-R is a revised version of SCL-90, but only three items have been changed from the original version, so comparison of results obtained using different versions remains possible (Vassend, Lian & Andersen, 1992). There are three global indexes derived from the SCL-90-R: Global Severity Index (GSI), Positive Symptom Distress Index (PSDI) and the Positive Symptom Total (PST). GSI is the only index applied in this thesis, which is calculated by summarizing the mean value of the nine symptom dimensions and the seven additional items divided by the total number of responded items. The SCL-90-R instrument was used in paper II.

American Society of Addiction Medicine Patient Placement Criteria - second revised version (ASAM PPC-2R; Angarita, et al., 2007) is a structured interview. Some questions from this interview were used in the research reported in paper I, it was supplemented with a questionnaire which assessed patients’ motivation for behavioural change using the URICA. Data retrieved from the ASAM PPC-2R interview which was used included questions on psychiatric diagnoses and main drug of choice. The interviewer also evaluated the patient’s ready/willingness to change and the need for treatment. Ready/ willingness to change were measured on a five-point Likert scale, where a score of one indicated active participation and appropriate concern with their problem and five indicated a wish to avoid treatment or failure to acknowledge their substance addiction or misuse problem. Patients were also assessed and scored on their need for treatment, where a score of one means that treatment is necessary and five that without treatment the patient’s life would be in danger.

2.3 Questionnaires for patients and treatment personnel

These questionnaires were developed by the author of this thesis and the author’s supervisors and were used in papers II-IV. These questionnaires are not validated earlier, but constructed and adjusted for this study. The items in the questionnaires were selected on the basis of empirical findings related to the research questions and the aims of the thesis. Patients answered a questionnaire asking about demographic factors, substance use, mental health and treatment related to these problems. Respondents were asked about their current in-patient treatment programme, including questions about the domains in which they had received help during their stay, perceived benefits of the different elements of their treatment and how satisfied they were with their treatment. All these variables were measured on a five-point Likert scale ranging from 1 (very little) to 5 (very much). Questions about substance use were related to the main substance used and to other substances. Participants were asked if they had any psychiatric diagnoses, and they were asked to select those which applied from a list. Finally, the questionnaire asked about their previous and current treatment for substance use and mental health disorders.

Treatment personnel completed a separate questionnaire relating to substance use, mental health and treatment services given to the patient for each patient. In this thesis all patients is placed into a quadrant applying the quadrant model, not just patients with a psychiatric
diagnosis. Earlier research of the model is done on co-occurring disorder treatment units, hence it has only included patients with co-occurring disorders (e.g. McGovern, Clark & Samnaliev, 2007). Treatment personnel were instructed to rate the patients severity when entering treatment, in mental health and substance use problems, according to the quadrants on the basis of their experience of treating people with substance use disorders and their knowledge of the individual patient (e.g. substance use disorders, mental health problems, medication, previous treatment etc.). In addition, they were also asked to report the ICD-10 diagnoses from the patient’s chart. ICD-10 diagnoses were reported in two categories in the questionnaire: psychiatric diagnoses (ICD-10 codes not due to substance use) and substance use diagnoses. This classification is used throughout the rest of this thesis. Up to five diagnoses could be reported in each category and the diagnoses were further categorised by the author of this thesis. In this thesis psychiatric disorder is classified through the ICD-10 codes and includes schizophrenia and other psychotic disorders (F20-29), affective disorders (F30-39), anxiety disorders (F40-49), behavioural syndromes associated with physiological disturbances and physical factors (F50-F59), personality and behaviour disorders (F60-F69), mental retardation (F70-F79), and behavioural and emotional disorders with onset usually occurring in childhood and adolescence (F90-F98). The specific ICD-10 codes for psychiatric diagnosis were not applied in this thesis; hence the specific disorder is classified into groups of disorders, e.g. affective disorders, anxiety disorders, personality disorders and other disorders.

2.4 Ethical considerations

In all of the studies, patients gave informed consent for participation. The studies in this thesis were conducted in accordance with the Declaration of Helsinki and approved by the Regional Committee for Medical and Health Research Ethics in Central Norway. An ethical evaluation of the study protocol was completed and the value of the studies was considered to be higher than the potential cost to the patients of participation. The patients were informed that the responses would be interpreted, analysed and published anonymously. They were also informed that they could withdraw their consent to participate and demand that their responses be deleted. The author of the thesis was responsible for ensuring that data from the patients, treatment personnel and treatment clinics was handled ethically when interpreting the data and publishing the results.

2.5 Statistical analysis

All the statistical analyses in the papers were performed with the statistical software packages PASW 18 or AMOS 20 and a conventional significance level of $p < .05$ was used. Descriptive analyses were performed to indicate the general characteristics of the samples. Pearson correlation coefficients were computed to obtain bivariate correlations between different variables of interest in all the papers.

In paper I the original factorial structure of the URICA was explored using confirmative factor analysis (CFA). The Comparative Fit Index (CFI) and the Root Mean Square Error of
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Approximation (RMSEA) were calculated to investigate the fit of the models. The CFI should have values over .95 and RMSEA values should be no higher than .10, ideally around .05 (Blunch, 2008). The internal consistency of the URICA was examined by computing Cronbach’s alphas and average-corrected item-total correlations. RTC scores were computed by adding the mean scores on the precontemplation, action and maintenance subscales together and then subtracting this total from the mean score on the precontemplation subscale. RTC scores ranged from -2 to +14. CA scores were computed by subtracting the mean score on the contemplation stage from the mean score of the action stage. CA scores ranged from -4 to +4. High RTC and CA scores indicate respectively that the patient is ready to change and committed to act. A paired sample t-test was performed on RTC and CA scores from the baseline and the three-month follow-up assessments to see if the mean scores had changed during this time.

Paper II tested the theoretical uni-dimensional structure of SCL-90-R using Principal Component Analysis (PCA). CFA was performed to assess the dimensionality of the SCL-90-R and to test in further detail if a one-factor model provided an acceptable fit to the empirical data. The CFI, Goodness of Fit Index (GFI) and the Root Mean-square Residual (RMR) were calculated. A good model-data fit is indicated by a GFI close to 1 and an RMR below .05 (Blunch, 2008). The internal consistency of the SCL-90-R was examined by computing Cronbach’s alphas and average-corrected item-total correlations. Corrected item-total correlations above .30 and Cronbach’s alpha above .70 are considered satisfactory (Tabachnick & Fidell, 2007). A two-tailed independent samples t-test was used to determine whether there was a difference between the GSI scores of the patients with substance use disorder sample and a sample of the general population in Norway who were selected as a normative comparison group (GSI score obtained from Vassend et al., 1992). Cohen’s d was used to provide measures of effect size for the difference in means. A Cohen’s d of 0.20 indicates a small difference, a d-value of 0.50 indicates a medium difference and 0.80 is a large difference (Cohen, 1988).

The McNemar test was used in the analysis reported in paper III. Paired proportions were compared using the McNemar exact conditional mid-p-value, as recommended by Fagerland, Lydersen and Laake (2013). This was done to investigate potential differences between patient and treatment personnel reports of psychiatric diagnoses.

In paper IV Pearson’s chi-square tests were carried out to investigate differences between patients with substance use disorders only and those with co-occurring disorders. Time period in treatment were calculated by the use of median (mdn) and interquartile range (IQR). The difference in duration of in-patient treatment between patients with co-occurring disorders and patients with substance use disorders only was investigated using the Mann-Whitney U test ($p = .009$).
3. RESULTS


The research reported in paper I investigated whether the URICA was a suitable tool for the measurement of motivation for behavioural change in patients entering substance use disorder treatment. We investigated whether the RTC and CA composite scores derived from the URICA predicted whether patients would still be in treatment three months after entry. Paper I reports the analysis of sample 1, with a sample size of 95 at baseline and 41 patients at follow-up (see Section 2.1.1 for more information about the sample).

CFA showed that the original factor structure had a low to barely acceptable fit. Reliability scores were also computed for all four dimensions on the URICA. The pre-contemplation stage had the lowest mean value. The highest scores were obtained on items for the contemplation and action stages.

The RTC (-2 to +14) and CA (-4 to +4) are based on mean scores, see Section 2.6 for more information. At baseline the mean RTC score was 7.88 (SD = .97). RTC correlated negatively with the precontemplation score (r = -.244, p < .05) and positively with the scores for contemplation (r = .651, p < .01), action (r = .837, p < .01) and maintenance (r = .900, p < .01). The mean CA composite score was -.02 (SD = .39) and CA score correlated significantly with the stages of contemplation (r = -.395, p < .01) and action (r = .397, p < .01). There was also a small but significant correlation between CA and RTC (r = .236, p < .05). At follow-up, the mean RTC score was 10.19 (SD = 2.56) and the mean score was .59 (SD = .47). The composite scores at follow-up correlated significantly with the scores at baseline (RTC: r = .612, p < .01; CA: r = .504, p < .01).

The RTC and CA scores at follow-up did not correlate significantly, unlike at baseline. A paired sample t-test was therefore performed to explore potential changes in RTC and CA mean scores between the baseline and follow-up assessments. There were significant changes in RTC (t(39) = -7.246, p < .01) and CA (t(39) = -8.412, p < .01) and the values of Cohen’s d indicated that these differences were large for both RTC (d = -1.165) and CA (d = -1.396) scores.

The association between interviewer assessments of ready/willingness to change and need for treatment, and associations between demographic variables collected during the interview and RTC and CA were also investigated (for more information about variables in the interview see Section 2.3). The mean ready/willingness to change score was 1.67 (SD = .87), whereas the means score for interviewer assessment of need for treatment was 3.75 (SD = .85). There were no significant correlations between RTC and the variables from the interview at baseline.

There is a need for further investigation of instruments measuring motivation for behavioural change in patients’ with substance use disorders. We found no evidence that RTC and CA
results scores on treatment entry predicted if patients remain in treatment three months later. There was almost no relationship between the scores from the URICA indices and demographic variables or the interview variables. These results indicate that the URICA instrument has low predictive validity for measurement of motivation to change substance use behaviour and should be used with caution.
3.2 Paper II: The dimensional structure of SCL-90-R in a sample of patients with substance use disorders.

The aims of paper II were to explore the dimensional structure of the SCL-90-R among inpatients with substance use disorders and examine whether mean GSI scores discriminated between patients with substance use disorders and a general Norwegian population sample. The mean GSI score of the normal population sample (M = .37, SD = .39) are derived from Vassend and colleagues (1992). The concurrent validity of the SCL-90-R was also examined in the paper. This research reported in paper II was carried out with sample 2 (see Section 2.1.2 for more information about the sample).

A high proportion of the variance was explained by one factor (34.13%). Second, a Varimax rotated factorial structure showed that several of the factors of SCL-90-R had relatively high dual loadings (> .30). Third, a visual inspection of the scree plot showed that the SCL 90-R instrument segmented into one dominant factor. One factor from the sum scores of the nine dimensions and the additional configural items explained 66.58% of the total variance in scores. Several of the dimensions had correlations over .70 indicating that there may be collinearity problems with the nine dimensional structure. Both PCA and CFA showed that a model of the SCL-90-R with a uni-dimensional structure could not be rejected.

Reliability indices and corrected item-total correlations were computed for all the nine dimensions and the additional configural items. The reliability indices showed that all the nine dimensions of SCL-90-R had satisfactory corrected item-total correlations and Cronbach’s alphas. Cronbach’s alphas were also calculated for both GSI score (α = .935) and SCL-90-R with all 90 items (α = .942). Both indices had high reliability and very good average-corrected item-total correlations.

The GSI scores in the patient sample ranged from .02 to 2.28, the mean GSI score was .66 with a standard deviation of .52. The t-test showed significant differences between the current patient sample and the Norwegian general population sample (t(1151) = 6.418, p < 0.001). The value of Cohen’s d indicated that this difference was modest (d = .378). The substance use disorder in-patient sample had significantly higher mean scores on the GSI than the general Norwegian population. This provides support for the discriminant validity of the SCL-90-R.

A significant positive correlation between the GSI and patients’ self-reported earlier treatment contact with psychiatric facilities (residential clinic, acute hospital care and out-patient clinics) was revealed by the analysis (r = .240, p < .05). There was also a significant positive correlation between the GSI and self-reported psychiatric diagnosis (r = .367, p < .01). Reported affective disorders (r = .468, p < .01), anxiety disorders (r = .327, p < .01) and personality disorders (r = .288, p < .01) correlated significantly with the GSI. Some of this patient sample were also prescribed medication for a psychiatric illness and having a prescription for medication was positively correlated with the GSI (r = .288, p < .01).
RESULTS

The SCL-90-R appears to be an appropriate tool for measurement of general distress among patients in substance use disorder treatment. This study showed that SCL-90-R is unidimensional and the case for use of the previously established factor structure is debatable. The GSI may be a viable alternative. Patients had higher GSI scores than a sample from the general population. This is consistent with the prevalence of co-occurring psychiatric symptoms in the general population and patients in substance use disorder treatment (Grant et al, 2004; Swendsen et al., 2010). The concurrent validity of the SCL-90-R and GSI was satisfactory. The SCL-90-R could feasibly be used as an instrument for screening for general distress and as an aid to the assessment process which would provide an indication of need for a more thorough structured interview to diagnose psychiatric disorders.
3.3 Paper III: Mental health and substance use problems among patients in substance use disorder treatment as reported by patients versus treatment personnel

The primary aim of the research reported in paper III was to examine and compare patients’ and treatment personnel’s reports of mental health and substance use problems among patients in substance use disorder treatment. Although the prevalence of co-occurring disorders is well documented (Flynn & Brown, 2008; Landheim et al, 2002; Mueser et al, 2006; Merikangas et al., 1998) a comparison of reported prevalence of various disorders was considered interesting. In addition we explored the feasibility of having treatment personnel use the quadrant model to assess the severity of mental health and substance use disorders. The research reported in this paper was carried out with sample 2 (see Section 2.1.2 for more information about the sample).

Roughly one third of the patients (n = 29; 34.1%) self-reported having one or more psychiatric disorders whereas treatment personnel reported that 41.2% (n = 35) of the patients had one or more co-occurring psychiatric disorders based on the classification criteria in ICD-10. Treatment personnel reported that personality disorders (n = 12; 14.1%) was the most frequently occurring disorder, whereas patient self-reports indicated that anxiety disorders (n = 18; 21.1%) and affective disorders (n = 18; 21.1%) were the most prevalent psychiatric disorders. Nine of the patients who reported having one or more mental health disorders were not reported to have a mental health disorder by treatment personnel. Treatment personnel reported one or more mental health disorders in 15 patients whose self-reports indicated none. The difference between the patient-reported and personnel-reported mental disorders on overall psychiatric diagnosis was not significant when assessed with the McNemar test (p = .23). The number of mismatches in reports of the psychiatric disorders (24 patients; 28.2%) was considered sufficient to warrant further investigation. The discrepancy between patient and treatment personnel reports was significant for more specific reports of psychiatric diagnosis with respect to affective disorders (p = .05) and personality disorders (p = .02), there was also a trend towards a difference for anxiety disorders (p = .06).

Just over half of the patients (n = 46; 54.1%) reported using more than one substance (M = 2.26, SD = 1.424). Treatment personnel reported that 44% (n = 37) had two or more substance use disorders. Patient-reported substance use correlated significantly with the ICD-10 substance diagnoses reported by treatment personnel. The highest agreements between patient-reported use and personnel-reported use disorders were for alcohol (r = .510; p < .01), stimulants (r = .662; p < .01), opioids (r = .663; p < .01) and cannabis (r = .437; p < .01).

Associations between reported ICD-10 psychiatric disorders and ICD-10 substance use disorders were explored. Pearson’s correlation coefficients indicated that alcohol use disorder was negatively correlated with personality disorders (r = -.266; p < .05) and other ICD-10 disorders (e.g. schizophrenia spectrum, attention and conduct disorders; r = -.304; p < .01). Personality disorders were positively associated with ICD-10 multiple drug use disorder (r = .271; p < .05). The relationships between patient-reported mental disorders and substance use were also assessed using Pearson’s correlation coefficient. The category ‘other mental health
RESULTS

disorders’ (e.g. schizophrenia, eating disorders, attention and conduct disorders) correlated significantly with alcohol use \(r = -.277; p < .05\) and stimulant use \(r = .237; p < .05\). There were significant correlations between reported anxiety disorders and affective disorders \(r = .577; p < .01\), personality disorders \(r = .293; p < .01\) and other disorders \(r = .315; p < .01\).

The treatment personnel classified the severity of patients’ mental health and substance use problems using the quadrant model. These assessments were based on the treatment personnel’s experience and knowledge of individual patients and information from the patients’ charts. Treatment personnel classified 70.2\% \(n = 59\) of the patients as having severe substance use problems and less severe mental health problems. Approximately one fifth of patients \(n = 18; 21.4\%\) were classified as having severe mental health problems and severe substance use problems.

There was a minor difference between patient self-reports and treatment personnel reports of the number of patients with a psychiatric disorder (34\% and 41\%, respectively) and there was a mismatch in reported psychiatric disorders in 24 of 85 patients. When specific psychiatric disorders were considered the discrepancy was statistically significant for affective disorders and personality disorders and there was a trend towards significance for anxiety disorders. The quadrant model is an appropriate method for the assessment of the severity of mental health and substance use problems.
3.4 Paper IV: Domains and perceived benefits of treatment in patients with and without co-occurring disorders in undergoing in-patient substance use treatment

The research reported in paper IV investigated differences in the treatment given to patients in substance use disorder in-treatment, related to the presence or absence of psychiatric disorders. This was done by investigating interventions and the domains in which patients received help and patients’ perceptions of the benefit they derived from various forms of treatment and their satisfaction with the substance use disorder treatment programme. The research reported in this paper was carried out with sample 2 (see Section 2.1.2 for more information). Based on treatment personnel’s reports of the ICD-10 diagnoses on patients’ charts the prevalence of psychiatric disorders in this sample was 41.2% (n = 35).

Treatment personnel reported that the most frequent treatment interventions were intended to improve relationships with family and important others (n = 78; 91.6%), applied relaxation techniques (n = 66; 83.5%), psychodynamic therapy (n = 49; 62.1%), cognitive behavioural therapy (n = 39; 47.6%) and motivational interviewing (n = 35; 41.2%). Patients with co-occurring mental disorders received more cognitive behavioural therapy ($\chi^2 = 4.776$, df = 1; $p < .05$) and motivational interviewing ($\chi^2 = 8.704$, df = 1; $p < .01$) than patients without comorbidity.

Patients reported how much help they had received in a particular domain, how much benefit they had derived from treatment and their satisfaction with treatment on a scale ranging from 1 (very little) to 5 (very much). Patients reported that the domains most frequently targeted were relapse prevention ($M = 3.79$, $SD = 1.042$), physical health ($M = 3.67$, $SD = .910$), daily functioning ($M = 3.47$, $SD = 1.031$), psychological health ($M = 3.41$, $SD = 1.084$) and social relationships ($M = 3.40$, $SD = 1.040$). They also reported that they benefited most from physical activities ($M = 4.11$, $SD = .894$), support from co-patients ($M = 4.07$, $SD = .959$), group therapy ($M = 3.98$, $SD = 1.088$), problem-focused counselling ($M = 3.78$, $SD = 956$) and help with problems related to social situations ($M = 3.58$, $SD = 1.253$).

Overall the patients were very satisfied with the competence and knowledge of the treatment personnel and the treatment provided ($M = 4.56$, $SD = .715$). Patients with co-occurring mental disorders received significantly more help related to self-esteem ($t(72) = -2.443$, $p < .05$) and coping with psychiatric symptoms ($t(70) = -2.328$, $p < .05$). They also reported that they benefited more than patients with substance use disorders only from assessment of psychological health ($t(69) = -2.372$, $p < .05$), acute help ($t(54) = -2.364$, $p < .05$) and advice on coping with different social situations ($t(67) = -2.403$, $p < .05$). Of the total sample (N = 85), 9 women and 41 men had substance use disorders only, and 15 women and 20 men also had mental health disorders. Significantly more women than men had co-occurring disorders ($\chi^2 = 6.278$, df = 1; $p < .05$). Patients with one or more co-occurring disorders had a longer period of in-patient treatment measured in months (mdn = 3, IQR = 2 – 8.25) than patients with only substance use disorders (mdn = 2, IQR = 2 – 3.25). The difference between duration of treatment for patients with and without co-occurring disorders was significant when assessed with the Mann-Whitney U test ($p = .009$).
In-patient substance use disorder treatment targets many different needs and problems. Patients reported that they benefited most from interventions to improve social skills and psychological and physical health. There were differences between patients with and without co-occurring disorders on several measures. Patients with co-occurring disorders reported that they received more help with coping with psychiatric symptoms and self-esteem and that they benefited more from psychological health interventions and interventions related to coping with different social situations. Treatment personnel also reported that patients with co-occurring disorders received more cognitive behavioural therapy and motivational interviewing. Finally, this patient group also spent longer time in residential treatment.
4. SUMMARY OF THE THESIS

4.1 Main results

1. It appears from our results that the URICA is not a suitable tool for predicting motivation for changing substance use behaviour in patients entering substance use disorder treatment. The RTC and CA composite scores derived from the URICA did not predict whether patients would still be in treatment three months after entry. Use of the URICA instrument as a measure of motivation in patients with substance use disorder is questionable.

2. The SCL-90-R appears to be an appropriate tool for the measurement of general distress in patients in residential treatment for substance use disorder. This study showed that SCL-90-R is uni-dimensional and the GSI score appears to be a reasonable solution. Corroborating earlier research and providing evidence to support use of the SCL-90-R, patients in substance use disorder treatment had a higher psychiatric symptom score at the end of their in-patient treatment stay and had a higher score of general distress than a sample from the general normal population.

3. A comparison of patient self-reports and treatment personnel’s reports of the presence of psychiatric disorders showed that there was a consensus in most cases (72%), although there was a discrepancy in 24 of 85 patients. The discrepancy between self-reports and treatment personnel’s reports of specific psychiatric disorders was statistically significant for affective and personality disorders, with a tendency towards significance for anxiety disorders. A comparison of patients’ reports of substance use and treatment personnel’s reports of substance use disorders revealed no significant differences. Treatment personnel assessed most patients as having severe substance use problems and less severe mental health problems using the quadrant model. However, one in five patients was assessed to have severe substance use problems and severe mental health problems.

4. In-patient treatment clinics seek to provide help in many problem domains. Patients reported that they received most help with relapse prevention, physical health and daily functioning. Patients reported benefiting from psychological health and physical activity interventions. Help with relationships and the benefit derived from the support of co-patients and group-therapy were also rated highly by patients. Patients were very satisfied overall with the treatment they had received and with the competence and knowledge of the treatment personnel. There were some differences between patients with and without co-occurring psychiatric disorders. Treatment personnel reported that patients with co-occurring psychiatric disorders received more cognitive behavioural
therapy and motivational interviewing than patients without co-occurring disorders. Patients with co-occurring disorders reported that they received more help with coping with psychiatric symptoms and self-esteem, and that they benefited more from acute help, support from co-patients, psychological health interventions and interventions to improve their ability to cope with different social situations.

4.2 Implications of the findings from the papers

4.2.1 Motivation for behavioural change

Although motivation is thought to be of great importance for a change (reduction) in the substance use, motivation is difficult to measure and valid indices of motivation are difficult to develop. The reported factor structure of the URICA provided a barely acceptable fit to the data reported in paper I. In addition, there were significant correlations between all stages indicating that the URICA is affected by problems with collinearity and that it is not measuring discrete stages of change. The RTC and CA composite scores of the URICA did not predict whether a patient would still be in treatment three months later. This makes the use of the URICA as a tool for predicting motivation for behavioural change and motivation to complete treatment questionable in patients with substance use disorders.

Earlier studies had suggested that the composite RTC and CA scores provided measures of motivation for behavioural change (Pantalon, Nich, Frankforter, & Carroll, 2002; Field, Duncan, Washington, & Adinoff, 2007). This was not supported by our data. Field and colleagues (2009) explored if increased motivation was associated with the treatment outcomes substance use and retention. Motivation was proposed to increase by motivational enhancement therapy or motivational interviewing, and was measured with the use of the composite scores RTC and CA. These results indicate that increased motivation did not influence treatment outcome, which is in accordance with our results.

RTC and CA only had one small correlation with each other indicating that they measure two distinct kinds of motivation. Motivation change rapidly and is influenced by many factors. The utility of indices of motivation as predictors of future behaviour may therefore be low. Carpenter, Miele and Hasin (2002) found that patients in their study were motivated when entering treatment but that this motivation had no mediating effect on predicting later substance use.

Despite the failing of the URICA instrument to predict motivation for behavioural change and motivation to complete treatment, some results from this study suggested that it measured some factors relevant for motivation. Most patients’ had their highest scores on items related to the contemplation and action stages when entering treatment. Persons in the contemplation stage are aware that they have a problem, which they need to change. Persons in the action stage have moved a stage further and are acting to change behaviour. Since treatment mainly is voluntarily some degree of motivation for change is to be expected. Or it could be that they feel that they have to appear motivated in order to enter treatment. RTC scores were higher at follow-up than at baseline. This suggests that patients were more ready for behavioural change three months after starting to receive treatment. The opposite pattern was observed for
CA, indicating that patients were less committed to act to change after treatment than on entering treatment. It could be that patients are ready for change but lack the necessary confidence in own abilities to manage a change. After a time period trying to change it could be that patients realize some of the difficulties following a change and remember some of the positive sides of substance use. These contradictions in the composite scores at follow-up support the argument that the use of the composite scores to predict behaviour should be avoided. The use of the URICA instrument to assess patients’ motivation for changing substance use behaviour should therefore be questioned (Blanchard, Morgenstern, Morgan, Labouvie, & Bux, 2003; Field, Adinoff, Harris, Ball, & Carroll, 2009; Sutton, 2001).

The appliance of other instruments intended to measure motivation could have yield different results. In addition to URICA, Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonigan, 1996), and the Readiness to Change Questionnaire (RCQ, Rollnick et al., 1992) are both instruments based on and derived from the TTM. Napper and colleagues (2008) investigated the validity of these three instruments. They found only moderate agreement in the assessment of stages and some support of the construct validity of the instruments. Although derived from the same model, the instrument of choice would assess the readiness for change differently. This indicates that the instrument measures something other than stages of change. Since motivation is shifting and difficult to measure, instruments measuring motivation is therefore difficult to develop.

There are other theories, and hence instruments, intent to explain motivation and change in substance use behavior. The Treatment Motivation Questionnaire (TMQ) is developed from the self-determination theory and intended to assess internal and external motivation for treatment (Ryan et al., 1995). With the use of this instrument a relationship between internalized motivation and greater patient involvement and retention to treatment in out-patient alcoholism clinics was found. Motivation to quit using drugs can also be measured with the use of DUDIT-E (Berman, Palmstierna, Kallmen & Bergman, 2007). In Norway the use of DUDIT-E is recommended by the National guideline for assessment, treatment and rehabilitation of persons with co-occurring substance use disorders and psychiatric disorders (Norwegian Directorate of Health, 2012b). It could also be that the association between motivation and emotional distress complicates the process of changing behavior (Cahill, Adinoff, Hosig, Muller & Pulliam, 2003). There is a need for further investigation of instruments measuring motivation in patients with substance use disorders to be able to fully understand motivation, the sources of it and the implication for substance use disorder treatment.

4.2.2 Measurement of psychiatric symptoms

The results reported in paper II indicate that the SCL-90-R is an appropriate instrument for the measurement of general distress in patients with substance use disorder. The SCL-90-R is a self-report instrument for screening for psychological distress which is widely used in clinical settings and in research (e.g. Derogatis, 1994; Haver, 1997; Mercier, et al., 1992). The original nine-dimensional structure was not supported because of the high correlations
between the dimensions. This indicates collinearity issues raised by applying the nine-dimensional structure and that the instrument have a uni-dimensional structure. The GSI is a viable alternative to the nine dimensions.

The results reported in paper II provide evidence of the discriminant validity of SCL-90-R and the GSI. GSI scores in a sample from the substance use disorder population were higher than GSI scores in a sample from the general population in Norway. This is in line with earlier research on co-occurring disorders, indicating more severe general distress among patients in substance use disorder treatment than in the normal population (Grant et al, 2004; Regier et al, 1990; Swendsen et al., 2010). There were meaningful associations between GSI score and other criterion variables such as early contact with treatment clinics, recipient of prescribed medication for psychiatric disorder and the presence of individual psychiatric disorders. These associations provide further evidence that the patient group had more severe mental health problems than the normative comparison group. The difference in mental health is important to consider in treatment settings to insure that the treatment target patients’ needs. Holi, Sammallahti and Aalberg (1998) found in a study validating the Finnish version of SCL-90, that SCL-90 was a useful tool for screening for distress in research settings. The results reported in paper II suggest that the same is true regarding the revised version of SCL-90. Research often intend to measure results of interventions using different therapy techniques. In regard to interventions aimed to reduce general distress the GSI appear to be a good indicator of change.

The SCL-90-R and the GSI appear to be an appropriate tool for screening for psychological distress in the population of patients with substance use disorders to assess the need for a more thorough structured interview to diagnose psychiatric disorders. This could increase the utilization of resources to map patients’ mental health. The GSI score could be used as an indicator of whether patients with substance use disorders also needs treatment that targets mental health issues. The SCL-90-R consists of 90 items and is time consuming for patients to complete. Although it has good discriminant and concurrent validity of the one-dimensional structure, instruments measuring distress with less items could be considered used. Strand, Dalgard, Tambs and Rognerud (2003) found that instruments with fewer items than the SCL-90-R performed as well as indices of psychological distress. The HSCL-10 has also showed to be a useful tool to screen general distress in patients in substance use treatment clinics in Norway (Hoxmark, Nivison & Wynn, 2010). Instruments with fewer items should therefore be considered used instead of the 90-item instrument in context that set demands on recourses and time.

4.2.3 Prevalence of mental health problems as reported by patients and treatment personnel

The results of paper III showed that the prevalence of co-occurring mental health and substance use problems was high, in line with earlier research (Flynn & Brown, 2008; Landheim et al, 2002; Mueser et al, 2006; Merikangas et al., 1998). Using the quadrant model treatment personnel assessed one in five patients as having severe problems with substance use and mental health. Awareness among substance use treatment providers about the high rate of psychiatric comorbidity is therefore important. There was a strong association between
self-reported substance use and treatment personnel’s reports of substance use disorders, although reported use of substances does not mean that the patients have a substance use disorder related to it. Patients have accurate and valid responses to questions about substance use when in treatment and are encouraged to be honest about it (Weiss et al., 1998). In the reported prevalence of psychiatric disorders there was an overall difference of 7% between the reports. In relation to the individual patient’s psychiatric disorders there was a discrepancy between the patient’s and the treatment personnel’s report of the presence of psychiatric disorder for 24 (28%) out of 85 patients, which was not statistically significant. However there were statistically significant differences between patient- and personnel-reported psychiatric disorders for affective and personality disorders. We also found a trend towards a difference for anxiety disorders. These results indicate that communicating about psychiatric disorders is something that could be improved in substance use disorder clinics. Treatment personnel reported a higher prevalence of personality disorders than the patients. Personality disorder is associated with negative characteristics and is perceived to be stigmatizing, hence it is more difficult for patients to acknowledge this as an illness they have. It could also be that treatment personnel have difficulties to communicate to patients that they have these problems. The therapeutic alliance between patients and counsellors is regarded as an important factor in the treatment process (Meier, Barrowclough & Donmall, 2005). The treatment personnel could be afraid to put the therapeutic alliance at risk by communicating psychiatric diagnosis that could be perceived as stigmatizing for the patients. Regarding affective and anxiety disorders the reports of these disorders were higher from the patients than from the treatment personnel. These disorders could be perceived to have fewer stigmas, which could mean that it is easier for patients to acknowledge them.

An exploration of differences in reports about sleep disturbance from patients and clinicians in a mental health care setting showed similar results. Patients who were diagnosed with a mental disorder almost never got an insomnia diagnosis, and patients’ experience of sleep disturbance was imprecisely recognized (Kallestad et al., 2011). In one study by Mericle and colleagues (2012), both patients and treatment personnel under-reported the need for treatment of mental health problems. Under-reporting or poor recognition of mental disorders by treatment personnel or patients may have serious consequences for treatment and treatment outcomes. This illustrates the importance of improving understanding of mental disorders in addiction settings. Lack of patient understanding of psychiatric health could have a negative influence on the recovery process. It is important that patients play an active part in the recovery process. It is therefore crucial that there is open communication about screening for mental health problems and arriving at a diagnosis. Likewise, over-reporting of psychiatric diagnosis by treatment personnel is a potential source of bias. Discrepancies between reports of mental health disorders call into question the validity of reported diagnoses and suggest that patient needs may not being addressed in these cases. Treatment clinics should strive to achieve a shared understanding of a patient’s wants, needs and illnesses between the patient and treatment personnel. It is difficult for them to work together towards a goal if they have different perceptions of what it is and how to achieve it.
SUMMARY OF THE THESIS

Researchers should also be aware of possible biases when collecting information on topics considered to be sensitive by the respondent. Data on psychiatric problems may vary considerably depending on the source of the information. Future research should aim to increase both the validity and reliability of data on mental health problems among patients with substance use disorders to ensure that patients’ needs are adequately addressed. More information is needed about the relationship between information provided by patients and treatment personnel about psychiatric diagnoses. Future studies should combine structured diagnostic interviews with reports from treatment personnel and patients. It would also be interesting to compare the results of structured diagnostic interviews with the information in the patients’ charts. The combination of different sources may provide more specific information about multiple areas and would increase confidence in the research findings.

The results also showed that many patients used several substances and had several substance use disorders. Use of several substances could make the patients’ illnesses more severe. It is important that treatment targets problems associated with polysubstance use (Ives & Ghelani, 2006). Associations between polysubstance dependence and social anxiety disorder have been found (Bakken, Landheim & Vaglum, 2005). This indicates that dependence on several substances is influencing individuals’ mental health. Polydrug use is also a risk factor for mortality associated with drug overdoses (Gossop, Stewart, Treacy & Marsden, 2002).

Assessments using the quadrant model showed that most patients were assessed by the treatment personnel as having severe substance use problems and less severe mental health problems. However, one in five patients was assessed by treatment personnel as having severe problems with substance use and mental health. The quadrant model could be used as a framework for consultation, collaboration and integration of substance dependence and mental health treatment services. The feasibility of the model has earlier been supported when applied to classify patient characteristics and the use of services (McGovern et al., 2007). Patients with co-occurring anxiety and mood disorders perceived as less severe could often experience a decline in the psychiatric symptoms as the substance use is reduced, and hence is not in need of specific targeted treatment of these (Verheul et al., 2000). Individuals with severe substance use problems and less severe mental health problems should typically be the responsibility of the substance use disorder treatment clinics, whereas patients with severe mental health problems and less severe substance use problems should generally be the responsibility of mental health care providers. However, the quadrant model illustrates that some patients have mental health problems which are severe enough to require an integrated approach to treatment (Keyser, Watkins, Vilamovska, & Pincus, 2008). Recommendations and definitions to guide assessments made using the quadrant model should be developed to ensure the validity of the model. This study suggests that the quadrant model is an appropriate and promising tool for categorising patients with substance use disorder and targeting the treatment of co-occurring disorders.
4.2.4 In-patient treatment

Results of the research reported in paper IV showed that a range of treatment interventions is used to treat substance use patients, and they received help with and benefit from treatment related to many problem domains. Patients with co-occurring psychiatric disorders may need a different, more integrated approach to treatment due to the complexities of their illness.

According to treatment personnel the most frequently provided treatment interventions were to improve relationships with family and important others, applied relaxation techniques, psychodynamic therapy, cognitive behavioural therapy and motivational interviewing.

The patients reported that they received most help in the domains of relapse prevention, physical health, daily functioning, relationships, psychological health and self-esteem. Their reports also indicated that they benefited most from physical activities, support from co-patients, group therapy, counselling and assessment and treatment of psychological health problems. Relapse prevention was one of the domains in which patients received the most help. Relapse prevention is a crucial part of substance use disorder treatment as success in treatment is often measured in the literature as absence of substance use (Flynn & Brown, 2008).

Patients considered that improvements in psychological and physical health were a priority. Since the prevalence of co-occurring psychiatric disorders is high and assessment can take a long time, it is important that psychological health is targeted in treatments for the whole patient group. Patients in substance use disorder treatment often have impaired physical health and have several diagnoses of somatic disorders (Dalen, Holmen & Nordahl, 2015). This, together with patients’ recognition that this was an important target for improvement, indicates that structured physical activity and training should be an integral part of substance use disorder treatment. Studies have also found that physical activity has important mental health benefits (Richardson et al., 2005; Saxena, Van Ommeren, Tang, & Armstrong, 2005). A recent study which investigated high-intensity interval training in patients with substance use disorders reported that this kind of training should be a part of the recovery process (Flemmen, Unhjem & Wang, 2014). Almost all patients received interventions and help targeted at improving their relationships with family and important others. Involvement of partners or family in treatment could improve patients’ recovery process. In mental health treatment behavioural couple or family therapy has shown to reduce substance use and improved the adjustments of the relationships (Meis et al., 2013). Patients also reported that they benefited from support from co-patients and group therapy. It is unclear if there are any differences in treatment outcome between treatment with individual or group therapy (Weiss, Jaffee, Menil & Cogley, 2004). Social support and interactions are important in helping to prevent substance use and relapse (Broome, Simpson & Joe, 2002). Co-patients who are going through the same problems and face the same barriers to changing behaviour can be a source of inspiration. Social support is recognised as an important part of the twelve-step programme (Fiorentine & Hillhouse, 2000; Galanter, 2007). Most patients were generally satisfied with the treatment they received as in-patients. This is in line with earlier findings.
suggesting that patients in substance use disorder treatment are satisfied with their treatment (Chan, Sorensen, Guydish, Tajima, & Acampora, 1997). There were differences between patients with co-occurring disorders and those with substance use disorders only on several measures relevant to treatment, which will be mention in section 4.2.6 on co-occurring disorders.

4.2.5 Gender differences among patients in residential substance use disorder treatment

It is more men than women in substance use disorder treatment. The prevalence of women in substance use disorder treatment is relatively low compared with the expected prevalence in the general population (Greenfield et al., 2007). An explanation of this could be that the women seeking treatment for substance use problems are more traumatized. Hence, they have also poorer mental health. Seeking treatment for substance use could also be more stigmatisation for women than men. Although women are less likely to seek treatment than men, once in treatment gender is not predicting the retention or outcome of treatment (Greenfield et al., 2007). However, it could be that women have different needs that should be addressed in treatment than men have, and hence, could benefit from a different kind of treatment (Prendergast, Messina, Hall & Warda, 2011). In our study, women were more likely to have co-occurring mental disorders than men. Female gender is also a predictor of higher levels of mental distress (Hoxmark et al., 2010). The SCL-90 instrument could be useful in identifying psychiatric disorders among female alcoholics (Haver, 1997). For individuals with co-occurring disorder it has been found that women more often showed self-threatening behaviour, while men had complications with their family and showed health and social problems (Di Lorenzo, Galliani, Guicciardi, Landi, Ferri, 2014). It has been shown that gender specific treatment clinics for women reduced the drop-out from treatment and that it also had a positive impact on the mental health compared to women treated in mixed gender clinics (Greenfield et al., 2007). It is possible that women can benefit from gender specific treatment groups designed to address specialised needs that are more prevalent for women. Women could therefore benefit from having treatment groups for woman only.

4.2.6 Co-occurring disorders

This thesis support the findings that many patients have co-occurring psychiatric problems and receive more help and perceive more benefit of help in some domains. As mentioned earlier in this thesis, patients with a psychiatric diagnosis reported that they received more help with coping with psychiatric symptoms and self-esteem, and that they benefited more from acute help, support from co-patients, psychological health interventions and interventions to improve their ability to cope with different social situations than patients without a psychiatric diagnosis did. Patients about to end their in-patient treatment stay still had higher psychiatric symptom score than a sample of the normal population. This indicates that there should be a strong focus on mental health in substance use disorder treatment. Treatment personnel reported that patients with co-occurring disorders were more likely to be given some treatment interventions, like motivational interviewing and cognitive behavioural therapy than patients without a co-occurring disorder. These finding suggest that this patient
group has differential needs than patients without psychiatric diagnosis and that these differential needs are met to some degree. Having co-occurring disorders tends to increase the need for treatment (Mueser et al., 2006). The patients with co-occurring disorders in this study stayed longer in residential treatment, indicating that they had more problems and were in greater need of treatment. The appliance of the quadrant model in this thesis showed that about one in five patients were assessed to have high severity in both substance use problems and mental health problems when entering substance use disorder in-patient treatment. Higher use of substances is also associated with high level of mental distress (Hoxmark et al., 2010). The course of dual diagnosis could be disabling for the individual, and treatment programs are required to deal with these disabilities when screening, making treatment interventions and supporting the patient when in treatment (Di Lorenzo et al., 2014). This stresses the importance of screening patients for psychiatric symptoms and supports the use of the quadrant model to place the patients in the four severity quadrants. The appliance of the quadrant model demand few resources and could provide a good picture of the level of severity among the patient group.

The classification systems of psychiatric disorders could be regarded as too strict, and a dimensional approach should be considered (Bjelland & Dahl, 2008). Especially since the diagnostic criteria in the two systems do not take symptoms differences in gender and age into consideration. There is a variance in psychopathology depending on gender and age (Hudziak, Achenbach, Althoff & Pine, 2007), but this is not considered in the diagnostic systems. As this thesis has shown there is a discrepancy between reports from patients and treatment personnel in diagnosis of affective and personality disorders. A dimensional approach to psychiatric disorders can possibly make the communication with the patients about their diagnosis easier.

Substance use disorder treatment should aim to target patients’ individual needs and problems, and patients with co-occurring psychiatric problems should be given more extensive help in some areas. The results of this thesis show that to some extent this is already being done. Norwegian health authorities have elaborated a National guideline for assessment, treatment and rehabilitation of persons with co-occurring substance use disorders and psychiatric disorders (Norwegian Directorate of Health, 2012b). The goal with this guideline, by implementing it, is to improve the quality of life and the services given to these individuals. The guideline could be used as a tool by treatment services to apply existing knowledge and competence to treat patients with concurrent problems. It is important to acknowledge that patients with substance use disorders and co-occurring mental problems are a heterogeneous group with different but overlapping needs. Future research should investigate the relationships among patients’ needs, wants and the treatment they receive.

With the growing approach to standardised treatment, it is important to remember to be flexible and recognise the need of the individual patient.
4.3 Limitations of the studies

This study is subject to several potential limitations related to the design, sample, analysis and assessments of social constructs such as motivation and psychiatric diagnoses. All of these limitations could have biased the results.

4.3.1 Design

The research reported in papers II-IV was carried out with sample 2 and used a cross-sectional survey design. This type of design was chosen because it provides useful data in a relatively short period of time. It is cost effective and requires fewer resources than other designs (e.g. longitudinal designs). Patients who participated in the study completed a questionnaire on a single occasion and made no further contribution.

A longitudinal design would have enabled us to explore temporal changes in patients with substance use disorders. This might have been beneficial in the research reported in papers II and IV. It would have enabled us to investigate whether patients’ psychiatric distress changed over time as part of the research for paper II. It would have given us the opportunity to compare the help patients needed and wanted when they entered treatment with what they received as part of the research for paper IV. It would also be interesting to see if different treatment strategies and targeting of problem domains predict abstinence from substance use after treatment. In research with sample 1 a prospective design was used. A group of patients were interviewed on treatment entry (baseline) and three months later (follow-up). The outcome measure was whether patients still were in treatment three months after. Ideally other outcome measures (like substance use, retention in treatment etc.) should have been used in combination to give indication of change. Increasing the number of assessment points would have enabled a more detailed assessment of the course of any changes. It would also have been interesting to follow the patients for longer than three months. At baseline there were 95 participants, but after three months the number of participants had fallen to 41, giving a drop-out rate of 56.8%. This drop-out is rather large and the conclusions must take account of this limitation. Prospective research is more difficult to carry out because of the possibility of loss to follow-up, and because it is more time demanding and is also more expensive than cross-sectional research.

The studies reported in this thesis relied on patient self-reports and treatment personnel and interviewers’ assessments of patients. Treatment personnel reports relied on their memory of the relevant information, although some of the questions (e.g. psychiatric disorders, time in treatment) were about information found in patients’ charts. Finally, assessments of patients in paper 1 could be biased because the majority of the assessments were conducted by one interviewer. The use of self-report questionnaire data may create problems, because respondents may misunderstand the questions (low face validity) or give socially desirable responses. Studies investigating health care utilization by comparing self-reports with other sources of information have revealed inaccuracies in self-report data which particularly effect data related to sensitive issues and stigmatisation (Bhandari & Wagner, 2006; Killeen, Gold, Tyson, & Simpson, 2004). Psychiatric disorders are often perceived as a sensitive issue and may therefore be under-reported in self-reports. Patients self-reports of substance use have
however proved to be accurate (Babor, Steinberg, Anton, & Boca, 2000). The URICA, SCL-90-R and other questionnaires used in the research for this thesis are self-report instruments and this may have resulted in some inaccuracies in the data. Questions in the SCL-90-R asking if the respondent had thoughts about suicide, felt alone, had a feeling of being inferior etc., could be affected by social desirability as these may have been perceived as sensitive issues by the patients. This may have resulted in incorrect reporting of psychiatric distress. The treatment personnel were asked if the patient had any diagnosis of psychiatric disorders, but they were not asked which, if any, diagnostic tool they used. Systematic screening of psychiatric disorders using standardized tools could improve patients’ treatment and help (Wynn, et al., 2013).

The quadrant model was applied in a different way than it has been in earlier research. In this thesis all patients were placed into a quadrant in the model, not just the patients with one or more psychiatric diagnosis. This new use of the model can be justified on the basis of our additional findings; that there is a high occurrence of co-occurring disorders in the sample, and a high score of psychiatric symptoms among the patients at the end of their in-patient residential stay. It is important to know the level of severity of mental health and substance use problems among the patient population to be able to give patients treatment according to their level of severity. Another possible limitation of the quadrant model in this thesis is the retrospective use of it. The treatment personnel were to assess the degree of the severity of the patient as it were when they entered treatment. The assessments were based on the experience and knowledge of the treatment personnel, and optimally a creation of a standardized guide for the placement of the patients into quadrant should be considered. 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 and type of substances used and how they are used).

4.3.2 Sample
When conducting quantitative studies one aims to obtain a representative sample of the population in order to be able to generalise from the results. The size and the distribution of attributes of a sample can be used to determine whether it can be considered representative. This thesis is based on work carried out with two samples which resembled each other, except in the prevalence of psychiatric disorders, age and in the reported main substance used (see Section 2.1). There was a difference in the prevalence of self-reported psychiatric disorders between the two samples (83% vs. 34%). Some of this difference was probably due to difference in the time of measurement. Patients in sample 1 were about to enter treatment and many had recently been through a tough period of withdrawal, which may have made them over-report mental health problems. Patients in sample 2 were at the end of a residential treatment programme. We assume the level of psychological stress was more stable in sample 2 patients than sample 1 patients and that this can explain some of the difference. In sample 1, information on patients’ psychiatric disorders and the main substance used was collected through an interview and the form and tone of questioning may also have influenced the results. The discrepancy might also have arisen because of the small size of the samples and a selection bias in patients included in the two samples. There were also differences in reported
SUMMARY OF THE THESIS

main substances in the two samples. In sample 1 the main substance used was stimulants (33%) whereas in sample 2 alcohol (45%) was the main substance used. Heroin was also used somewhat less by sample 2 (11%) than sample 1 (15%). The mean age of the patients in sample 2 was also higher than in sample 1. These differences in age, substance use and psychiatric disorders are due to an imbalance in the recruiting of patients from the different treatment clinics resulting from a convenient sampling procedure. However, the two samples are not applied in the same analysis and comparisons in measurements are not done.

Unfortunately, in sample 1 information on patients’ time in treatment and reasons they were dismissed from treatment was not available. The clinics which patients entered treatment and hence the treatment model used at the clinics was not included in the analysis. It could be that separating the out-patients from the in-patients could have yield different results. The same is the case if we had compared the clinics, the two different samples from the clinics, or treatment models used in the samples. The sizes of the samples should have been larger to make these comparisons possible. It is unknown how many patients who entered the treatment clinics during the data sampling period and possible biases regarding the representative of the samples could be the result.

In sample 2 treatment personnel were only asked a limited number of questions about themselves. Ideally it would be interesting to ask all treatment personnel about the treatment given to the patients and relevant factors about the treatment staff, e.g. to see if any of the staff had a history of substance use disorder themselves.

The selection process is another possible source of bias in the samples. The researcher did not have direct contact with the patients, nor did she have any knowledge about who the patients were, hence it could have been a systematic bias in the type of patients invited to participate in the study. In sample 1, the person who recruited the patient was in most cases also the person doing the interview and who administered the questionnaire. This person was consulted when interpreting the analysis of the sample. In sample 2, the treatment clinics recruited the participants. Each treatment clinic had one designated person who was responsible for recruiting patients to the study and who had contact with the researcher. We cannot exclude the possibility that there were some systematic differences between respondents and non-respondents in the studies. Because we were not able to compare study participants with eligible potential participants who refused to participate, there is a possibility that the samples were affected by a selection bias.

Ideally the samples used in the studies reported in this thesis would have been larger. However, the distribution of age and gender in both samples resembles the substance use disorder population in Norway (see Iversen et al., 2009; Ravndal & Lauritzen, 2004) and the samples were considered satisfactory representative of the population from which they were drawn with respect to these two traits. Unfortunately these factors may be too few to provide definitive assurance that the samples were representative of the population of interest.

Conducting clinical research is challenging. Patients may be focused on getting treated and getting well and voluntary participation in another activity may be seen as a distraction. The same problem may affect recruitment of participants by treatment personnel. Treatment
personnel may feel that a research project interferes with their job and choose not to invite some patients to participate. These problems are sometimes reflected in the small size of research samples. In one of the samples (sample 1), there was a large drop-out at the follow-up assessment. About two thirds of the sample dropped out between the baseline assessment and the follow-up assessment. It may be that patients with specific characteristics were more likely to drop out, if this was the case it would have influenced the data and the results would reflect the selective drop-out process. However, the sample age and gender distributions were similar at follow-up and baseline, indicating that the results from follow-up also could be seen as representative of the population of interest.

4.3.3 Analysis

Because of the small sample size in the studies there was a risk of making Type II errors. The sample size was not large enough to permit complex statistical analysis to explore causal explanations of the results. Analysis of associations between psychiatric disorders and RTC and CA (paper I) had to be omitted as a consequence of the high prevalence of reported psychiatric disorders in sample 1. Restrictions on statistical analysis are a potential bias in the results of the study.

4.3.4 Implications of the limitations

Taken together, the potential for these biases to have affected the findings leads us to recommend that the URICA instrument’s ability to predict behaviour, the dimensional structure of the SCL-90-R instrument, discrepancies between self- and other-reported psychiatric diagnoses and differences between the treatment received by patients with and without co-occurring psychiatric disorders, and the use of the quadrant model on patients with-out a psychiatric diagnosis should be tested further using a larger sample in the future.
5. MAIN FINDINGS

On the basis of the results, and taking into account the limitations discussed in this thesis, the following conclusions were reached:

1. Motivation is from the clinical perspective an important factor which needs to be assessed before and during treatment. Research shows that motivation is difficult to measure and that there is still a lack of good instruments to assess it. The URICA and the RTC and CA composite scores do not provide a suitable index of motivation to predict whether patients entering substance use disorder treatment will stay in treatment. More research should be done to develop an instrument which can be used to predict change in substance use behavior and measure motivation for this change.

2. Mental health problems and substance use disorders often co-occur. Patients about to end their in-patient stay at a residential substance use disorder clinics have a high symptom score of general distress. The SCL-90-R appears to be an appropriate tool for the measurement of general distress and can be used to assess whether a more thorough structured interview to diagnose psychiatric disorders is needed. The scores of GSI were associated with self-reported psychiatric disorders and prescribed medication of mental illness, which also supports the discriminant validity of SCL-90-R.

3. To enable the best possible treatment outcome for patients it is important that they have a good understanding of their own mental health and good communication with treatment personnel. There were some discrepancies between patients’ and treatment personnel’s reports of the presence of psychiatric disorders. There were statistically significant differences in the reports of the presence of affective and personality disorders. The quadrant model is an appropriate tool for treatment personnel to categorize all patients according to the severity of their mental health and substance use problems. The quadrant model provided evidence that the majority of patients in treatment for substance use disorder have severe substance use problems and less severe mental health problems.

4. The biopsychosocial model has influenced the foundation of the Norwegian substance use disorder treatment system and treatment clinics target many problem domains and use a variety of treatment interventions. Patients considered that they benefited from help in several domains. There were differences between patients with and without co-occurring disorders in terms of interventions received, problem domains targeted and perceived benefits of treatment. Patients with co-occurring disorders have a different need for treatment than those without, and treatment clinics are more likely to give them cognitive behavioral therapy and motivational interviewing.
In substance use disorder treatment several aspects and areas are important. This thesis focuses on the many aspects considered to be of importance for patients with substance use disorders, and the results particularly highlight the importance of focusing on general distress, psychological and physical health, social support, the assessment of motivation and co-occurring mental disorders in substance use disorder treatment. Patients with co-occurring mental disorders received some differential treatment. Treatment clinics should strive to target treatment of many problem domains to all patients, with individual adjustments where it is necessary. The findings from this thesis support the important of implementing the national guideline for assessment, treatment and rehabilitation of persons with co-occurring substance use disorders and psychiatric disorders.
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7. PAPERS I-IV
PAPER I
The Predictive Validity of the URICA in a Sample of Patients in Substance Use Treatment

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Abstract

Objectives: This study aimed to measure motivation for substance use treatment by using the University of Rhode Island Change Assessment (URICA). The composite URICA scores for Readiness To Change (RTC) and Committed Action (CA) were used to investigate their predictive validity regarding whether patients were still in substance use treatment 3 months after entering treatment.

Methods: The sample consisted of 95 patients from substance use disorder treatment facilities in Norway. The patients were interviewed and given a self-administered URICA at pretreatment and 3 months later.

Results and Conclusions: RTC and CA did not predict being in treatment 3 months later, and only minor associations were found with other investigated variables. The results indicate that the predictive validity of URICA for measuring motivation to change in substance use is low and URICA should be used with caution.

Key Words: substance use disorder, behavior change, readiness to change, URICA

Research shows that working with the patient’s motivation to make a change in their substance use is of great importance in order for both a cognitive and a behavioral change to occur. 1-3 The degree of motivation to change is highly related to the success of changing substance use and behavior. Evidence suggests that to some extent, a high degree of motivation for change can even compensate for less efficient treatment. 4,5 The TTM has been modified several times during recent years, but the model proposes that a behavioral change process could be understood as going through 5 stages: precontemplation, contemplation, preparation, action, and maintenance (see Prochaska and DiClemente 6 for a further description of this). These stages describe a development illustrated like a spiral, and it is suggested that people will move back and forth within the spiral in relation to their change process. 7 In the addiction field, the TTM of intentional behavioral change has often been used to explain lapses and relapses when individuals try to stop using substances. 8 Interventions should be tailored to fit the individual’s level of motivation and assess their readiness to change. 7,9 On the basis of the theory related to the TTM, several instruments have been constructed to measure motivation and thereby the individual’s commitment to behavioral changes. 10-13 The University of Rhode Island Change Assessment (URICA) 11 is an example of such an instrument. The URICA has been used in a number of different research areas related to behavioral changes, 14 such as smoking, 5 exercise 15,16 eating disorders and weight problems, 17 different psychological problems, 18 and drug and alcohol abuse. 19 The TTM suggest there are 5 stages of change, but in the URICA the stage of preparation has been taken out, based on different studies which have questioned the empirical validity of such a stage. 11,20 The creators of URICA firstly assumed that the total...
scores on this instrument could categorize the individual’s motivational stage. One problem in such an interpretation of the total scores relates to the fact that an individual could receive high scores in different stages, making it difficult to use the total score on the URICA to assess motivation for change. To solve this methodological problem, different composite scores or scales have been proposed. The first composite score suggested was Readiness To Change (RTC), forming a single score to assess for readiness to change. The RTC score is computed by adding the mean scores of contemplation, action, and maintenance scales together, and then subtracting this sum by the mean score of precontemplation. The RTC score is proposed to give an indication of how ready a person is to change their problem behavior. Although the RTC score could be a better indicator for change than the total score of URICA, there has been some criticism that the RTC score just measures desire to change, and therefore cannot be seen as a reliable indicator for behavioral change. Subsequently, a new composite score was therefore proposed by Pantalon et al. named Committed Action (CA) in order to correct this problem. Unlike the RTC score, the CA score was computed by subtracting the score of the contemplation stage from the action stage in URICA. This calculation was used because contemplation (thinking about changing, but not acting) is thought to mirror a person’s ambivalence to change, and the sum of commitment will therefore be the result if ambivalence is subtracted from the willingness to act. As suggested by Pantalon et al., the CA score could be a better estimate for behavioral change, because it can give a better indication of how committed the person is to changing their problem behavior.

The URICA has been used both in research and in clinical settings to assess the stages of motivation and a person’s readiness for behavioral change. It is proposed that stage of change at pretreatment is related to the outcome of psychotherapy. Unfortunately, the use of different study designs, samples, and statistical analysis of the data, and various interpretations of URICA scores, have generated diverging evidence regarding utilization of the URICA for assessing motivation in the substance use disorder population. Findings from different studies using URICA to assess readiness and motivation for change are inclusive, and some studies also question the URICA’s predictive validity related to future problem behavior. Altogether, this raises questions about the URICA’s validity and reliability in assessing and predicting motivation for treatment. There are also few studies that have been carried out in the substance use field using the composite scores RTC and CA to assess the validity of URICA. Because URICA enables the possibility of getting high scores on multiple stages at the same time, the composite scores could be better predictors for motivation for treatment. As motivation for treatment is of high importance for the course of recovery, it could be of interest to investigate the predictive validity of the URICA in a sample of patients on substance use treatment.

The aims of the study were as follows: first, to investigate if the URICA is a suitable tool to measure motivation for treatment in patients with substance use disorder; second, to explore whether or not the URICA can predict if patients still will be in the treatment after 3 months as a behavioral indication of motivation for treatment; and finally, to explore any important associations between RTC and CA scores with other treatment-related variables in substance abuse patients.

MATERIALS AND METHODS

Design
This sample consisted of patients from addiction treatment institutions in central Norway. Data were collected during the period June 2010 to January 2012.

The inclusion criteria for this study were: (1) participants had to be over 18 years of age; (2) had to show sufficient stability regarding psychological symptoms and drug intoxication; and (3) had to meet the ICD-10 criteria for addiction. After an initial assessment interview, the participants were given a self-report survey containing the 52-item URICA instrument.
After 3 months of treatment they were called in for a follow-up assessment with a second interview and the URICA instrument. For each patient, a case-report form was created which contained information on treatment placement and treatment retention. The study has been approved by the regional committee for medical and health research ethics (REK) and the Norwegian Social Science Data Services.

Sample
Atotal of 112 patients were asked to participate in the study; 95 (66.31% men and 33.68% women) gave their consent. The distribution of sex in the sample is representative of the population in the substance addiction field (see Iversen et al29). Ages ranged from 18 to 62 years (M = 34.45, SD = 9.89). The main substances used in the sample were stimulating drugs (33.7%), alcohol (24.2%), heroin (14.7%), opioids/pain-killers (10.5%), sleeping medicine/sedative (7.4%) and cannabis (7.4%). In all, 74.4% of the sample had previously been in contact with addiction treatment facilities for their substance use problems. The number of such treatment contacts with different addiction treatment facilities ranged from 0 to 20 (M = 1.75, SD = 2.52). The number of contacts with inpatient psychiatric treatment facilities ranged from 0 to 10 (M = 1.64, SD = 2.18). In all, 85% of the sample reported having ≥1 psychiatric diagnoses. At the follow-up assessments, 41 persons answered URICA, making a dropout rate of 56.8%. The distribution of age and sex at follow-up was similar to those at baseline.

Instruments
Data retrieved from the interview in this study included questions regarding psychiatric diagnoses and the main drug of choice. The interviewer also evaluated the patient’s readiness/willingness to change and the need for treatment. Readiness/willingness to change were measured on a 5-point Likert scale, where a score of 1 indicates active participation and appropriate concern with their problem and 5 indicates a wish to avoid treatment or no acknowledgment of their substance addiction/misuse problem. Patients were also assessed and scored on their need for treatment, where a score of 1 means that treatment is necessary and 5 that treatment is life dependent.

The URICA11 is a 32-item self-report instrument, which was created to measure the individual’s motivation and readiness for change. The questionnaire is composed of statements that respondents have to answer on a 5-point Likert scale, where a score of 1 indicates strong disagreement and 5 indicates strong agreement with the statements. The statements in the URICA do not specify which kind of problem the respondents are asked to assess their motivation for change toward, but patients in the current study were instructed to relate answers to their substance problems.

Statistical Analysis
The statistical analyses were done with the statistical software package PASW 18 and AMOS. Descriptive analysis of the different variables related to the sample was performed. The Pearson correlation coefficients were computed to analyze bivariate correlations between different variables of interest in the study. A confirmative factor analysis (CFA) was performed to see if the URICA showed an acceptable fit on their dimensional structure. The internal consistency of URICA was examined by computing Cronbach’s α and average corrected item-total correlations for the dimensions in URICA. At follow-up assessment, a paired sample t test was conducted to see whether the means in RTC and CA had changed from baseline and at follow-up 3 months later. Cohen d values were calculated to provide effect sizes for the mean differences. A Cohen d of 0.20 reflects a small difference, a d value of 0.50 indicates a medium difference, and 0.80 is a large difference.30

RESULTS
The URICA is proposed to consist of 4 factors. To explore whether the original factor structure in the URICA could be replicated in our sample,11,19
a CFA with all the 32 items in URICA was performed. The CFA showed that the original factor structure had a low to barely acceptable fit. To show a good fit to the model, the Comparative Fit Index (CFI) should have shown values over 0.95 and the Root Mean Square Error of Approximation (RMSEA) values should ideally be around 0.05, and not higher than 0.10. The CFI value was somewhat below ideal (CFI = 0.66), but the RMSEA was acceptable (RMSEA = 0.076).

Reliability scores were also computed for all 4 dimensions on the URICA. The contemplation (α = 0.713), action (α = 0.766), and maintenance (α = 0.775) stages had satisfactory Cronbach’s. However, the precontemplation stage (α = 0.580) had a lower Cronbach’s score. On the basis of this result, we computed the average score for the corrected item-total correlation, which is 0.31. According to Field, a score over 0.50 is considered satisfactory. The score for the precontemplation dimension was over 0.30, and therefore a lower Cronbach’s could be accepted. See Table 1 for more details related to reliability scores of the URICA.

Mean scores, SDs, and bivariate correlations for the 4 different stages were computed (Table 2). The scores on these different stages in our study were in accordance with the findings of earlier studies. The precontemplation stage had the lowest mean value and the contemplation stage had the highest. The action score was almost

<table>
<thead>
<tr>
<th>Dimensional Structure of URICA</th>
<th>Average Corrected Cronbach</th>
<th>Item-Total Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precontemplation</td>
<td>0.580</td>
<td>0.31</td>
</tr>
<tr>
<td>Contemplation</td>
<td>0.713</td>
<td>0.41</td>
</tr>
<tr>
<td>Action</td>
<td>0.766</td>
<td>0.47</td>
</tr>
<tr>
<td>Maintenance</td>
<td>0.775</td>
<td>0.49</td>
</tr>
</tbody>
</table>

RMSEA = 0.076, CFI = 0.66, χ²/df = 748.05, Df = 558, P = 0.001. CFI indicates Comparative Fit Index, RMSEA, Root Mean Square Error of Approximation.
identical to the contemplation scores in previous studies. Patients participating in our study had their highest scores on items related to the contemplation and action stages. See Table 2 for more details related to the different stages.

We also wanted to explore the correlations between the composite scores RTC and CA of the URICA with the different stages in URICA. The RTC at baseline in our study had a mean score of 7.88 (SD = 0.970). As RTC is composed by subtracting precontemplation from the sum of all the other dimensions, it correlated negatively with the precontemplation score \( r = -0.244, P < 0.05 \), and positively with the scores for contemplation \( r = 0.651, P < 0.01 \), action \( r = 0.837, P < 0.01 \), and maintenance \( r = 0.900, P < 0.01 \). The CA composite score had a mean \(-0.02\) (SD = 0.393). CA correlated significantly with the stages of contemplation \( r = -0.395, P < 0.01 \) and action \( r = 0.397, P < 0.01 \). There was also a small but significant correlation between CA and RTC \( r = 0.236, P < 0.05 \). At follow-up, the RTC score had a mean of 10.19 (SD = 2.556) and the CA mean score was 0.59 (SD = 0.471). The composite scores correlated significantly at follow-up with the scores at baseline \( r = 0.612, P < 0.01 \) and CA \( r = 0.504, P < 0.01 \). See Table 3 for further details.

At follow-up the RTC and CA did not correlate significantly, which was the opposite finding to the results on baseline. A paired sample t test was therefore performed to explore if there were any changes in the means of the RTC and CA at follow-up. The changes in RTC \( t_{39} = -7.246, P < 0.01 \) and CA \( t_{39} = -8.412, P < 0.01 \) were significant, and the Cohen d indicated that these differences were large in both RTC \( d = -1.165 \) and CA \( d = -1.596 \) scores.

The association between interviewers’ assessments, other variables collected in the interview, and patients’ scores on RTC and CA were thereafter investigated. Patients’ readiness and willingness for treatment had a mean score of 5.75 (SD = 0.85). There were no significant correlations between RTC and the variables from the interview at baseline. Scores of CA at baseline showed a small significant correlation with use of alcohol as a primary substance \( r = -0.249, P < 0.05 \), indicating a greater commitment to action among those abusing alcohol. At follow-up the CA score had a significant correlation with assessed need for treatment \( r = -0.408, P < 0.01 \). The correlations on the interview variables mentioned above and the mean composite scores of RTC and CA from baseline and follow-up were also examined (Table 4).

DISCUSSION

In accordance with the assumption that URICA measures 4 stages of change, the original factor structure

| TABLE 3. Means, SDs, and Pearson Product-Moment Correlations Coefficients |
|------------------|----------------|----------------|----------------|----------------|----------------|
|                  | M   | SD  | PC   | C   | A   | M   | RTC | CA   | Follow-up RTC |
| Baseline:        |     |     |      |     |     |     |     |      |                |
| RTC              | 7.88| 0.976| -0.244*| 0.651†| 0.837†| 0.900†| —   | —    | —              |
| CA               | -0.02| 0.393| 0.096| -0.395†| 0.397†| 0.053| 0.236*| —    | —              |
| Follow-up:       |     |     |      |     |     |     |     |      |                |
| RTC              | 10.15| 2.55| -0.710†| 0.923†| 0.927†| 0.884†| 0.612| 0.109| —              |
| CA               | 0.59| 0.477| -0.080| 0.005| 0.567†| 0.245| 0.132| 0.504†| 0.283         |

*Correlation is significant at the 0.05 level.
†Correlation is significant at the 0.01 level.
A indicates action stage; C, contemplation stage; CA, committed action; M, maintenance stage; PC, precontemplation stage; RTC, Readiness To Change.
The Predictive Validity of URICA

Table 4. Pearson Product-Moment Correlations Coefficients for Treatment Variables and RTC and CA at Baseline and Follow-up

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Follow-up</th>
</tr>
</thead>
<tbody>
<tr>
<td>RTC</td>
<td>CA</td>
<td>RTC</td>
</tr>
<tr>
<td>Sex</td>
<td>0.131</td>
<td>0.232</td>
</tr>
<tr>
<td>No. contacts with addiction treatment facilities</td>
<td>-0.051</td>
<td>0.043</td>
</tr>
<tr>
<td>In treatment at 3 mo follow-up</td>
<td>-0.045</td>
<td>0.131</td>
</tr>
<tr>
<td>Alcohol</td>
<td>-0.062</td>
<td>-0.249*</td>
</tr>
<tr>
<td>Drugs</td>
<td>0.062</td>
<td>0.249*</td>
</tr>
<tr>
<td>Ready/willing</td>
<td>-0.059</td>
<td>0.153</td>
</tr>
<tr>
<td>Need for treatment</td>
<td>0.007</td>
<td>-0.165</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level.
**Correlation is significant at the 0.01 level.
CA indicates committed action; RTC, Readiness To Change.

Participants in our study had their highest mean scores in contemplation and action stages, and the lowest mean score was in the precontemplation stage. This could be a reflection of the fact that the respondents studied were patients entering treatment for their substance use problems and might thus already be very motivated to change their behavior, or feel inclined to appear motivated. Carpenter et al. have also found that individuals were highly motivated when entering treatment, but this motivation did not have any mediating effect on substance use at follow-up. However, there have been results showing that the scores of the precontemplation stage are associated with treatment dropout. Including substance abusers not seeking treatment could have created a greater diversity related to differences in motivational stages between the respondents in our sample. But if measuring motivation to change has no predictive ability on whether patients are in treatment 3 months after entry, it would not matter whether the subjects were seeking treatment or not.

Some studies have suggested that the RTC and CA indexes could act as a measure of motivation for behavior change. On the basis of our results, the URICA does seem to have less predictive value in foreseeing patient motivation and if they stay in treatment. The results from our study shows that RTC and CA only had a small correlation with each other, which could suggest that they represent different types of motivation for change, but neither the RTC nor CA scores could predict whether the
patients still were in treatment after 3 months. In addition to these findings, we could not find any evident association between these composite scores and the other variables collected from the interview. These findings are in accordance with Field et al's results on the predictive validity of the same URICA composite scores described in our study. Although Field et al found a small correlation between RTC and treatment outcome in their study, they did not find any support for RTC or CA having a moderating or mediating effect on treatment retention or substance use.

Limitations of the Study
There are several potential limitations in our study. First, only 2 factors were used to assess change: the URICA and whether patients were still in treatment 3 months later. Perhaps the use of other predictors for behavior change at follow-up, such as degree of substance use, psychiatric diagnosis, and compliance with treatment, could have provided other information. However, if we compare the distribution of sex and age to client data reports from 2008, the distribution was almost the same.

Second, there was also a large dropout rate at the follow-up assessment, so the results from this study could be a representation of such a process. However, the sample distribution on age and sex was similar at follow-up and baseline, indicating that the results from follow-up also could be seen as representative of the sample. Third, the sample size was not large enough to perform more complex statistical analysis and a regression analysis should have ideally been executed; this could potentially be a bias in the results of the study. The fourth possible limitation related to the validity of the results could be that the URICA instructs respondents to report their motivation to change regarding their alcohol and drug use/abuse before they fill out the survey, but this is not stated explicitly in each question. More targeted questioning in the items related to substance abuse might give different results than those obtained in this study. Fifth, the URICA relies on self-report. The use of self-reported data in questionnaires could create methodological problems, because people could misunderstand the questions asked (low face validity). Fifth, the patients' reports related to the use of alcohol and illicit drugs were not divided into different groups. Separating these in the analyses could have yielded different results. Research on behavior change targeting alcohol abuse and smoking has better developed stages of readiness to change than other substances of abuse. However, in our study the correlations between RTC and CA and the use of alcohol and drugs showed minor results, suggesting no or only small alterations of the results by such a division.

Finally, if a longer time period and several measurement points had been used, this could have yielded different results. Motivation is not a fixed factor, and to assess this correctly, several test points to measure changes over time are needed. In our study, the respondents were patients entering addiction treatment on a voluntary basis. Some degree of motivation is necessary to enter treatment, and we would expect this group to show a higher mean in the contemplation or action stage. This could lead to a possible sample error.

Despite the limitations described above, our findings are in line with results from other studies conducted in the substance addiction field. The findings suggest that questions should be asked related to the use of the URICA when assessing motivation for change. In addition to the problems of the URICA, the research findings also raise questions related to the use of the TTM as a guiding theory to understand behavior change and motivation. Although the theory underlying the TTM is supported by some research findings, there is still uncertainty over whether the URICA has any predictive validity regarding motivation for treatment. Sutton reviewed the use of the TTM in the substance field and indicated that the evidence for using this model to work with change in substance use is meager and inconsistent. There are also other instruments based on or derived from the TTM, such as the Stages of Change Readiness and Treatment Eager-ness Scale (SOCRATES) and the Readiness to Change Questionnaire (RCQ). Napper et al have investigated the
convergent and discriminate validity of URICA, SOCRATES, and the RCQ and found that these instruments show inconsistent findings. Only moderate agreement in stage assignment and some support for the construct validity in the instruments have been found. Although derived from the same model, different instruments assess readiness for change differently. Sutton therefore suggest instruments assess readiness for change derived from the same model, different consistent findings. Only moderate found that these instruments show in-
URICA, SOCRATES, and RTQ are measuring something other than discrete stages of change, which might imply that there is a need for a better model and theory of behavioral change.

The use of instruments to measure complex areas such as behavior change and motivation based on TTM theory should therefore be used and interpreted with caution. If used, the URICA instrument should be adapted and targeted toward specific problem behaviors of interest. It is possible that adjusting the instrument to the specific target problem behavior will make the instrument a more useful assessment tool for motivation than it is today. It is questionable whether the use of composite scores such as RTC and CA makes URICA a better predictive measure of motivation for change.

CONCLUSIONS

There is a need for further investiga-
tion of instruments measuring moti-
vation in patients with substance use disorder. The URICA scales and the composite scores, RTC and CA, of the URICA do not seem to have any predic-
tive validity at follow-up, and it is ques-
tionable whether it should be used as a motivational measure in the treatment of patients with substance use disorder. The use of the URICA instrument could lead to poor treatment decisions and inefficient research, encumbered by the measurement of constructs that have not consistently proven to be valid.

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The dimensional structure of SCL-90-R in a sample of patients with substance use disorder

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Abstract

Aim: To test the dimensional structure of the Symptom Check List-90-Revised (SCL-90-R) among inpatients with substance use disorders (SUD), and to examine whether the Global Severity Index (GSI) scores discriminated between SUD patients and a general Norwegian population sample. The concurrent validity of the SCL-90-R was also examined. Methods: The sample included 85 patients from inpatient SUD treatment clinics in Norway. The patients responded to a survey in the week before they were discharged from treatment. Results: The SCL-90-R is a feasible instrument for measuring general distress among patients with SUD. The patients reported higher scores on the GSI than the general population. This is coherent with the high prevalence of co-occurring psychiatric symptoms in the SUD population. The concurrent validity of SCL-90-R was satisfactory. Conclusion: The SCL-90-R is unidimensional, and the use of the earlier established factor structure is discussable. The GSI score may be a feasible alternative.

Introduction

The prevalence of comorbid psychiatric disorders is high among patients with substance use disorders (SUD) (Flynn & Brown, 2008; Landheim et al., 2002). Positive correlations have been found between substance abuse and psychiatric disorders in previous studies, both related to the type of psychiatric disorder and to the severity of the disorder (Landheim et al., 2006; Merikangas et al., 1998). These results suggest that the patients need treatment which is both directed towards their SUD and their mental problems.

The most common psychiatric disorders which are related to substance use disorder are anxiety, depressive and personality disorders (Landheim et al., 2002). The same study reported that as many as two-thirds of patients in substance use treatment have had one or more co-occurring psychiatric disorders and were in need of simultaneous treatment both for substance misuse and psychiatric disorders. Having a psychiatric diagnosis increases the risk of a relapse into substance use for persons with substance use disorders (Flynn & Brown, 2008; McGovern et al., 2005). One obstacle for the treatment of comorbid disorders could be the lack of knowledge and competence about psychiatric problems in the substance use field and the opposite in the psychiatric field.

Reliable and valid instruments that could assess psychiatric problems may be useful to reveal such problems of comorbidity in the SUD population. Structured interviews which aim to assess for psychiatric disorders are often too resource demanding and time-consuming. As such, screening tools which may be easier to apply and aid clinicians in detecting psychiatric symptoms are needed.

One widely used self-report screening instrument of psychological distress, both in clinical settings and in research, is the Symptom Check List-90-Revised (SCL-90-R) (Derogatis, 1994; Haver, 1997; Mercier et al., 1992). Derogatis & Cleary (1977) investigated the dimensional structure of the SCL-90 and found support for the construct validity of the instrument. They argued that the instrument consisted of a nine-dimensional structure, using 93 of the 90 items. There were seven configural items that did not fit into any of the symptom dimensions. Despite the common use of the SCL-90-R, studies in SUD settings tended to use the same multidimensional factor structure which has been established by research from general psychiatric settings. It is possible that the dimensional structure of this instrument is different among patients with SUD. To the best of our knowledge there are no studies that have examined the factor structure of this instrument among patients from a wide range of inpatient SUD treatment clinics.

When an instrument like SCL-90-R is applied, it is important that it measures patients' current state related to psychiatric distress. Studies conducted among psychiatric patients have found instability in the nine-dimensional
structure of the SCL-90-R (Cyr et al., 1985). These results could suggest that the original nine symptom dimension is constituted of just one dimension, and therefore that the instrument is really measuring a general discomfort or distress, instead of nine diverging dimensions of psychological problems suggested by others. Holi and others (1998) did a validation study of the SCL-90-R in general psychiatry settings in Finland, and found that the items segmented into just one general factor. They also reported high intercorrelations between the nine original dimensions, which also could suggest that the instrument is measuring one dimension. A single predominant factor was also suggested in a study using a sample of patients from a psychiatric hospital with comorbid SUD and psychiatric disorders (Carpenter & Hittner, 1995). Vassend & Skrondal (1999) concluded that different methodological strategies can produce different results; a further exploration of the original nine dimensions is therefore supported among patients with SUD. To the knowledge of the authors, there are few studies which have examined the concurrent validity of the SCL-90-R, including patients with SUD.

The aims of our study were threefold:

1. To examine whether the unidimensional structure of the SCL-90-R instrument could be replicated among inpatients with SUD.
2. To explore the discriminant validity of the SCL-90-R by comparing differences in the Global Severity Index (GSI) scores between patients with SUD and data obtained from a general Norwegian population sample.
3. To examine the concurrent validity of the GSI by correlating GSI with demographic variables, self-reported psychiatric diagnosis and treatment for mental health problems.

Method

Setting and design

This study used a sample of patients from five different inpatient SUD treatment clinics in Central Norway. Data were collected over a one-year period from May 2011 to May 2012. Inclusion criteria to participate in this cross-sectional study were that the patients had to be over 18 years of age, and receive treatment in an inpatient clinic for substance use disorders. They also signed an informed consent to participate in the study. Respondents who consented to participate in the study answered an electronic questionnaire during their last week of stay at the inpatient clinic. The study was approved by the Regional Committees for Medical and Health Research Ethics in Central Norway.

Sample

There were 85 patients included in this study. The gender distribution was 22 (25.9%) women and 63 (74.1%) men. This distribution of gender reflects the Norwegian patient population in treatment for substance use disorders (see Iversen et al., 2009). Patients’ age ranged from 20 to 72 years (M = 38.3, SD = 11.8). The main substances used in the sample were alcohol (45.2%), stimulating drugs (29.8%), heroin (10.7%), sleeping medicine/sedatives (7.1%), cannabis (6.0%) and other substances (1.2%). A relatively large proportion of the sample (54.1%) reported use of more than one substance (i.e., poly-substance use). One or more psychiatric diagnoses were reported by about one-third (34.1%) of the sample, and about one-third of these patients (29.4%) received prescribed medications for a mental illness. Affective disorders (21.2%) and anxiety disorders (21.2%) were the most frequently reported psychiatric disorders. Personality disorders were reported by 4.7% of the sample and 12.9% reported to have other disorders which were not related to anxiety, affective or personality disorders. A total of 65.9% reported one or more contacts with psychiatric treatment facilities in the past. These included contact with inpatient clinics (34.6%) and 41.2% had been in contact with acute inward care. A total of 56.6% also reported previous contact with psychiatric outpatient clinics. Patients could have received help from more than one of these facilities and therefore the percentiles exceed 100%.

Instruments

The Symptom Check List-90-Revised (SCL-90-R, Derogatis, 1994) contains 90 self-report items measuring psychiatric distress. The items are rated on a five-point scale indicating the degree of distress ranging from 0 (not at all) to 4 (extremely) in the last seven days. Although the SCL-90-R is a revised version of SCL-90, only three items were changed from the original version. Comparison between results obtained from the two instruments is thus possible (Vassend et al., 1992).

The SCL-90-R includes nine dimensions measuring one symptom domain each, using 83 of the total 90 items (Derogatis, 1994). These dimensions are: (1) Somatisation (symptoms like headache, dizziness, nausea, upset stomach); (2) Obsessive compulsive (complaints about recurrent thoughts, difficulties remembering things, problems concentrating); (3) Interpersonal sensitivity (complaints like being easily hurt, subervient, shy, self-conscious); (4) Depression (complaints like loss of energy, loneliness, feeling depressed, pessimistic about the future); (5) Anxiety (complaints like worry, nervousness, timidity); (6) Hostility (easily gets angry, annoyed, destructive impulses); (7) Phobic anxiety (having to avoid places or situations, aversion, for example, to taking the bus or train, or going to the shops); (8) Paranoid ideation (complaints of suspicion, lack of confidence with people, blaming them for his/her own problems); and (9) Psychoticism (believing that other people control your thoughts, has thoughts that are not your own, thinking something is seriously wrong with your body, delusions, hallucination). Seven items do not segment into any specific symptom dimension and were therefore not included in any of the nine dimensions.

There are three global indexes derived from the SCL-90-R: GSI, Positive Symptom Distress Index (PSDI) and the Positive Symptom Total (PST). This study will only use the GSI, which is calculated by summarising the mean value of the nine symptom dimensions and the seven additional items divided by the total number of responded items. The SCL-90 has previously been tested in a sample from the general Norwegian population (Vassend et al., 1992), and the GSI
mean scores and standard deviations from that study were used to compare the general Norwegian population and the SUD patients’ sample.

Statistical analysis

The statistical analyses were performed with the statistical software packages PASW 18 and AMOS 20. All analyses used a conventional significance level of 0.05. Descriptive analyses were performed to yield characteristics of the sample. Pearson correlation coefficients were computed to analyse bivariate correlations between different variables of interest in the study.

First, the theoretical unidimensional structure was tested using a Principal Component Analysis (PCA). A confirmatory factor analysis (CFA) was performed to explore the unidimensionality of the instrument and to test in further detail whether the SCL-90-R one-factor structure had an acceptable fit to the empirical data. A good fitting model reflects Comparative Fit Index (CFI) values above 0.95, and the Root Mean Square Error of Approximation (RMSEA) values should ideally be around 0.05, and not be higher than 0.10 for a good model-data fit (Blunch, 2008). The Goodness of Fit Index (GFI) should approach 1 to indicate a good model-data fit and the Root Mean-square Residual (RMR) should have values below 0.05 (Blunch, 2008). The internal consistency of the SCL-90-R was examined by computing Cronbach’s alphas and average corrected item-total correlations. An independent samples t-test was performed to investigate differences between patients with SUD and the general Norwegian population sample. Cohen’s d values were calculated to provide effect sizes for the mean differences. A Cohen’s d of 0.20 reflects a small difference, a d value of 0.50 indicates a medium difference and 0.80 is a large difference (Cohen, 1988).

Results

First, a PCA was performed to explore the dimensional structure of SCL-90-R. This analysis showed that a high proportion of the variance was explained by the first factor (34.13%). Second, a Varimax rotation with 0.25 iteration was carried out. The scree plot showed that the instrument segmented into one dominant factor. On the basis of this finding, a new PCA was performed extracting one factor from the sum scores of the nine dimensions and the additional configural items. The total explained variance was 66.58%. In addition, the Pearson product-moment correlation coefficients had rather high values (significant at 0.001 level) between all nine dimensions and the additional configural items, except in the hostility dimension. Several of the dimensions had correlations lower than 0.70 indicating that the nine-dimensional structure may have collinearity issues (Table 1).

A CFA was performed on the basis of the PCA which used the sum scores from the nine dimensions and the additional configural items. The CFA showed an acceptable fit of the proposed model. The Chi-square was 76.10 (df = 36, \( p < 0.001 \)). The RMSEA value was somewhat higher than ideal (RMSEA = 0.115). Moreover, the CFI value indicated that the model could not be rejected (CFI = 0.94). The GFI value was also considered to be acceptable (GFI = 0.84), and the RMR further indicated a well-fitting model (RMR = 0.17). In summary, both PCA and the CFA showed that the unidimensional structure of the SCL-90-R could not be rejected.

To test these results, further reliability indices were computed for all the nine dimensions and the additional configural items (Table 2). A mean score of the corrected item-total correlation was also computed. The reliability indices showed that all the nine dimensions of SCL-90-R had satisfactory corrected item-total correlations and Cronbach’s alphas. Corrected item-total correlations above 0.30 and Cronbach’s alpha above 0.70 are considered satisfactory (Tabachnick & Fidell, 2007). Cronbach’s alphas were also calculated both for the GSI scores using 83 items and SCL-90-R with all the 90 items (\( \alpha = 0.942 \)). Both indexes had high reliability and very good average corrected item-total correlations.

The next step was to investigate the discriminant validity of the SCL-90-R. The GSI scores ranged from 0.02 to 2.28, and had a mean score of 0.66 with a standard deviation of 0.52. To examine differences between the mean scores of GSI in the SUD patient sample and norm data (Vassend et al., 1992) from the general population in Norway (\( M = 0.37, SD = 0.39 \)), a two-tailed independent samples t-test was applied. This test showed significant differences between the current sample and the Norwegian general population sample (\( t \) (1151) = 6.418, \( p < 0.001 \)). The Cohen’s d indicated that this difference was modest (\( d = 0.378 \)). The substance use treatment sample had significantly higher mean scores on the GSI than the general Norwegian population (Table 3).
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All nine dimensions and the additional configural items:

SCL-90-R (all 90 items) 0.942 0.76
GSI score 0.935 0.76
Psychoticism 0.749 0.42 0.78
Paranoid ideation 0.783 0.53 0.83
Interpersonal sensitivity 0.891 0.65 0.89
Obsessive-compulsive 0.887 0.62 0.88
Somatisation 0.903 0.64 0.83

Norwegian population data obtained from Vassend, Lian, and Andersen (1992). This adds support to the discriminant validity of the SCL-90-R.

To investigate the concurrent validity, we examined bivariate correlations between the GSI and clinical health as well as demographic criterion variables. We found no significant correlations between the GSI and gender and age. However, a significant positive correlation between the GSI and earlier treatment contact with psychiatric facilities (in-clinic, acute in-care and outpatient clinics) was detected in the analysis (r = 0.240, p < 0.05). There was also a significant positive correlation between the GSI and self-reported psychiatric diagnosis (r = 0.367, p < 0.01). Reported affective disorders (r = 0.468, p < 0.01), anxiety disorders (r = 0.327, p < 0.01) and personality disorders (r = 0.288, p < 0.01) correlated significantly with the GSI. Some of these patients also received prescribed medication for their psychiatric illness, and receiving medication had a positive correlation with the GSI (r = 0.275, p < 0.05). These results support the concurrent validity of GSI.

Discussion

The result of this study supported a unidimensional structure of SCL-90-R among patients with SUD. These findings could suggest that the application of the SCL-90-R diverges according to the target patient groups. The most common application of the SCL-90-R, both among patients with SUD and in general psychiatry, is to use the nine-factor structure. The present findings suggest that it may be more valid to use the GSI among patients with SUD to screen for psychiatric problems. Moreover, the SCL-90-R research should avoid using the nine dimensions in analysis because it may cause collinearity issues in prediction models.

A high on the GSI indicates that the respondents report more psychiatric symptoms. We found that the GSI mean scores were higher in the substance use treatment population than in the general population in Norway. This suggests a good discriminant validity of the GSI because two-thirds of the patients in substance use populations have co-occurring psychiatric symptoms (Landheim et al., 2002). Taken together this further supports the assumption that the GSI of the SCL-90-R has good discriminant validity and is a feasible tool detecting and screening for co-occurring psychiatric problems in patients with substance use disorder. Moreover, we found conceptually meaningful associations between the GSI and criterion variables, such as previous contact with psychiatric treatment facilities, receiving medication for a mental illness and the patients’ psychiatric diagnosis. These associations indicate support for the concurrent validity of the GSI among patients with SUD.

Strengths and limitations of the study

The distribution of age and gender in this study is about the same as in the substance use disorder population in Norway (Iversen et al., 2009). The sample is thereby yielding a feasible reflection of this population. In addition, this study is one of the first to investigate the factor structure of the SCL-90-R among inpatients with SUD and also to provide indicators of discriminant and concurrent validity of the GSI among these patients.

Despite these strengths, this study also has some potential limitations. First, the SCL-90-R contains a substantial battery of items and was used in combination with a sample of relatively few respondents. However, this issue was reduced by using sum scores of the dimensions instead of the scores of each item in the analyses. Second, this study used a cross-sectional method. The use of several measurement points in a prospective design would make it possible to examine changes in GSI values among patients over time which was not done in our study. Prospective studies should therefore be used to examine temporal changes in the GSI among patients with SUD. The SCL-90-R instrument also relies on self-report. The use of self-reported data could be a problem because patients could misinterpret the questions on the SCL-90-R (reducing face validity), and because the data were collected electronically it also placed requirements upon respondents’ computer skills. However, the SCL90-R has been used in a number of previous empirical accounts.

Given a context where the confidentiality of the patients has priority, such as in this study, it is likely to be a feasible screening tool of psychological distress. This study, moreover, did not obtain data from patients who refused to participate. We cannot exclude the possibility that there were some systematic differences between respondents and non-respondents in the study.
Notwithstanding the limitations, the study suggests that the SCL-90-R may solely consist of one factor related to general symptom severity instead of the original proposed nine-factor structure. Moreover, the results reflected a good discriminant validity of the instrument as the GSI discriminated between patients with substance use disorder and the general population as expected. Holi et al. (1998) suggested that the SCL-90-R could be useful as a screening instrument, or as an instrument for measuring change in symptomatic distress in research settings. Results from this study may apply to the SCL-90-R version. Moreover, SCL-90-R is a time-consuming instrument to complete for the respondents, and since it only appears to be a good measurement of general distress, an abridged form of the instrument like SCL-25, SCL-10 and SCL-5 should therefore be considered as alternatives.

Conclusion


Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

References


Iversen, E., Lauritzen, G., Skretting, A., & Skutle A (2009). Notwithstanding the limitations, the study suggests that the SCL-90-R: Evaluation of gender differences in dually diagnosed inpatients. Journal of Clinical Psychology, 51, 383–390. Notice of Correction: Changes have been made to this article since its original early online publication date of July 8, 2013.

DOI: 10.3109/14659891.2013.790494
Erratum: Page 3, Results section, line 5: To test if the differences between these reports were significant, a paired t-test was performed and was not significant; t (t(84)) = 1.228, p > 0.05. This sentence is incorrect and should have been deleted.
ORIGINAL ARTICLE

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

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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.

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 (Jané-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 differ in their severity and will also influence each other in different ways. Studies show
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 (McDonell 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 (McDonell 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.

<table>
<thead>
<tr>
<th>Quadrant</th>
<th>Severity of illness</th>
</tr>
</thead>
<tbody>
<tr>
<td>III</td>
<td>Less severe mental disorder</td>
</tr>
<tr>
<td></td>
<td>Less severe substance disorder</td>
</tr>
<tr>
<td>II</td>
<td>Less severe mental disorder</td>
</tr>
<tr>
<td></td>
<td>Less severe substance disorder</td>
</tr>
</tbody>
</table>

J Subst Use, Early Online: 1–6
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 (Nordfjærn, 2011). 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 (Nordfjærn, 2011).

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 = 0.270; ns). 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.

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 trend 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 (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.

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

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>ICD-10 Diagnosis n (%)</th>
<th>Self-reported disorders n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No psychiatric diagnosis</td>
<td>50 (58.8%)</td>
<td>56 (65.9%)</td>
</tr>
<tr>
<td>One or more psychiatric diagnoses</td>
<td>35 (41.2%)</td>
<td>29 (34.1%)</td>
</tr>
<tr>
<td>Affective disorders*</td>
<td>10 (11.8%)</td>
<td>18 (21.2%)</td>
</tr>
<tr>
<td>Anxiety disorders*</td>
<td>11 (12.9%)</td>
<td>18 (21.2%)</td>
</tr>
<tr>
<td>Personality disorders*</td>
<td>12 (14.1%)</td>
<td>4 (4.7%)</td>
</tr>
<tr>
<td>Other disorders*</td>
<td>11 (12.9%)</td>
<td>11 (12.9%)</td>
</tr>
<tr>
<td>F330-F39</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F40-488</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F60-469</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F20-F29, F50-F59, F70-F79, F90-98</td>
<td></td>
<td></td>
</tr>
<tr>
<td>p &lt; 0.05</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In this study the occurrence varied, with 34.1% of the patients having a severe level of both mental health and substance use problems (Table 3). 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 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 mental disorders and substance use, while weaker associations were found between treatment personnel and patient-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 heighten awareness of their mental health status and how they should manage their mental health after discharge from treatment.

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

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

<table>
<thead>
<tr>
<th>Substances used</th>
<th>ICD-10 n (%)</th>
<th>Self-report n (%)</th>
<th>Pearson correlation r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol</td>
<td>49 (57.6%)</td>
<td>59 (69.6%)</td>
<td>0.510**</td>
</tr>
<tr>
<td>Stimulants</td>
<td>30 (35.3%)</td>
<td>36 (42.4%)</td>
<td>0.662**</td>
</tr>
<tr>
<td>Opioids</td>
<td>14 (16.5%)</td>
<td>19 (22.4%)</td>
<td>0.663**</td>
</tr>
<tr>
<td>Sedatives</td>
<td>20 (23.5%)</td>
<td>26 (30.6%)</td>
<td>0.234*</td>
</tr>
<tr>
<td>Cannabis</td>
<td>23 (27.1%)</td>
<td>30 (35.3%)</td>
<td>0.437**</td>
</tr>
<tr>
<td>Other*</td>
<td>1 (1.2%)</td>
<td>12 (14.1%)</td>
<td>0.283**</td>
</tr>
</tbody>
</table>

*This 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.

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

<table>
<thead>
<tr>
<th>Substance use n (%)</th>
<th>Low</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental health n (%)</td>
<td>3 (3.6)</td>
<td>18 (21.4)</td>
</tr>
<tr>
<td>Low</td>
<td>4 (4.8)</td>
<td>59 (70.2)</td>
</tr>
</tbody>
</table>
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.

**Acknowledgements**

The authors would like to thank the patients who consented to participate in the study and the treatment personnel who completed the questionnaires and collected data.

**Declaration of interest**

None of the authors report any financial relationships with commercial interests. The source of funding had no role in the design, collection, analysis or interpretation of the data, the writing of the manuscript, or the decision to submit the manuscript for publication.

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PAPER IV
Domains and Perceived Benefits of Treatment Among Patients With and Without Co-Occurring Disorders in Inpatient Substance Use Treatment

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Objective: Persons with substance use disorders often have comorbid psychiatric problems, and treating all problem domains is important for treatment success and recovery. This study examined reported interventions provided to patients as well as patients’ reports of domains of help received, perceived areas of greatest benefit, and satisfaction with substance use disorder treatment. We also compared patients with co-occurring disorders and patients with only substance use disorders to see whether there were significant differences across groups on these measures. Methods: Patients receiving inpatient substance use treatment at clinics in Norway were recruited for the study. 85 completed a cross-sectional survey prior to discharge. Treatment personnel also completed a separate survey and gathered information from patient charts. Results: The most frequently provided treatment interventions involved improving relationships with family and important others, applied relaxation, psychodynamic therapy, cognitive behavior therapy, and motivational interviewing. Patients reported receiving the most help in domains of relapse prevention, physical health, daily functioning, relationships with people, psychological health, and self-esteem. They benefited most from physical activities, support from co-patients, group therapy, counseling, and assessment/treatment of psychological health. Patients with co-occurring disorders were given more exposure therapy, motivational interviewing, and cognitive behavior therapy interventions than those without comorbidity. Patients with co-occurring disorders self-reported receiving more help with self-esteem and coping with psychiatric symptoms and benefiting more from interventions involving psychological health, acute help, and social situations. Conclusions: Patients perceived psychological and physical health as important areas for improvement. There were differences between patients with co-occurring disorders and those with substance use disorders only in several measures. It is important to acknowledge that patients with substance use disorders and co-occurring mental problems are heterogeneous groups with unique but overlapping needs. (Journal of Dual Diagnosis, 10:91–97, 2014)

Keywords: substance use disorder treatment, co-occurring disorders, treatment domains, treatment benefit

The main goal in substance use treatment is behavioral change to bring about a significant reduction in, or obtain abstinence from, substance use. However, patients in substance use treatment face many other issues besides substance use, including both physical and psychosocial problems. Psychiatric and substance use disorders are often co-occurring (Flynn & Brown, 2008; Merikangas et al., 1998; Swendsen et al., 2010), and improvements in both substance use and mental health problems are considered to be important areas for recovery (Nordfjørn, 2011). Persons with substance use and comorbid psychiatric disorders tend to have a greater need for treatment related to additional problem domains, and the course of illness is more severe, in terms of both mental health and substance use (Mueser, Drake, Turner, & McGovern, 2006). A Norwegian study found that anxiety and depressive disorders were the most common comorbid psychiatric disorders in inpatients who were receiving treatment for substance use disorders (Landheim, Bakken, & Vaglum, 2002). In this sample, two-thirds of the patients undergoing treatment had one or more lifetime co-occurring psychiatric disorders and were in great need of treatment for both substance misuse and psychiatric disorders. Because patients with co-occurring disorders usually report having more problem domains, they have a greater need for integrated treatment that focuses on several problems at the same time (Mueser et al., 2006). Some differences in treatment needs between patients with only a substance use disorder and those with co-occurring disorders could be expected in the domains related to mental health and functioning. Both patients and treatment personnel may underestimate the need for integrated treatment of mental health and substance use problems, which could result in needs going unrecognized and untreated (Mericle, Martin, Carise, & Love, 2012). An accurate assessment of patient needs is critical to provide patients with
The treatment personnel questions were related to treatment interventions provided to the patient and to the International Classification of Diseases-10 (ICD-10) diagnoses as listed in patients' charts. These ICD-10 diagnoses were divided into two categories: psychiatric diagnosis (excluding any such diagnosis due to substance use) and substance use diagnosis, and this division are used in the rest of the paper. Those with a psychiatric ICD-10 diagnosis in their charts were defined as patients with a co-occurring disorder.

Participants

In total, 119 patients consented to participate in this study. Of these, 85 (71.4%) patients answered the patient questionnaire. The gender distribution in the sample was 25.9% women (n = 22) and 74.1% men (n = 63), and patients' ages ranged from 20 to 72 years (M = 38.3, SD = 11.8). The substances reported as main problem 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 (e.g., polysubstance use; n = 46; 54.1%). One or more psychiatric 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 were receiving medication for at least one of these disorders. Of those reporting at least one mental disorder, 79.3% (n = 23) had received treatment for their mental disorders in the past.

Statistical Analysis

Statistical analyses were performed using the software package PASW 18. An alpha level of .05 was used for all statistical tests. Descriptive analyses were performed to yield the characteristics of the sample. Pearson’s chi-square test, the Mann-Whitney U test and paired sample t-tests were performed to investigate whether there were any significant differences between patients with only substance use disorders and those with co-occurring disorders. In a Pearson’s chi-square test where the expected frequency is below five, Fisher’s exact test was used (Field, 2009).

RESULTS

Descriptive statistics were used to explore the treatment provided to patients with only substance use disorders and patients with co-occurring disorders at the inpatient treatment clinics. The treatment personnel reported that 41.2% (n = 35) of the sample had one or more co-occurring mental disorders based
on the classification criteria of the ICD-10 in the patients’ charts. Of these patients, the treatment personnel reported that 77.1% (n = 27) received treatment only at the clinic, while 14.3% (n = 5) received treatment both at the clinic and at another external facility. There were also 8.6% (n = 3) of the patients with co-occurring diagnosis who received no treatment for their comorbid psychiatric disorders. The most common psychiatric diagnoses in the sample were personality disorders (n = 12; 14.1%), anxiety disorders (n = 11; 12.9%), and affective disorders (n = 10; 11.8%).

Further, treatment personnel reported that the most common treatment interventions for substance use disorders involved improving relationships with family/important others (n = 78; 91.8%), applied relaxation (n = 66; 77.6%), psychodynamic therapy (n = 49; 57.6%), cognitive behavior therapy (n = 39; 45.9%), and motivational interviewing (n = 35; 41.2%).

Patients reported that they received the most help in the following domains: relapse prevention (M = 3.79, SD = 1.04), improving physical health (M = 3.67, SD = 1.01), daily functioning (M = 3.47, SD = 1.03), psychological health (M = 3.41, SD = 1.08), and their relationship with family and others (M = 3.23, SD = 1.14). See Table 1 for more details relating to these results. In addition, patients were asked to rate the types of treatment that they felt had given them the greatest benefit (see Table 2). The patients reported that they had benefited the most from physical activities (M = 4.11, SD = 0.89), support from their co-patients (M = 4.07, SD = 0.96), group therapy (M = 3.98, SD = 1.09), counseling related to different problem areas (M = 3.78, SD = 0.96), and counseling related to problems with social situations (M = 3.58, SD = 1.25).

We also investigated how satisfied patients were with the treatment they received. Over 90% of patients (n = 78, 91.8%)...
reported that, in general, they were satisfied or very satisfied with the overall treatment they received (M = 4.56, SD = .72). In addition, patients reported high satisfaction with their treatment personnel’s knowledge and competence about substance use (M = 4.04, SD = .92) and psychiatric problems (M = 3.68, SD = .98). Patients indicated that they felt they had a great influence on their own treatment (M = 4.08, SD = .83) and on their aftercare plan (M = 3.84, SD = 1.15).

Further, differences between patients with only substance use disorders and patients with co-occurring disorders were explored. Of the total sample, 9 women and 41 men had only substance use disorders, and 15 women and 20 men had co-occurring mental disorders. To test whether there were significant differences in gender and mental health problems, Pearson chi-square tests were performed. Women were more likely to have co-occurring disorders than men (χ² = 6.278, df = 1; p < .05), and patients with one or more co-occurring disorders had a longer period of treatment (measured in months; median = 3, interquartile range = 2–4.25) than patients with only substance use disorders (median = 2, interquartile range = 2–3.25; Mann-Whitney U; p = .009).

Patients with co-occurring disorders received significantly more of the following treatment interventions: structured social skills training (χ² = 4.776, df = 1; p < .05), cognitive behavior therapy (χ² = 8.704, df = 1; p < .05), and motivational interviewing (χ² = 8.704, df = 1; p < .05). Patients with co-occurring disorders were also more likely to receive exposure therapy than patients with only substance use disorder (Fisher’s exact test: p < .001). See Table 3 for more details related to treatment interventions.

Finally, it was expected that patients with co-occurring disorders would differ from those with substance use disorder only in relation to domains of help received and perceived benefits of treatment. Patients with co-occurring disorders, compared to those with substance use disorder only, reported having received more help in domains regarding self-esteem (t(72) = −2.443, p < .05) and how to cope with psychiatric symptoms (t(70) = −2.328, p < .05). In addition, patients with co-occurring disorders perceived more benefit from the assessment of psychological health (t(69) = −2.372, p < .05), acute help (t(54) = −2.364, p < .05), and how to cope with different social situations (t(67) = −2.403, p < .05) than patients with only substance use disorders. There were no significant differences between patients with and without co-occurring disorders regarding their satisfaction with treatment or the perceived influence they had on their own treatment.

**DISCUSSION**

The treatment personnel in this study reported that the most frequently provided interventions involved improving relationships with family and significant others, applied relaxation, psychodynamic therapy, cognitive behavior therapy, and motivational interviewing. Despite the fact that motivational interviewing was one of the most common interventions provided, fewer than half of all patients received motivational interviewing, which can be considered suboptimal since motivational interviewing has been shown to be effective in changing substance use behavior (Burke, Arkowitz, & Menchola, 2003; Rubak, Sandøe, Lauritzen, & Christensen, 2005). The results from this study could be interpreted as showing that the knowledge and training of the treatment personnel in performing motivational interviewing is lacking in some of the clinics we investigated. The lack of necessary knowledge and skills about treatment interventions and organizations dynamics influence implementation of evidence-based treatment strategies (Corrigan, Steiner, McCracken, Blaser, & Barr, 2001). This indicates that adequate training and implementation of motivational interviewing techniques and principles both within the organization and of the individual therapist should be prioritized in substance use disorder treatment in Norway. Research shows that motivational interviewing is highly beneficial for patients undergoing substance use disorder treatment (Burke et al., 2003; Rubak et al., 2005).

**TABLE 3**

<table>
<thead>
<tr>
<th>Treatment Interventions</th>
<th>COD (n = 35)</th>
<th>SUD (n = 50)</th>
<th>χ², df, p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anger management</td>
<td>5 (14.3)</td>
<td>5 (10.0)</td>
<td>.364, df = 1, p = .734</td>
</tr>
<tr>
<td>Motivating interviewing</td>
<td>21 (60.0)</td>
<td>14 (28.0)</td>
<td>8.704, df = 1, p &lt; .01</td>
</tr>
<tr>
<td>Applied relaxation</td>
<td>27 (77.1)</td>
<td>39 (78.0)</td>
<td>.09, df = 1, p = .100</td>
</tr>
<tr>
<td>Family/significant others</td>
<td>32 (91.4)</td>
<td>46 (92.0)</td>
<td>.01, df = 1, p = .100</td>
</tr>
<tr>
<td>Psychodynamic therapy</td>
<td>25 (65.7)</td>
<td>26 (52.0)</td>
<td>1.386, df = 1, p = .266</td>
</tr>
<tr>
<td>Cognitive behavior therapy</td>
<td>23 (60.0)</td>
<td>18 (36.0)</td>
<td>4.776, df = 1, p &lt; .05</td>
</tr>
<tr>
<td>Exposure therapy</td>
<td>16 (45.7)</td>
<td>4 (8.0)</td>
<td>16.275, df = 1, p &lt; .001</td>
</tr>
<tr>
<td>Social skills training</td>
<td>19 (54.3)</td>
<td>13 (26.0)</td>
<td>7.017, df = 1, p &lt; .05</td>
</tr>
</tbody>
</table>

*Note. COD = patients with co-occurring disorders; SUD = patients with substance use disorder only.*
The treatment personnel also reported that patients with co-occurring disorders received more of some treatment interventions than those with only substance use disorders, such as structured social skills training, cognitive behavior therapy, and motivational interviewing. Patients with co-occurring disorders had longer residential treatment stays, which indicates that they had more problems and were thus in need of more help. Comorbidity of mental health problems tends to increase the need for treatment (Mueser et al., 2006). The results of this study also showed that women were more likely to have co-occurring psychiatric problems than men.

The patients’ ratings related to their problems and the perceived benefits of their treatment varied across different domains. The patients reported that they received most help with and benefited most from relapse prevention and treatment to improve their physical health. The risk of relapse in substance use is high after treatment, and success in treatment is often measured in the literature as the absence of substance use after discharge (Flynn & Brown, 2008). A focus on relapse prevention is a major part of substance use disorder treatment and is also recognized by patients as an important domain. Further, patients also reported that they had received a great deal of help with self-esteem and improving their psychological health. The prevalence of mental health problems in the substance use population is high, and it is important for this to be addressed. Since it could be difficult to assess and get a correct psychiatric diagnosis, it is important for the treatment of frequently occurring mental health problems to be an integrated part of assessments and the treatment program. Co-occurring disorders and psychiatric health have a complex relationship, and if this was addressed in treatment it would improve patients’ treatment outcome (Tripp, Skidmore, Cui, & Tate, 2013).

It is also important to highlight that many patients stated that they obtained a great benefit from physical activity. Physical activity has been reported in earlier studies to be important in improving mental health, both when it comes to persons with mental illnesses and the general population (Richardson et al., 2005; Saxena, Van Ommeren, Tang, & Armstrong, 2005). Physical activity is beneficial for reducing physical problems, anxiety, and depression and improving well-being (Saxena et al., 2005). Patients with substance use disorders also benefit from physical exercise (Mammen & Martinsen, 2010). Behavioral activation is known to be associated with a reduction in anxiety and depression symptoms (Dimidjian et al., 2006), in addition to serve as positive reinforcement in obtaining a lifestyle without substance use.

Further, the results showed that the patients received help to improve their relationships with other people. With respect to social relationships and contact with others, the patients also reported great benefit from the support of co-patients and group therapy and from help in coping with problematic social situations. This is in accordance with the most frequent interventions provided by the treatment personnel, which target the improvement of the relationships with family and important others. Social support and interaction with others is important to help reduce the patient’s the risk of substance use after treatment (Broome, Simpson, & Joe, 2002). Co-patients experiencing the same difficulties and struggles with making changes in their behavior could provide important support in the recovery process, and social support is also considered to be an essential part of the 12-step program (Fiorentine & Hillhouse, 2000; Galanter, 2007). Combining 12-step programs and substance use disorder treatment is also associated with high rates of abstinence (Fiorentine & Hillhouse, 2000).

Differences were found between patients with and without co-occurring mental disorders regarding domains of help received and benefits of different types of treatment. Patients with co-occurring disorders reported receiving significantly more help in domains related to self-esteem and coping with psychiatric symptoms and greater benefit from treatment involving coping with different social situations, acute help, and improving their psychological health. These differences indicate that patients with co-occurring disorders and patients without mental health problems have different treatment needs in some domains.

Overall, most of the patients in this study were satisfied with their treatment. This supports earlier findings that patients are highly satisfied with substance use disorder treatment (Chan, Sorensen, Guydish, Tajima, & Acampora, 1997). The patients in our study, however, were somewhat more satisfied with the knowledge and competence of the treatment personnel related to substance use problems than to psychiatric problems. This is an important but not surprising finding. The primary goal in substance use disorder treatment is to treat substance disorders. In order to be able to help and treat people with substance use disorders, treatment personnel typically have substance use problems as their area of expertise and may have varying levels of knowledge in psychiatric issues. Finally, patients also reported feeling a high degree of influence on their own inpatient treatment and aftercare plans. Such patient involvement probably influences and improves the recovery process (Thorncroft & Tansella, 2005).

Limitations
This study had a relatively small sample, with 85 patients in total. Because we were not able to compare study participants with study refusals, there is a possibility of a selection bias. Data concerning psychiatric diagnosis were based upon the ICD-10 diagnoses in the patients’ charts, as reported by treatment personnel, and were not collected through structured diagnostic interviews. Because of the small sample size in this study there is a risk of making Type II errors. The domains in which help was given, and the areas in which patients perceived they benefited most, could vary between...

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patient cohorts and treatment clinics. The patients were asked how much help they received and how much benefit they got from the treatment related to certain domains, but ideally they should also have been asked about their treatment needs, preferences, and desires. The addition of this kind of information would have given an indication about whether the patients received the treatment they felt they wanted and needed. The reports from treatment personnel about delivered treatment were not validated, nor were the patients’ perceived benefits assessed by observation or validated assessment instruments. Using this kind of validation and assessment would have improved the objectivity of the data. Despite the limitations, the results are interesting and should be tested further in a larger sample.

Conclusion

Patient self-reports suggest that social skills and improvements in both the psychological and the physical health domains are treatment components that patients value and believe they benefit from. Patients with co-occurring disorders reported that they received more help with coping in different social situations and with psychiatric symptoms and that they benefited more from the work with psychological health than patients with only substance use disorders. There are some differences between these patient groups, and treatment clinics should be aware of the possibility of different needs. Nevertheless, patients with co-occurring disorders report benefits from and help with many of the same domains as patients with only substance use disorders.

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DISCLOSURES

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REFERENCES


