

# Involuntarily admitted patients with substance use disorders

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# **Abstract**

## **Background**

The abuse of alcohol and illegal drugs is an important and clinically challenging aspect of the management of patients in psychiatric hospitals. Many of these patients have comorbid mental illness, which can complicate the treatment course. The patients might end up being sent between addiction units, psychiatric wards, and somatic hospitals. In Norway, some of these patients are admitted and treated involuntarily in hospitals, pursuant to either the Mental Health Care Act or the Social Services Act. The ethical questions surrounding involuntary admission are a growing concern, and the subject has not been studied sufficiently. Therefore, this thesis focuses on substance use disorders (SUDs) and involuntary admission.

## **Study aims**

The overall objective of this thesis is to investigate the relationship between substance use patterns and involuntary admission to hospitals in different settings pursuant to two different laws. First, we describe and compare involuntarily admitted (IA) and voluntarily admitted (VA) patients with SUDs according to sociodemographic characteristics. Second, we examine whether typical patterns of diagnostic comorbidity exist in association with involuntary admission. We also investigate factors associated with the involuntary admission of patients with SUD.

## **Materials and methods**

Study 1 was a cross-sectional, national multicenter study of SUD in 3,506 patients admitted to adult acute psychiatric wards. Study 2 was a regional, comprehensive 2-year follow-up study carried out in a select population of patients with first episode psychosis (FEP). Patients in Studies 1 and 2 were admitted to psychiatric wards pursuant to the Mental Health Care Act. Study 3 was a cross-sectional, regional study comparing patients with SUD who were IA or VA to addiction treatment centers pursuant to the Social Services Act. The Diagnostic and Statistical Manual of Mental Disorders (DSM)-IV, the International Classification of Diseases (ICD)-10, the Global Assessment of Functioning (GAF) instrument, Clinician Rating Scale (Alcohol and Drug Use Scale), Symptom Checklist-90-R (SCL-90-R), and Addiction Severity Index (ASI) were used.

## **Results**

In all three studies, the majority of patients were male, relatively young between 20-30 years of age, and relatively few were living with a partner. The number of patients with comorbid SUD and mental health disorder were relatively high. In Study 1, we found that approximately one-third of the patients admitted to acute psychiatric wards had a comorbid disorder, but fewer FEP patients had comorbid SUD (Study 2). The largest difference between IA and VA patients was found among FEP patients, with comorbidity being much more frequent among IA patients. SUD among patients with FEP was significantly associated with involuntary admission. Among patients IA and VA to addiction treatment centers (Study 3), we found that comorbidity was frequent in both groups. Demographic characteristics (i.e., gender, sources of income) and the

severity of drug use (i.e., injecting drugs, overdoses) predicted involuntary admission to an institution, not the presence of mental disorders or SUD.

### **Discussion and conclusion**

Comorbid SUD and mental disorders renders treatment more difficult and presents a major challenge to health service providers, indicating the need to diagnose and treat these patients within a highly competent system. Therefore, clinical routines that better identify SUD among patients receiving care for mental health disorders should be given higher priority, as many of the patients would likely benefit from integrated specialist services including mental health, somatic health, and SUD treatment.



## **Norwegian summary (norsk sammendrag)**

### **Bakgrunn**

Misbruk av alkohol og illegale rusmidler er et viktig og klinisk utfordrende problem i behandlingen av pasienter i psykiatriske sykehus. Mange av disse pasientene har en komorbid psykiatrisk sykdom. Dette kan komplisere behandlingsforløpet og pasientene risikerer ofte å bli sendt mellom ulike institusjoner, som rusbehandlings enheter, psykiatriske og somatiske sykehus. I Norge blir noen av disse pasientene tvangsinnlagt på sykehus enten etter Lov om psykisk helsevern eller etter Lov om sosiale tjenester. Det er en økende bekymring rundt de etiske spørsmålene knyttet til bruk av tvang i psykiatrien, men problemet har ikke blitt tilstrekkelig undersøkt tidligere i denne pasientgruppen. På bakgrunn av dette, fokuserer denne avhandlingen på tvangsinnleggelse av pasienter med ruslidelse.

### **Forskningsmål**

Hovedmålet med avhandlingen er å undersøke sammenhengen mellom rusmiddelbruk og tvangsinnleggelse i ulike institusjoner etter de to nevnte lover. Først har vi beskrevet og sammenlignet tvangsinnlagte og frivillig innlagte pasienter med ruslidelse i forhold til sosialdemografiske karakteristika. Deretter undersøkte vi om det var typiske komorbiditetstrekk mellom ruslidelse og psykiske lidelser knyttet til tvangsinnleggelse. Vi har også undersøkt hvilke faktorer som var assosiert med tvangsinnleggelse av pasienter med ruslidelse.

## **Material og metode**

Studie 1 er en nasjonal, multisenter tværnittsstudie av ruslidelser blant 3,506 pasienter innlagte i akuttpsykiatriske avdelinger. Studie 2 er en regional, 2-års oppfølgingsstudie utført i en utvalgt populasjon av pasienter med første episode av psykose (FEP). Pasientene i Studie 1 og 2 ble innlagt i psykiatriske avdelinger etter Lov om psykisk helsevern. Studie 3 er en regional tværnittsstudie som sammenligner tvangs- og frivillig innlagte pasienter med ruslidelse etter Lov om sosiale tjenester i tre norske rusbehandlingsinstitusjoner.

Vi brukte diagnostiske manualer som DSM-IV for psykiske lidelser og ICD-10 for internasjonal klassifisering av sykdommer, Symptom Checklist-90-R (SCL-90-R) instrument og Global Assessment of Functioning (GAF) instrument, dessuten Clinician Rating Scale og den europeiske Addiction Severity Index (EuropASI) for gradering av alkohol- og narkotikabruk.

## **Resultat**

I alle tre studiene var flertallet av pasientene unge menn i alderen 20-30 år, og relativt få var gifte eller samboere. Antall pasienter med komorbid ruslidelse og mental lidelse var forholdsvis høyt. I Studie 1 fant vi at omtrent en tredjedel av pasientene som ble innlagt i akuttpsykiatriske avdelinger hadde en komorbid ruslidelse. Det var færre med komorbid ruslidelse blant FEP pasientene (Studie 2). Den største forskjellen mellom tvangs- og frivillig innlagte pasienter fant vi blant FEP pasientene. Komorbiditet var mye hyppigere blant de tvangsinnlagte pasientene og ruslidelse hos pasienter med FEP var signifikant assosiert med tvangsinnleggelse. Blant tvangs- og frivillig innlagte pasienter til rusbehandling (studie 3) fant vi høy

komorbiditet i begge gruppene (60% vs. 75%). Demografiske karakteristika som kjønn (kvinner, mottakere av trygdeytelser, tung rusbelastning og svekket fysisk helse var sterkere assosiert med tvangsinnleggelser enn psykiatriske diagnoser. Mens menn dominerte blant tvangsinnlagte pasienter med ruslidelser etter Lov om psykisk helsevern, var det relativt flere unge kvinner innlagt etter Lov om sosiale tjenester.

### **Diskusjon og konklusjon**

Komorbiditet med samtidig rus og psykisk lidelse vanskeliggjør behandlingen. Komorbiditet representerer derfor en stor utfordring for helsevesenet. Det er behov for å diagnostisere og behandle disse pasientene i et system med høy faglig kompetanse. Kliniske rutiner for å identifisere ruslidelse blant pasienter som mottar psykiske helsetjenester bør derfor gis høyere prioritet fordi mange av pasientene vil ha nytte av integrerte spesialisthelsetjenester innen mental helse, somatisk helse og tverrfaglig, spesialisert rusbehandling.

## **Preface**

When I was working as a nurse in infectious disease wards, I met patients with SUDs and was troubled by the fact that some of them left the ward even though they had a deadly disease. I often wondered what we could do to help these patients. One moment the patients wanted help, but the next moment persuading them to stay in the hospital was impossible, even when they were being treated for life-threatening infections, such as endocarditis. I felt powerless when I saw these patients leave the hospital looking for the next shot of heroin. I wished there was a miracle cure that could help them out of the captivity of abuse and motivate them to take care of their own physical and mental health. Involuntary admission of these patients was never considered as an option in that clinical environment.

My interest in this research topic started when I was a member of the hospital research committee and reading applications for research funding. Øistein Kristensen, a fellow member of the research committee, introduced me to the topic of involuntary admission. First, I was doubtful that this was a good idea. Could involuntary admission really help these patients, or was it just used as an excuse to “store” unwanted people and to remove an unpleasant sight from the public? The answers to these questions were not easily available, as no evaluations of the treatment outcomes in Norway were available.

When I first started this research project, the goal was to investigate factors related to the involuntary admission of patients to addiction wards pursuant to the Social Services Act. The original project plan was a longitudinal study with a 6-month follow-up to evaluate long-term treatment outcomes. The law has been in limited use; therefore, data collection took longer than initially anticipated. As relatively few

patients were admitted to the wards, we were curious if the patients with comorbid substance use disorder and psychiatric disorder might be somewhere else. Could they have been involuntarily admitted to mental health institutions instead of addiction treatment centers? We were privileged to get access to two other data collections, resulting in papers I and II, with which we could explore this phenomenon in different patient populations while collecting data for the original project. Data collection for the original protocol (paper III) was completed in April 2012, including follow-up data. However, in this thesis, only data from the baseline data collection were included in paper III. The information on long-term outcomes from this study will be presented in forthcoming publications.

As far as we know, this is the first Norwegian thesis in psychiatry investigating both involuntary admittance and substance use disorders. Previous research has focused only on admittance to mental health care or comorbid substance abuse and mental illness, but there is a lack of knowledge regarding the combination of the two topics, substance use disorders and involuntary admissions.

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*Anne Opsal*

## Abbreviations

ASI	Addiction Severity Index (1)
DUP	Duration of untreated psychosis
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th Revision (2)
FEP	First episode psychosis
GAF-F	Global Assessment of Functioning Scale, social functioning version (3)
GAF-S	Global Assessment of Symptoms Scale, symptom version (3)
IA	Involuntarily admitted
ICD-10	The International Statistical Classification of Diseases and Related Health Problems, 10th Revision (4)
MAP	Multicenter study on acute psychiatry (5)
PANSS	Positive and Negative Syndrome Scale (6)
SUD	Substance use disorder
VA	Voluntarily admitted



## List of papers

- Paper I      Opsal A, Kristensen Ø, Ruud T, Larsen TK, Gråwe RW, Clausen T:  
Substance abuse in patients admitted voluntarily and involuntarily to  
acute psychiatric wards: a national cross-sectional study. *Norsk  
Epidemiologi* 2011, 21(1): 85-91.
- Paper II     Opsal A, Clausen T, Kristensen O, Elvik I, Joa I, Larsen TK: Involuntary  
hospitalization of first-episode psychosis with substance abuse during a  
2-year follow-up. *Acta Psychiatr Scand* 2011, 124(3): 198-204.
- Paper III    Opsal A, Kristensen Ø, Larsen TK, Syversen G, Rudshaug EBA, Gerdner  
A, Clausen T: Predictors of involuntary admissions among non-psychotic  
patients with substance use disorders and comorbidity: a cross-sectional  
study. Submitted manuscript.



## 1. Introduction

In this thesis, substance-using patients involuntarily admitted (IA) to hospitals were investigated in different settings. First, we investigated patients admitted to acute psychiatric wards according to substance use disorder (SUD) and the legal basis for admission. In the second study, IA patients with first-episode psychosis (FEP) and SUD were examined. In the third study, we investigated SUDs among patients IA to addiction treatment units.

In these studies, two different diagnostic systems were used to define the patients' mental disorders and substance use patterns: the Statistical Manual of Mental Disorders (DSM) by the American Psychiatric Association (2) and the International Classification of Diseases (ICD) by the World Health Organization (4). In Norway, the ICD is mandatory in clinical use, whereas the DSM is often used in scientific research. In these studies, the term substance abuse was used in papers I-II. In paper III and this thesis SUD has been used. The latter includes harmful use, substance abuse and substance dependence (2). In DSM-IV, the conditions are formally diagnosed as one or the other, but the new DSM-V has proposed to combine the two into a single condition, SUD (7).

According to DSM-IV, substance abuse is a pattern of substance use leading to significantly impaired functioning. One of the following must be present within a 12-month period:

- Recurrent use resulting in a failure to fulfill major obligations at work, school, or home.

- Recurrent use in situations that are physically hazardous (e.g., driving while intoxicated).
- Legal problems resulting from recurrent use.
- Continued use despite significant social or interpersonal problems caused by substance use.

The symptoms do not meet the criteria for substance dependence, which includes the substance use history. Three or more of the following seven requisites should have been met during the same 12-months period

- Increase in tolerance (more of the drug is needed to achieve the same effect).
- Withdrawal symptoms.
- The substance is often taken in larger amounts or over a longer period than was intended.
- There is a persistent desire or unsuccessful efforts to cut down or control substance use.
- A great deal of time is spent in activities necessary to obtain the substance.
- Important social, occupational, or recreational activities are given up or reduced.
- The substance use is continued despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by the substance.

ICD-10 (4) section F10-F19 “Mental and behavioral disorders due to psychoactive substance use” contains a variety of disorders of different severity and clinical form, all including the use of one or more psychoactive substances, which may or may not have been medically prescribed. The substances specified are alcohol, opioids, cannabinoids, sedatives or hypnotics, cocaine, other stimulants including caffeine, hallucinogens, tobacco, and volatile solvents. The clinical states that can occur include acute intoxication, harmful use, dependence syndrome, withdrawal syndrome (state), withdrawal state with delirium, psychotic disorder, late-onset psychotic disorder, and amnesic syndrome (8). A definite diagnosis of dependence is usually made if three or more of the following were present together at some time during the previous year:

- A strong desire or sense of compulsion to take the substance.
- Difficulties controlling substance-taking behavior in terms of its onset, termination, or level of use.
- A physiological withdrawal state when substance use has ceased or been reduced, as evidenced by the characteristic withdrawal syndrome for the substance or use of the same (or closely related) substance with the intention of relieving or avoiding withdrawal symptoms.
- Evidence of tolerance, such as increased doses of the psychoactive substance being required in order to achieve effects originally produced by lower doses; clear examples of this are found in alcohol- and opiate-dependent individuals who may take daily doses sufficient to incapacitate or kill non-tolerant users.

- Progressive neglect of alternative pleasures or interests because of psychoactive substance use, increased amount of time is needed to obtain or take the substance or to recover from its effects.
- Persisting with substance use despite clear evidence of overtly harmful consequences, such as harm to the liver through excessive drinking, depressive mood states consequent to periods of heavy substance use, or drug-related impairment of cognitive functioning; efforts should be made to determine that the user is actually, or could be expected to be, aware of the nature and extent of the harm.

### **1.1 Substance use disorders and mental illness**

An SUD with alcohol or illegal drugs is an important and clinically challenging aspect of the management of patients in psychiatric hospitals. Many of these patients have a comorbid mental illness (9-11), and deciding which problem came first could be difficult (12). Drug-using patients are reported to have a higher risk of violent behavior (13) and to be hospitalized, homeless, or in jail (14). Some studies have revealed that these patients tend to have a higher risk of suicide or sudden death (15-17), and poorer treatment compliance (18). These factors can complicate the treatment course and the patients often end up being sent between addiction units, psychiatric wards, and somatic hospitals. Substance abuse has been known for centuries (19, 20). Today, substance abuse is commonly seen as a disease, as well as a social problem and problem of public order and security, or a combination of these. In this study, SUD refers to substance abuse and substance dependence, including both alcohol and illicit drugs.

## 1.2 Autonomy

In psychiatry and social services, caregivers primarily try to treat patients voluntarily (21, 22) but sometimes feel required to restrict freedom and use involuntary treatment. The ethical questions related to the use of involuntary treatment are a growing concern, particularly when it is used pursuant to the Mental Health Care Act. Freedom of choice and patient rights are important ideals in today's Western society, even though compulsory practices are still relatively common in mental health care. Involuntary treatment is ethically problematic because it involves acting against an individual's autonomy. Autonomy is the capacity to make an informed, voluntary decision. The ability of the individual to make his/her own choices has been perceived as the basic foundation of social freedom and moral responsibility (23). The opposite is paternalism, which involves acting against other people's choices and will for their own benefit or to prevent them harm (24).

### 1.2.1 Autonomy of SUD patients

Standard definitions of SUD cite loss of control, powerlessness, and unmanageability (25). SUD patients who are truly addicted to alcohol or drugs may not have the full capacity to be self-determining or autonomous at all times (26). Therefore, involuntary treatment may be justified, even for only a short period, if treatment can remove the powerlessness and loss of control caused by the compulsive drug-taking habits consequent to SUD (26). SUD patients with comorbid mental illnesses and disabilities are not always incompetent in terms of autonomy. Indeed, to function as a drug-dependent person, the individual must be able to reason, remember complex information, set goals, and be orientated to time, place, and personal identity, but

competency by itself is not sufficient for autonomy. Being competent is a part of autonomy, but autonomy also requires freedom from coercion (27). In 2008, Arthur Caplan wrote an editorial in “Addiction” (26) about the paradox of forcing treatment upon SUD patients: “Many would argue that the most significant achievement deriving from bioethics in the past 40 years has been to replace a paternalistic model of health provider–patient relationships with one that sees patient self-determination as the normative foundation for practice. This shift away from paternalism towards respect for self-determination has been ongoing in behavioral and mental health as well, especially as it is reflected in the ‘recovery movement’...Mandatory treatment which relieves the coercive effects of addiction and permits the recreation or re-emergence of true autonomy in the patient can be the right thing to do.”

In some mental disorders, including active phase psychoses, mania, and melancholic depression, the patient may have reduced ability to make autonomous decisions. Thus, a dilemma exists, and the pendulum has recently shifted towards more focus on personal autonomy. However, many countries still practice some form of involuntary treatment for SUD patients as an option of last resort (28, 29). Evidence-based benefits of such interventions, outweighing the negative aspects of coercion, are needed to justify involuntary treatment.

### **1.3 Involuntary admission to treatment**

Many concepts describe involuntary treatment in the literature, such as, compulsory treatment, detention, coercion, involuntary care and incarceration. They may be used in different settings and given different meaning. In this thesis, I chose to use the terms involuntary admission, involuntary treatment, and coercion. All IA patients included in the 3 studies were admitted to psychiatric hospitals with professional staff



and received treatment including detoxification and providing supportive environment during the stay; therefore I chose involuntary treatment rather than involuntary care. The Social Services Act does not provide access to the use of seclusion, restraint, or involuntary medication. Therefore, this kind of treatment is not a focus of this study. I use the authors' original terms in direct quotes.

In Norway, voluntariness is the dominant principle in the treatment of patients with SUD, but an option exists for involuntary admission to hospitals, if necessary, according to the two different laws mentioned below.

According to the Norwegian Mental Health Care Act (§§ 3.2 and 3.3), compulsory psychiatric mental health care may occur when the patient is suffering from a suspected or established serious mental disorder (psychosis) in order to prevent severe deterioration of the patient's health status or in cases in which an obvious threat exists to the patient's own life or the life of others (22). In such cases, the patient may have reduced ability to make his or her own decision, i.e. reduced autonomy. Involuntary admission can only occur following examination by a physician. The hospital psychiatrist on duty examines the patient and accepts or rejects the referral. Within 24 hours, a psychiatrist or clinical psychologist makes the final decision on the legal basis for admission. When a patient is accepted for involuntary admission, it is as either observation, which can be extended up to 20 days, or long-term detention for an indefinite period of time. To protect the patient's personal autonomy, § 4-2 states that "restrictions and use of coercion shall be restricted to the absolute minimum", and that "the patients' views are to be considered". Interventions may be used only when the positive effects of the intervention clearly outweigh its negative effects. In addition, when treated in an

institution, patients should make their own decisions regarding admission whenever possible (22). Many patients IA with serious mental disorders according to the Mental Health Care Act also have extensive problems with alcohol or drug abuse. However, problems with SUD alone are not sufficient for involuntary admission pursuant to the Mental Health Care Act if patients are not suffering from a psychosis.

The other law, the Norwegian Social Services Act (§ 6.2), warrants involuntary interventions for non-psychotic adult patients with SUD (21). Municipal social services prepare the preliminary file, which is then submitted to the county social welfare board that makes the final decision regarding the application of involuntary treatment. The act covers an option for retention (up to 3 months) when the health of the patient is seriously at risk because of extensive and prolonged substance use and voluntary efforts have been shown to be insufficient. A separate provision on the detention of pregnant women suffering from alcohol or drug abuse, § 6.2a, can be ordered out of concern for the welfare of the unborn child. The law was updated in 2012 (30).

#### **1.4 International practice**

A study by Israelsson and Gerdner based on three WHO reports published 1986 - 2001 found that 73 of 90 (82%) countries worldwide have laws on the involuntary treatment of substance abusers (29). The median duration of hospitalization for involuntary treatment was 2 years. According to the reports, the WHO defines compulsory treatment as treatment that do not require the person's informed consent and excludes treatment that require informed consent within or as an alternative to being confined to prison. Three main legislative domains have been described as foundations for the mandated treatment of SUD patients: mental health care acts or

social services acts (in combination called civil commitment), and criminal justice acts. Although most countries may apply one or more of these acts to patients with SUD, not all countries provide all three alternatives (28). The majority of the countries use civil commitment, acute or rehabilitative, in accordance with welfare reasoning, whereas a minority of countries still use commitment under criminal law based on moral reasoning. Civil involuntary treatment is positively related to countries with strong economies or countries that were part of the former Soviet legal system. Involuntary treatment under criminal law is negatively related to the same factors and is still common in developing countries around the world (29).

Israelsson also analyzed predictors of laws on involuntary admission to institutions and the types of legislation in 38 European countries (28). He found that a majority (74%) of the countries he evaluated had a law on involuntary treatment. The most common type of law was criminal justice legislation (45%), but civil law occurred almost as frequently (37%). According to Israelsson, these two models of legislation are related to differences in cultural heritage and welfare distribution models. Countries with a history of a strong temperance movement or a distribution of welfare through the state tend to favor civil law, whereas countries with a welfare distribution through insurance with less state interference now tend to favor criminal justice legislation (28). Israelsson provided an overview of the various laws used in Europe (Fig. 1).

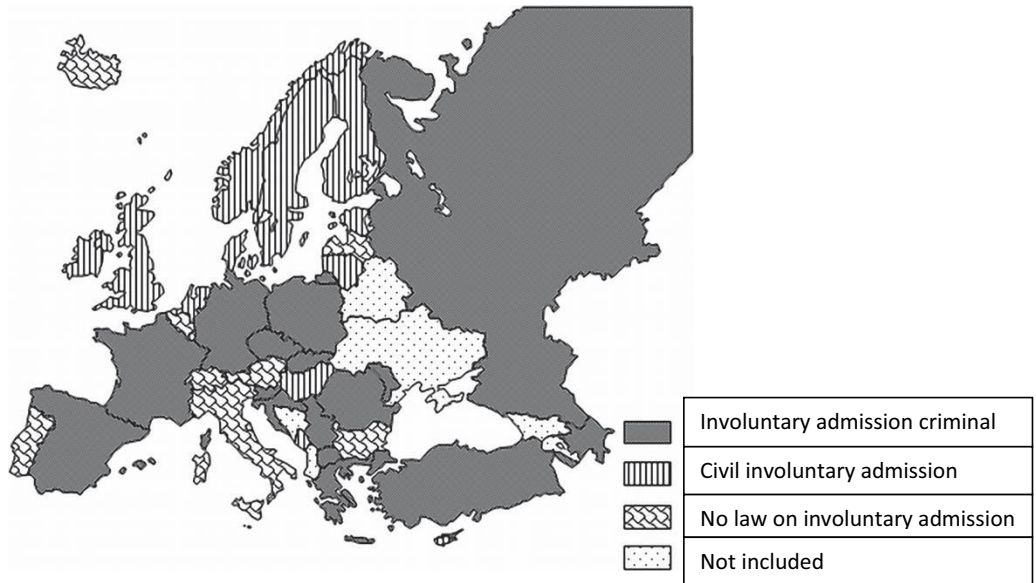


Figure 1. Dominating laws on involuntary admission in Europe (28) (Printed with permission from S. Karger AG).

### 1.5 Prevalence of involuntary admissions in Norway

In 2010, approximately 8300 involuntary admissions were made to mental health care units in Norwegian hospitals according to the Mental Health Care Act. This constitutes 22% of all adult inpatients in mental health services (31). Despite the government's efforts to reduce the use of involuntary treatment in mental health care, the numbers have remained unchanged in recent years. Thirty nine percent of the IA patients had schizophrenia as their main condition, and involuntary treatment often seems to be linked to this patient group (31). Approximately one out of three patients IA to mental health care hospitals had a SUD (10, 11, 32). To what degree these patients actually had a severe mental disorder in addition to SUD is not known.

In 2010, only 106 decisions were made for involuntary admission to addiction units in Norway according to the Social Services Act. The number of such decisions increased between 1993 and 2010, but the number is still relatively low (Fig. 2) (33).

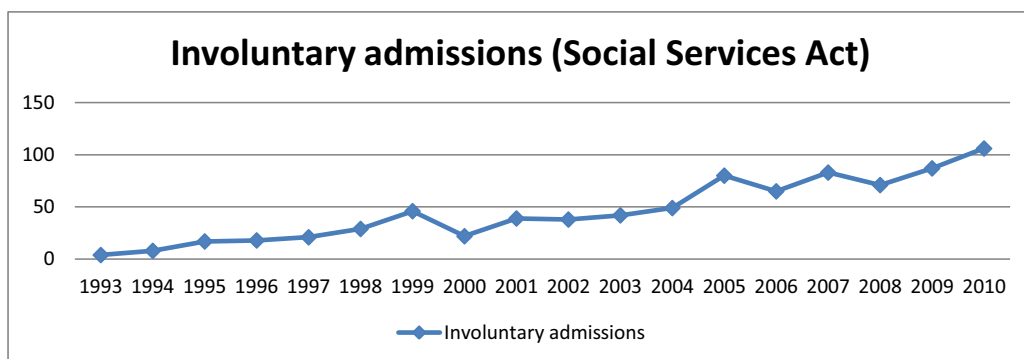


Figure 2. Number of patients involuntarily admitted pursuant to the Social Services Act from the introduction of the law in 1993 to 2010 based on data from SiRUS, The Norwegian Institute for Alcohol and Drug Research (33).

Significant differences exist in the use of involuntary admission according to both the Mental Health Care Act and the Social Services Act between and within different health regions. Theoretically, such differences could be explained by differences in population morbidity, but they more likely reflect differences in admission practices. Uncertainties also existed in the number of patients reported due to different and incomplete reporting praxis in different health regions (31, 34).

In comparison, 1024 Swedish patients were IA during 2010 (population of 9.4 million compared to Norway's 5 million) pursuant to the Swedish Social Services Act (35). In Denmark, SUD patients are restrained only by contract (36). However, similar to Norway, Denmark does have a mental health care act limiting the stay to 15 days, but the stay can be extended. The law may be used for alcohol- and drug-related psychoses (37). The map in Fig. 1 shows that Iceland does not have any law allowing coercion of SUD patients in treatment institutions.

## **1.6 Norwegian perspective and political guidelines**

In 2006, Norwegian politicians launched a national health plan to ensure quality and reduce the use of involuntary admission in mental health care (38). During the last few decades, focus on patients' rights, empowerment, and participation has increased. Emphasis on individual autonomy and integrity has become the new trend (23). Patient involvement, at both the individual and system level, has become more common (39). Focus has also been placed on how health care providers can organize themselves in the most appropriate way to reduce involuntary admission through increased access to mental health services in emergency situations (40), systematic monitoring of patients with a history of long and complex mental disorders, and increased emphasis on patients' expertise in the design of treatment (38). The ability to reduce the use of involuntary admissions via legislative changes has also been considered, including whether to remove or change the treatment criteria. The current recommendation is that treatment criteria should be retained (41). The call for reductions in involuntary admission has, to date, not been based on scientific research. In Norway, no studies have shown that the use of involuntary admission is too high or applied inappropriately; however, the numbers of IA patients are consistently high. Most people would agree that agitated mania, psychosis, including homicidal psychosis, and severe depression require involuntary admission in some cases, but at the same time the level of involuntary admission should be kept as low as possible. Despite increasing focus both in Norwegian media and among politicians regarding IA patients, little has been said and done concerning the patients IA pursuant to the Social Services Act. This law was established in 1993 and revised in 2012, but little research has been done in the field to evaluate the

outcomes of the treatment, and no official guidelines are available on how to apply the law. However, one governmental report has focused on the importance of a more correct and consistent use of involuntary admission within the Social Services Act (42).

We currently do not know much about the characteristics or outcomes of the patients IA pursuant to the Social Services Act. Are there more mental illnesses among patients with SUD who are IA than among those who are VA, or do IA patients experience more severe drug problems? Do IA patients with SUD have a greater burden of social problems or somatic diseases? Why are some SUD patients IA whereas others are not?

## **1.7 Previous research**

### *1.7.1 Study designs in the field of involuntary treatment*

Involuntarily admitted SUD patients are generally a neglected group in the research literature. A review of relevant research on this issue includes both the Social Services Act and Mental Health Care Act. Due to ethical reasons, few randomized efficacy studies have focused on the involuntary admission of persons with SUDs. Randomizing patients into a group of IA patients who receive treatment and a group that does not receive treatment is difficult, though some examples exist (43). Therefore, other study designs are primarily used when such issues are explored. Often a comparison is made with voluntarily treated patients. The alternative to treating IA patients is normally not the treatment of VA patients, but no treatment at all (43). Most countries have their own legislation concerning involuntary admission to the hospital for patients suffering from an SUD alone or combined with mental

disorders. Therefore, legal and cultural differences make direct comparisons of studies across national boundaries difficult, and even comparisons between the Nordic countries. Clinical experience, resources, traditions, and attitudes vary considerably, even within the same country (23, 34, 44). Therefore, research should be performed locally to evaluate the local (national) outcomes of treatment practices and to guide policy in the field.

### *1.7.2 International studies*

Wild et al. (2002) studied research trends in IA patients with SUD and presented an overview of a sample of 170 English language articles (45). Roughly half of the studies were non-empirical (e.g., literature reviews, policy proposals, legal and ethical commentaries on involuntary treatment). The reviewers reported on 18 quantitative comparative and longitudinal studies: eight studies were related to legal mandates, mainly involving offenders mandated to undergo or IA to treatment through the criminal justice system; five studies were formal mandates via coercion outside the criminal justice system (e.g., via the employer, welfare system); three were informal mandates (e.g., family, group persuasion); and two were mixed mandates (e.g., employers, informal family, court mandated). The studies were related to coercion or offenders identified through the criminal justice system.

The reviewers reported that mandated treatment generally demonstrated better outcomes in terms of the treatment process (i.e., uptake of treatment following referral). The findings indicated more equivocal results for retention rates, with 6/11 studies reporting higher participation for clients receiving compulsory treatment than those receiving non-compulsory treatment. In terms of substance use outcomes, two of eight studies found superior outcomes for clients receiving compulsory treatment



compared to voluntary treatment, whereas the other six studies reported no difference in benefits. However, the outcomes of mandated treatment demonstrated in these reports might not necessarily be the same as for patients involuntarily admitted pursuant to the Norwegian laws.

Broadstock et al. (2008) commissioned a review of the effectiveness of involuntarily treating SUDs in non-offenders (46). For a comparison, no treatment, voluntary residential treatment, and involuntary outpatient/community-based treatment were included. Four review publications were eligible for inclusion and critically appraised, describing results primarily drawn from the literature on offenders. No primary research paper met the selection criteria for inclusion in the review. From the evidence-based studies that were identified, minimal evidence was available on the effectiveness of compulsory residential treatment of non-offenders alone. Some weak evidence was found to suggest that at least some people benefit from involuntary treatment. Many studies on involuntary treatment in populations that included offenders appear to report comparatively positive outcomes, but others less so. No evidence was found for involuntary treatment having advantages in outcome over voluntary treatment, or for harm by involuntary treatment.

In a Norwegian report, Steiro et al. (2009) evaluated systematic reviews that included international, randomized, and controlled trials of IA patients dependent on opioids (47). The reviewers focused on the effects of the involuntary treatment of persons dependent on opioids and concluded that no study could be included in the review because none evaluated the effect of court-ordered substance abuse treatment in this group of patients. In addition, the design of the studies needed to be of higher

quality and include all phases of the continuum of care, from evaluation and treatment to aftercare.

In Sweden, some relevant research has been performed in the field of involuntary admission. In 2004, Gerdner wrote a systematic review of 32 outcome studies (48), and in 2011, Gerdner and Berglund made an overview of international research studies (43). The main conclusion was that compulsory treatment increases the chances of completing the treatment program and aftercare. The outcomes of involuntary treatment and aftercare were as good as, or even better than, the outcomes of similar voluntary treatment for corresponding groups of patients.

In her 2011 thesis, Lindahl studied court-ordered decisions regarding involuntary treatment of patients with SUD with respect to patients' experiences and the outcome of care (49). The patients' experiences with coercion during the investigation and treatment were studied. A total of 74 subjects who were either assessed prior to the court's decision on involuntary treatment ( $n = 39$ ) or had previous experience with involuntary treatment ( $n = 35$ ) were interviewed. Patients in the assessment group more often reported having the opportunity to express their opinions to the social worker during the assessment period and were more positive towards the final decision than patients from the group with previous experience. The clients who did meet with a social worker often described the conferences as being more of a perfunctory nature with a lack of focus on the actual situation and aftercare planning (50).

Lindahl et al. also carried out a 2-year follow-up, investigating whether the global outcome and mortality differed between patients who resided in municipalities with low or high rates of involuntary treatment (51). The different ratios of involuntary treatment did not influence the global outcome and commitment was concluded to

reduce substance-related deaths.

### *1.7.3 Norwegian studies*

We found two main directions when searching for Norwegian studies from the psychiatric field. The first direction concentrated on the prevalence of SUD in patients with mental health disorders admitted to psychiatric hospitals, the duration of stay, and prognosis, not taking into consideration whether the admission was voluntary or involuntary. A high prevalence of SUD (20-47%) was found among patients in security units and acute psychiatric units (9, 52, 53). Other researchers have used blood and urine tests to increase the detection of alcohol and drugs, finding even higher rates of substance use among patients with mental disorders admitted to acute psychiatric wards (26%-81%) (10, 11, 54).

The second direction in psychiatric research has focused on involuntary admission to psychiatric hospitals. Focus has been placed on the relationship between involuntary treatment and the mental disorder (e.g., prevalence, patient's perceptions, staff attitudes, treatment of the psychosis) with little attention on the comorbid SUD (44, 55-62).

In Norway, research from the addiction field is sparse when it comes to comorbid SUD and mental disorders, especially in regards to involuntary admission pursuant to the Social Services Act. A problem with prevalence research among patients from addiction centers is a lack of the routine use and evaluation of psychiatric diagnoses. A study of comorbid SUD and psychiatric diagnoses, the ROP study (Rus og Psykiatri), in two Norwegian counties using standardized tools found that patients VA to addiction centers had a high lifetime comorbidity of agoraphobia (48%), social

phobia (47%), and depression (44%) (63). Two-thirds of these disorders started at least one year before the SUD (64). In addition, 41% of the patients previously received treatment in psychiatric wards.

A knowledge gap exists concerning involuntary admission pursuant to the Social Services Act. No proper evaluation has been performed regarding the consequences of the law, even though it was introduced almost 20 years ago.

In Søviks' dissertation "Detention of alcoholics or drug addicts – The Norwegian Social Services Act section 6-2 to 6-3", the main question addressed the extent to which the society can prevent unwanted behavior among SUD patients by using involuntary admission (65). He stated that there were no qualifying criteria requiring serious or grave harm and that it is of concern who does make the decisions for involuntary admission to institutions and if it is made according to a fair and proper procedure. A more coherent legislation will hopefully lead to better conditions for growing group of patients with co-occurring SUD and mental diseases. Lundeberg et al. also wrote two reports on the use of the Social Services Act in cases of compulsory intervention among adult patients with SUD (34, 66). They examined the variations in organizational factors, such as leadership, human resources, division of labor, and administrative tools, that determine and limit the extent to which involuntary admission is initiated. The most decisive factor in the application of the law was the intention to help individuals in a life-threatening situation. Social pressures were often an integral part of the process of seeking addiction treatment. Some of the SUD patients did not have any offer to further treatment on voluntary basis when the compulsory treatment was finished, even though they were motivated. If there are no arrangements that secure the patients' rights to further

treatment, the purpose of the detention fails. However, the most critical factor under the present conditions is the legal protection of patients with dual diagnoses.

A knowledge gap still exists when it comes to research focusing on patients with SUD who were IA pursuant to the Social Services Act. We have only been able to find one Norwegian report, from 1998, which showed that patients admitted to an institution according to the Social Services Act were more often females, and that they were younger than the men who were admitted to the ward (67). Most of the patients also used multiple drugs, especially the men, and often had comorbid severe mental disorders.

In summary, we found that research in this field has generally been sparse and that the contributors have been individual researchers and small research groups from a few sites in Europe and the USA. Because laws and procedures are different between different countries, national studies are needed in order to evaluate the effect of involuntary admission. We need to identify which patients benefit from involuntary admission and perform follow-up studies to evaluate the effect of such treatment. Therefore, an evaluation of whether involuntary admission does fulfill its purpose and should be used more or less often is important.

## 1.8 Overall objective and aims

The overall objective of this thesis is to investigate the relationship between substance use patterns and involuntary admission to hospitals in different settings pursuant to two different laws. Study 1 was carried out as a national study of SUD patients in acute psychiatric wards. Study 2 was carried out as a regional study of patients with FEP. The patients in Studies 1 and 2 were admitted to psychiatric wards pursuant to the Mental Health Care Act. Study 3 was a regional study of patients with SUD admitted to addiction treatment centers pursuant to the Social Services Act.

The specific aims are:

1. To describe and compare IA and VA patients with SUD according to sociodemographic characteristics in different settings.
2. Examine whether typical patterns exist in the diagnostic comorbidity of SUD and mental disorders associated with involuntary admission.
3. Investigate factors associated with the involuntary admission of patients with SUD to hospitals.

## 2.0 Materials and methods

### 2.1 Data sources

The papers presented in this thesis are based on data from three different samples. All of the papers focus on patients with SUDs who were IA to an institution. The background, methods, and samples for the three studies are presented below.

Table 1. Summary of study designs.

Study	Design	Legislation	Year of study	Unit	<i>n</i> =
1	National multicenter study, cross-sectional	Mental Health Care Act	2005-2006	Psychiatric hospitals providing acute inpatient treatment	3,506
2	Comprehensive 2-year follow-up	Mental Health Care Act	2002-2005	Acute inpatient ward and outpatient clinics	103
3	Cross-sectional study with comparison of two groups	Social Services Act	2009-2011	Addiction treatment centers	202

#### 2.1.1 SUDs of patients admitted to acute psychiatric wards (Study 1)

This study was part of the cross-sectional Multicenter study of Acute Psychiatry (MAP) in Norway (5). Data collection was carried out as a national cross-sectional study during 2005 and 2006 within a research network of acute mental health services. Data on patient characteristics and treatment episodes were collected from all patients admitted during a 3-month period. The network was organized and coordinated by the research institute SINTEF Health Research in Norway with

support from the Norwegian Directorate of Health and Social Affairs (56, 68). The sample originally consisted of 39 wards, which were categorized into three groups: 4 admission wards, 28 acute wards, and 6 subacute wards. One ward was an intermediate term ward and removed from the sample, resulting in a total of 38 acute wards, which comprised 75% of Norwegian hospitals providing acute inpatient treatment at the time. The clinics were located in both urban and rural areas of the country and assumed to cover a representative sample of the Norwegian population (69). Data were collected from 3,506 admissions to adult acute psychiatric wards. Thirty-five percent of patients were IA to the hospitals (56). According to the Clinician Rating Scale, 1,187 of the 3,506 admissions were patients abusing psychoactive substances prior to admission. We found that 826 (70%) of the admissions were VA patients with SUD and 361 (30%) were IA patients with SUD (Fig. 3).

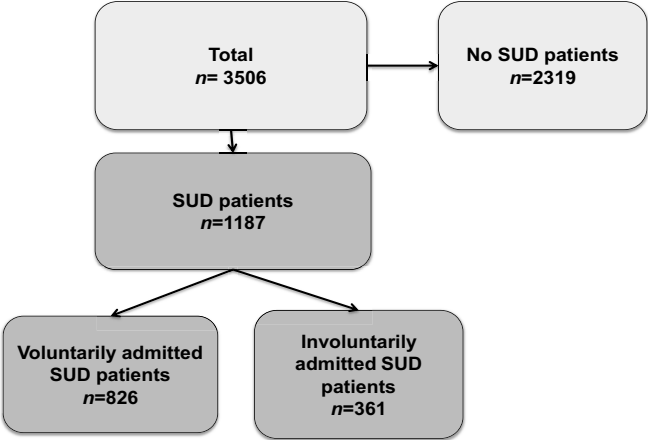


Figure 3. Patients included in the MAP study.



### *2.1.2 Involuntarily admitted patients with first episode psychosis (Study 2)*

A large proportion of psychotic patients admitted to mental hospitals are IA. In Study 2, we wanted to study whether these involuntary admissions were associated with SUD; and if so, whether special issues or characteristics of this population triggered the episodes.

Study 2 included FEP patients in the southern sector of Rogaland County, Norway. Recruitment for the study continued consecutively from January 1, 2002, to June 27, 2005. The criteria for inclusion were as follows:

- Living in the catchment area
- Age 15–65 years
- Meeting DSM-IV (70) criteria for schizophrenia, schizophreniform psychosis, schizoaffective psychosis, delusional disorder, brief psychosis, affective disorder with mood incongruent delusions, or psychosis not otherwise specified
- Being actively psychotic as measured by a Positive and Negative Syndrome Scale (PANSS) (6) score of four or more on at least one of the following PANSS items: P1 (delusions), P3 (hallucinations), P5 (grandiose thinking), P6 (suspiciousness), and A9 (unusual thought content); not previously having received adequate treatment for psychosis (defined as antipsychotic medication of 3.5 haloperidol equivalents for 12 weeks or until remission of the psychotic symptoms)
- No neurological or endocrine disorders related to the psychosis
- No contraindications to antipsychotic medication
- Understanding/speaking the Norwegian language

- IQ over 70 on the Wechsler Adult Intelligence Scale (WAIS)
- Willing and able to give informed consent.

The patients entered the study through the “Early Treatment and Intervention in Psychosis Study” (TIPS-II) low threshold detection team, or were referred to the hospital’s acute inpatient ward or outpatient clinics by local general practitioners or psychiatrists. After a preclinical screening interview, a senior psychiatrist or psychologist examined each patient. Demographics and supplementary information were collected, and a diagnostic interview was conducted. A total of 166 consecutive patients were identified. Twenty-three patients were excluded; nine were not registered in the catchment area, six had poor language skills, six were younger than 15 years of age, and two had a low IQ. Of the 143 remaining patients, 39 refused participation (Fig. 4). Therefore, the rate of consent to participate was 73% (n=104 patients). One patient was excluded later because of missing data regarding drug and alcohol use.

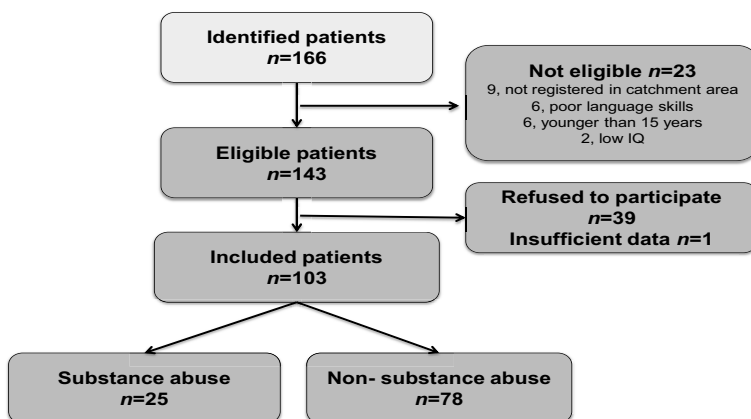


Figure 4. Patients included in the study of first episode psychosis.

The included patients were examined at baseline, after 3 months, and after 1 and 2 years. All patients were assessed by trained personnel within a week of contact and assigned to the standard treatment program, which consisted of an antipsychotic medication algorithm, multifamily work, and active outreach-supportive psychotherapy (71).

### *2.1.3 Involuntary admission of patients to addiction treatment centers (Study 3)*

This study is a cross-sectional study comparing IA and VA patients. The IA patients from three different treatment centers in the southeastern part of Norway were included: Kristiansand, Tønsberg, and Oslo, which have 4, 4, and 3 beds for IA patients, respectively. All of the VA patients were from Kristiansand from the same ward as the IA patients. The wards were multidisciplinary (i.e., psychiatrists, psychologists, social workers, occupational therapists, specialized nurses and other trained staff) and had specialized units that offered treatment for patients with primary SUD, which was often combined with mental disorders (except psychosis). The treatment focused on a structured interview and examination as the basis for a recognized diagnosis according to the ICD-10, pharmacotherapy, cognitive milieu therapy, and individual motivation enhancement for the patients. The population was mainly from urban and suburban areas. Recruitment to the study continued consecutively from January 1, 2008, to May 31, 2011. The criteria for inclusion were as follows: substance abuse or dependence based on ICD-10, age >18 years, understanding/speaking the Norwegian language, and a minimum 3 weeks of treatment.

Before inclusion, patients in both the IA group and VA group were detoxified, verified by negative urine tests for alcohol, opioids, central stimulants (amphetamines, methamphetamines, and cocaine), benzodiazepines, and cannabis or a minimum 14 days spent in detoxification. Patients with mental retardation who were not able to understand the questionnaires were excluded. Pregnant patients were treated in special wards and not included in the study.

A total of 202 consecutive patients were included in the study: 65 IA and 137 VA patients. Among the IA patients, 15 did not meet the inclusion criteria (12 due to too short of a stay and 3 due to low mental capacity), and 11 were not asked to participate due to logistic reasons at the treatment wards. Twelve of the eligible 77 IA patients refused to participate (Fig. 5). Therefore, the rate of consent to participate among IA patients was 84%.

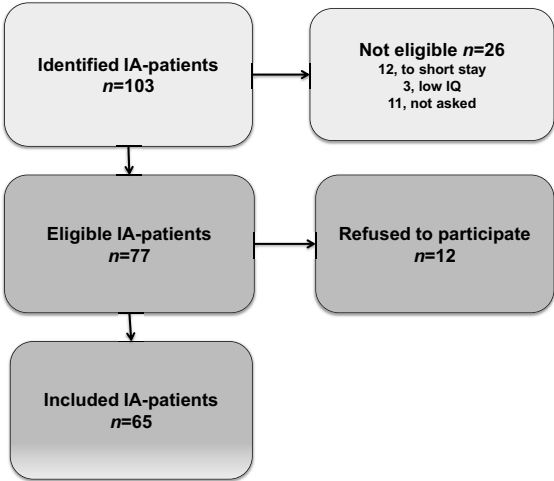


Figure 5. Involuntarily admitted (IA) patients in Study 3.

Among the VA patients, 72 patients were not included (69 due to too short of a stay, 3 due to low mental capacity), and 14 of the 151 eligible VA patients refused to participate (Fig. 6). Therefore, the rate of consent to participate among eligible VA patients was 91%.

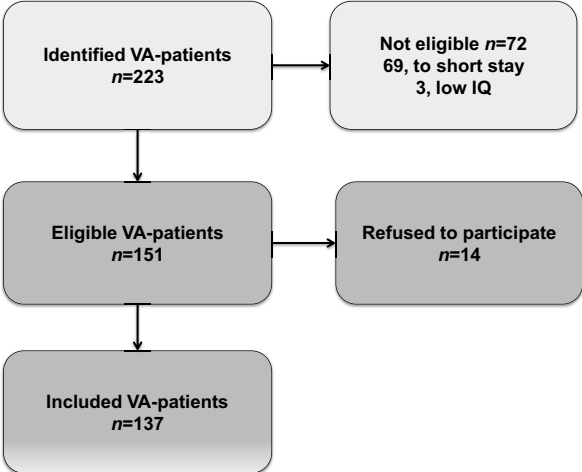


Figure 6. Voluntarily admitted (VA) patients in Study 3.

## 2.2 Study instruments

Table 2. Study instruments used in Studies 1, 2, and 3.

Tool	Method		Study		
	Clinical interview/ observation	Questionnaire	1 SUD patients admitted to acute psychiatric wards	2 Patients diagnosed with first episode psychosis	3 Patients admitted to addiction treatment centers
DSM-IV (SCID)	X			X	
ICD-10 (MINI+)	X		X		X
PANSS	X			X	
GAF	X		X	X	
Clinician Rating Scale	X		X	X	
ASI	X				X
SCL-90-R		X			X

In Norway, two medical classification lists are used to code diseases, signs and symptoms, abnormal findings, complaints, social circumstances, and external causes of injury or diseases: The Diagnostic and Statistical Manual of Mental Disorders, 4th Revision (DSM-IV) (2) and the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10) (4).

The ICD-10 was used for coding mental and behavioral disorders in Studies 1 and 3. The ICD-10 is maintained by the World Health Organization (WHO). In Study 3, all patients were subject to a clinical psychiatric examination supported by the Mini-International Neuropsychiatric Interview (MINI), version 2002. The MINI is a short structured diagnostic interview for the assessment of psychiatric disorders according to the DSM-IV and ICD-10 classification systems (72) with high acceptance and validity (73, 74). The interviews were conducted by senior psychiatrists and

psychologists with many years of clinical and research experience with the psychiatric assessment of patients with physical disorders.

In Study 2, the Structured Clinical Interview for the DSM-IV (SCID) was used for diagnostic purposes (75). This tool is published by the American Psychiatric Association to provide a common language and standard criteria for the classification of mental disorders. SCID is used most extensively in the United States, but also to a varying degree around the world. The current version is the DSM-IV-TR (text revision) and organized into a five-part 'axis' system, with the first axis incorporating 'clinical disorders' and the second covering personality disorders and intellectual disabilities.

The PANSS is used for measuring symptom severity in patients with psychosis and was widely used in the study of FEP (24). In Study 2, we measured the psychotic symptom level using the PANSS. The symptom domains were represented by the corresponding PANSS components: positive, negative, excitement, cognitive, or depressive (25). The duration of untreated psychosis (DUP) was defined as the time from onset of psychosis until the start of adequate treatment. The onset of psychosis was equated with the first appearance of positive psychotic symptoms, defined as the first week with symptoms corresponding to a PANSS score of 4 or more on positive subscale items 1, 3, 5, or 6 or general subscale item 9. All available data sources, including semi-structured personal interviews with patients and relatives, were used to ascertain the length of this period. All raters were trained by rating prepared case notes and audio or videotapes before entering the study assessment teams.

Global Assessment of Functioning (GAF) (3) is a broadly used instrument for assessing the overall mental health of patients and was used in Studies 1 and 2 to rate social, occupational, and psychological functioning. GAF is from axis V in DSM-IV-TR, and recorded values can be either a single score (i.e., only the most severe of the symptom and functioning values is recorded) or separate scores for symptoms (GAF-S) and functioning (GAF-F).

The Symptom Checklist-90-R (SCL-90-R) instrument was used in Study 3 to evaluate the range of psychological problems and symptoms of psychopathology (76). The test contains 90 items, measures nine primary symptom dimensions (somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, anger/hostility, phobic anxiety, paranoid ideation, and psychoticism). The SCL-90-R provides an overview of a patient's symptoms and their intensity during the previous 7 days. Each of the 90 items is rated on a five-point Likert-type scale, ranging from "not at all" (score = 0) to "extremely" (score = 4): higher values indicate greater symptom severity during the past week. The Global Symptom Index (GSI) score was used to assess the overall level of general psychological distress.

In Studies 1 and 2, drug and alcohol use during the 6 months prior to the index hospital admission were assessed by the Clinician Rating Scale (Alcohol Use Scale and Drug Use Scale) (12, 77). This rating scale is used to measure the consumption of psychoactive substances on a scale from 1 to 5 (1 = no use, 2 = use without impairment, 3 = abuse, 4 = dependence, and 5 = dependence with need for institutionalization). The use of psychoactive substances without impairment is defined as "no evidence of persistent or recurrent problems in social functioning,



legal status, role functioning, mental status, or physical status, and no evidence of recurrent dangerous use”. The patients were subsequently divided into two groups:

1. The non-substance abuse group including patients who scored 1 or 2 on the Clinician Rating Scale (for alcohol and/or drugs).
2. The substance abuse group including patients who scored 3, 4, or 5 on the Clinician Rating Scale (for alcohol and/or drugs).

Sociodemographic variables were measured in Study 3 using the European Addiction Severity Index (ASI). This tool is a personal, structured interview designed for both clinical and research purposes that includes seven areas: medical status, employment and support status, drug and alcohol use, legal status, family history, family and social relationships, and psychiatric status (1). Trained and certified staff performed the ASI interviews. Specific substance use patterns were dichotomized into drug consumption at least once a week versus less than weekly.

**2.3 Data analysis**

Table 3. Statistical analyses used in papers I, II and III.

		Paper		
		I	II	III
Statistical analysis	Mean (standard deviation)	X	X	X
	Median		X	
	Chi-square test		X	X
	Student’s t-test	X	X	X
	Fisher’s exact test		X	X
	Wilcoxon Signed Rank test		X	
	Mann–Whitney U-test		X	
	Spearman’s rho		X	X
	Multivariate logistic regression	X	X	X

Continuous variables are reported with means and standard deviations (SDs). Categorical variables are reported as frequencies. The independent sample t-test, chi-squared test, and Fisher's exact test were used to test for significant differences between groups. Data that were not normally distributed were analyzed with a non-parametric test (Wilcoxon Signed Rank test and Mann–Whitney U-test). Logistic regression (enter model) was performed to investigate the relationship between IA and VA patients and specific substance-related diagnoses (Study 1), involuntary treatment outcomes (Study 2), and patient characteristics (Study 3). In Study 2, the DUP did not seem to have a normal distribution, whereas its natural logarithm did. In multiple logistic regression analysis, DUP was transformed to its natural logarithm. Results are presented with 95% confidence intervals (CIs). The continuous variables were checked for correlation with Spearman's rho. None of the continuous variables that were included had a correlation exceeding 0.7. In Study 3, the number of cases in the sample restricted the predictors included in the model. Variables from the univariate analysis with  $P < 0.10$  were included in the multivariate analysis, except in Study 3 "overdoses on drugs" because of multicollinearity with the variable "injecting illicit drugs". The threshold for significance was  $P < 0.05$ . Analyses were performed using SPSS 16.0 or 18.0 Software (SPSS Inc., Chicago, IL, USA).

## **2.4 Ethics**

The Norwegian Directorate of Health and Social Affairs provided permission to collect information from health services. Study 1 was approved by the Regional Committee for Medical and Health Research Ethics and the Data Inspectorate, Oslo, Norway; the National Committee for Research Ethics in Norway (REK 211-04049); and the Privacy Issues Unit, Norwegian Social Science Data Services (NSD no. 11074). The

Regional Committee for Medical and Health Research Ethics approved that data could be collected without asking for consent, as it was considered ethically important to include IA patients independently of consent to participate. The Regional Committee for Medical Research, Ethics Health Region West (REK 015.03) approved Study 2. Study 3 was approved by The National Committee for Research Ethics in Norway, Region South East (REK 08/206d, 2008/2900, 09/2413) and the Privacy Issues Unit, Norwegian Social Science Data Services (NSD no. 18782).

Anonymity occurs when the researchers cannot link participants to their data and is the most secure means of protecting confidentiality. Anonymity was present in Studies 1 and 2. When anonymity is impossible, such as the case in Study 3, patients are given a pledge of confidentiality, which means that the information participants provide will not be made accessible to unauthorized persons outside the project group. Data were kept inside the hospital's secured network for the strictest confidence, and identification numbers substituted participants' names in the computer files.

A superior ethical principle for protecting study participants is respect for human dignity and the right of self-determination, which encompasses people's right to make informed, voluntary decisions about participation. Participants in Studies 2 and 3 received written information. The respondents provided informed consent, which means that adequate written and oral information was provided, and patients were informed that refusing to participate in the study would not interfere or have negative consequences with respect to any aspect of treatment. Written informed consent was obtained from all study participants in both studies. In Study 2, parents or legal guardians gave informed consent for patients younger than 18 years of age.

The ability to provide adequate information is also dependent on whether the recipient is in a state in which they are able to understand the information. For the consent to be valid in Study 3, patients could not be in an acute detoxification phase, which allowed them to be informed in a situation of sufficient cognitive ability and gave them the power to make a free choice concerning study participation. Therefore, to be included in the study, the patients were in treatment at least 3 weeks.

### 3.0 Results

This section responds to the specific aims of the thesis. The results are sometimes presented in a slightly different manner than in the papers I-III. The selection of patients was different in each of the three studies. Study 1 was a large national study of all patients admitted to acute psychiatric wards. Study 2 was a regional study of a selected patient population with FEP. Study 3 was a study of selected patients with SUD admitted to addiction treatment units.

#### 3.1 Aim I

*To describe and compare IA and VA patients with SUD according to sociodemographic characteristics in different settings.*

Baseline sociodemographic variables are presented in Table 4.

Table 4. Baseline sociodemographic variables.

	Study					
	1		2		3	
	SUD patients admitted to acute psychiatric wards		Patients diagnosed with first episode psychosis		Patients admitted to addiction treatment centers	
Patients	Involuntarily admitted	Voluntarily admitted	Involuntarily admitted	Voluntarily admitted	Involuntarily admitted	Voluntarily admitted
<i>n</i> (%)	361 (30)	826 (70)	42 (41)	61 (59)	65 (32)	137 (68)
Male, %	64	63	55	56	52	73
Age, mean years (SD)	37 (12)	34 (12)	25 (10)	26 (10)	29 (11)	31 (9)
Living with a partner, %	15	18	15	16	13	9
Employed, %	9	10	5	23	10	19

In Study 1, we found that two-thirds of both IA and VA patients with SUD were males, with a mean age of 34 years and 36 years, respectively. Only 15% of the IA patients

and 18% of the VA patients were living with a partner, and only 9% of the IA and 10% of the VA patients were employed.

In Study 2, we found that more than half of FEP patients with SUD were males. The patients were relatively young, and few were living with a partner. Among patients with FEP, 23% of the VA and only 5% of the IA patients were employed. However, 29% of the IA patients and 21% of the VA patients reported being students.

We found the largest gender difference in Study 3; 52% of the IA patients were men compared to 73% of the VA patients (Table 4). Thus, in Study 3, female patients were relatively more often IA (48%) than VA (27%) ( $P = 0.004$ ). Only 13% of the IA and 9% of the VA patients were living with a partner, and 10% of IA and 19% of VA patients were employed.

In summary, when comparing the sociodemographic characteristics of patients in the three studies, we found that men constituted the majority of all three samples, regardless of voluntary or involuntary status. Also, the majority of patients were relatively young, between 20-30 years of age. The oldest patient population was found in the national study of patients admitted to acute psychiatric wards (Study 1), and the youngest patients were the FEP patients in Study 2. No significant age difference was found between IA and VA patients. In all three studies, we found that very few patients were living with a partner, employed, or had higher education.

### 3.2 Aim 2

*Examine whether typical patterns exist in the diagnostic comorbidity of SUD and mental disorders associated with involuntary admission.*

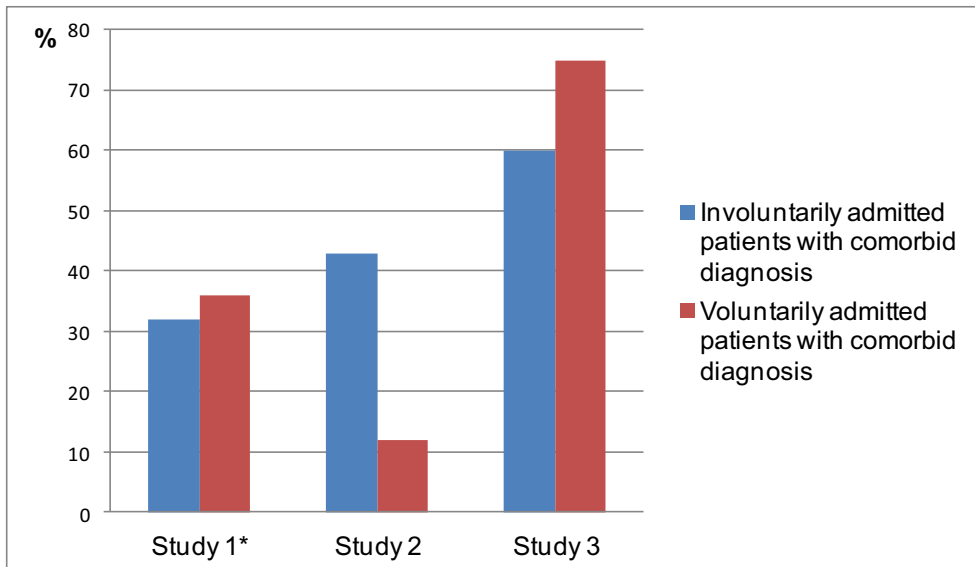


Figure 7. Distribution of involuntarily and voluntarily admitted patients with comorbid SUD and mental health disorders. Study 1 (Patients admitted to acute psychiatric wards), Study 2 (Patients diagnosed with first episode psychosis), Study 3 (Patients admitted to addiction treatment centers). \*Including SUD and non-SUD

In Study 1, we investigated all patients (both SUD and non-SUD) admitted to acute psychiatric wards and found that approximately one-third of the patients had a comorbid SUD and mental health disorder (Fig. 7). We found that the most frequent substance use diagnosis among patients IA to acute psychiatric wards was F19, multiple drug diagnoses (ICD-10). The use of alcohol, stimulants, and opiates was the most frequent single substance use diagnosis. Study 1 provides a general impression of acute psychiatric patients in Norway (mixed with respect to diagnosis). The most frequent diagnoses were schizophrenia disorders, followed by mood

disorders and personality disorders. Seventeen percent of the patients had more than one psychiatric diagnosis (Table 5).

In Study 2, we found that only 12% of the VA FEP patients had a comorbid SUD. However, comorbidity was much more frequent among the IA patients. By inclusion, all patients in Study 2 had FEP (89% schizophrenia and 11% mood disorders). Some of the patients might have had more than one psychiatric diagnosis, but those data were lacking. Alcohol, cannabis, and stimulants were the most frequently used substances among FEP patients.

In Study 3, the majority of the patients admitted to addiction treatment centers experienced comorbidity. More than two-thirds of the patients IA pursuant to the Social Services Act reported using three or more substances. Benzodiazepines, amphetamine, cannabis, and alcohol were the most commonly used substances in this group. The most frequent diagnoses among IA patients with SUD were neurotic disorders, attention-deficit hyperactivity disorders (ADHD), and mood disorders. More than one-fourth (26%) of these patients were diagnosed with multiple psychiatric diagnoses (Table 5).

The most frequent mental diagnoses among IA patients with SUD in all three studies are presented in Table 5.



Table 5. Per current ICD-10 psychiatric diagnoses of patients with SUD and involuntarily admitted to hospitals.

	Study 1	Study 2	Study 3
	SUD patients admitted to acute psychiatric wards	Patients diagnosed with first episode psychosis	Patients admitted to addiction treatment centers
	<i>n</i> =94	<i>n</i> =18	<i>n</i> =39
F20-F29 Schizophrenia disorders, %	42	89	8
F30-F39 Mood disorders, %	17	11	14
F40-F49 Neurotic disorders, %	6	-	28
F60-F69 Personality disorders, %	16	-	12
F90-F99 ADHD*, %	0	-	17
Multiple mental disorders, %	17	-	26
Other mental disorders, %	2	-	5

\*Attention-deficit hyperactivity disorders

In summary, a large proportion of the patients in all of the studies had comorbid psychiatric disorders and SUDs characterized by multiple drug use. Alcohol, cannabis, and stimulants were the most commonly used substances in all three studies. However, the types of psychiatric diagnoses were very different between the three patient populations (Table 5).

### 3.3 Aim 3

*Investigate factors associated with the involuntary admission of patients with SUD to hospitals.*

In all three studies, multiple logistic regression analysis was used to investigate possible differences between the IA and VA patients, controlling for relevant covariates. SUD influenced involuntary admission to hospitals in all three studies. In Study 1, being IA to acute psychiatric wards was significantly associated with the use

of stimulants (OR 2.3, 95% CI 1.266-4.099, P = 0.006). In Study 2, both SUD and non-SUD patients with FEP were included in the analysis. SUD was significantly associated with involuntary admission during follow-up (OR 5.2, 95% CI 1.654–16.498, P = 0.005). In Study 3, we found that patients IA to addiction treatment centers pursuant to the Social Services Act were characterized by more severe, long-term drug addiction than the VA patients. The IA patients were more often females, receiving public welfare benefits, and frequently visiting physicians for somatic complaints. Neither the severity of the mental illness nor the number of substance use diagnoses was associated with being IA.

In summary, in all three studies, we found that both VA and IA patients pursuant to either the Mental Health Care Act or the Social Services Act were typically males, relatively young, and living without a partner. A large proportion of the patients had comorbid psychiatric disorder and SUD characterized by multiple drug use. The presence of SUD influenced involuntary admissions to hospitals in all three studies.

## 4.0 Methodological considerations

The quality of the results of any epidemiological investigation is dependent on the methods used for sampling and measurement. Random error can be defined as the lack of precision due to high sampling variability (78). Selection bias (i.e., systematic error) is the difference between an observed value and the true value due to all causes other than sampling variability, such as selection and information measurement biases (79). For a study to be considered valid, the random and systematic errors should be minimal (78). Validity is divided into the concepts of internal and external validity. For descriptive studies, internal validity refers to the accuracy or quality of the study (i.e., how well the study was run in terms of research design and how variables were measured), and external validity is the extent to which the results can be generalized to larger populations and contexts outside the study sample (80, 81). The sources of these errors, the actions taken to reduce such errors, and the implications of the errors on our results and conclusions are discussed below.

Several methodological issues merit discussion in this thesis. The issue of involuntary treatment itself somewhat restricts the method choices. Ideally, the patients should be randomized into two different groups, with one group receiving involuntary treatment and the other group not receiving any treatment. Due to ethical considerations, randomization cannot be used when focusing on the involuntary treatment of patients with SUD. Studies comparing involuntarily treated patients with voluntarily treated patients contribute to our knowledge about differences in social characteristics, SUDs, comorbid mental disorders, and treatment outcomes, as well

as reasons leading to involuntary admission. In such studies, the type of control group and what kind of conclusion can be drawn should be carefully considered. In Studies 1 and 3, IA patients were compared with VA patients. We cannot rule out that this approach may have biased the results, but social characteristics were comparable in both groups and the VA patients had all been considered to qualify for treatment in a hospital. If a measure of "motivation for treatment" had been available for both IA and VA patients in the two studies, we could have adjusted for that potential confounding factor, but unfortunately such data were not available.

#### **4.1 Design**

Studies 1 and 3 both had a cross-sectional study design in which the collected information for both dependent and independent variables referred to the same point in time (82). Both studies compared VA and IA patients treated in hospitals. This design limits inference to causality, though measuring the strength of the association between independent and dependent variables is possible, but determining which one preceded the other is not (83). Study 2 had a longitudinal study design. We collected information both at inclusion and at the one and two-year follow-up.

#### **4.2 Selection bias**

Selection bias is a systematic error in a study that stems from the procedures used to select subjects and from factors that influence study participation (82). Some variations occurred between the three studies in the percentage of included patients.

In Study 1, the sample originally consisted of 38 acute psychiatric wards across all five health regions in Norway, which comprised 75% of Norwegian hospitals

providing acute inpatient treatment and results in a completeness of data considered to be representative of Norwegian acute psychiatric wards (5, 84). Patients were included over a 3-month inclusion period. This study did not require informed consent from the patients as only routine data were registered in the dataset. Almost all wards succeeded in including all patients admitted during the inclusion period. Approximately 95% of all patients admitted during the inclusion period are estimated to have been included in the material (56).

In Study 2, all FEP patients in a particular region during a specific time period were invited to participate in the study, and only 39 patients refused. No significant difference was found between those who refused to participate and those who were included in regards to age, gender, or duration of untreated psychosis. These are the core variables that indicate a lack of significant differences between the two groups. Limited data were available for the patients refusing to participate because the data were anonymized and the patients did not consent to a more comprehensive assessment.

In Study 3, the population was a specific SUD sample. The included patients were from three different publicly funded addiction treatment centers. The assessment was introduced to the wards as a routine tool. Therefore, all patients completed the same tests but chose whether these results could be included in the research project. This approach led to a high study participation rate. The rate of consent to participate was 84% among IA patients and 91% among VA patients. Information on the sociodemographic data for excluded patients was not available. Among the IA patients, 26 were not eligible and 12 refused to participate. These patients did not

differ according to age and gender. A total of 223 VA patients were identified, 72 of whom were not eligible because of too short of a stay in the treatment centers. The drop-out analysis showed that included and excluded VA patients did not differ according to age, but the proportion of women was somewhat higher among excluded patients than included patients (35% vs. 27%).

The reasons why VA patients did not complete the treatment may be complex. During the first days of treatment, some patients developed a need for another type of treatment and were transferred to different wards. Other patients experienced drug cravings and wanted to leave, whereas some had problems with family caring or conflict, or even caring for animals. Some patients just said that they were less motivated, and that this was not the right kind of treatment for them, so they would prefer to be treated somewhere else. Some patients said that they were now in control of their situation and able to manage on their own. However, the staff considered some of these patients as not having insight into their own SUD and accompanying ambivalence. A few patients exhibited threatening or violent behavior towards other patients or staff. For safety reasons these patients were asked to leave the ward.

In summary, our findings may indicate that the VA patients who did not participate differed from the included patients in that they had more severe symptoms. Therefore, the results of the VA patients may tend to underestimate the burden of pathology. Thus, the comparison with the IA group may be characterized by a tendency for greater differences between the groups than would have been the case if the non-responders among VA patients had been included.

Nevertheless, in all three studies, the non-participants were not indicated to differ in any major direction from the participants, and selection bias likely did not influence or substantially affect the main findings and conclusions.

### **4.3 Information bias**

Bias is the difference between the sampling value and the true population value. Systematic error can occur in a study because the information collected about or from the study subjects is erroneous (82). As the MAP study (Study 1) was a multicenter study, some methodological limitations need to be considered. Many staff members were involved in collecting the data, which could be a weakness because we do not know if they interpreted the questionnaires in the same way. The study did not include procedures to secure inter-site reliability, but written information about the study and education about using the instruments were given to all staff members. Another weakness could be that we did not have any data to decide whether some patients were admitted more than once during the inclusion period. However, the inclusion period was only 3 months, and the number of patients admitted more than once would be small; therefore, the issue of independent informants is expected to have little influence on the results.

In Study 2, we tried to avoid information bias using identical instruments with assessments performed by the same raters. All raters underwent an education program that included procedures to secure the inter-rater reliability in regards to both diagnosis and the description of symptom severity.

In Study 3, trained and certified staff members interviewed all patients. Standardized training was performed to ensure good quality data. Most patients expressed positive attitudes towards participation in the study, and even patients burdened by significant mental symptoms were able to regain control and become focused during the research interview. This ensured that even patients with the highest burden of morbidity were included in the study. The raters made comments if any conflicts or untrustworthy information were found in the collected information.

In all three studies, a risk of recall bias existed (82); the information that was obtained might have been affected by the patient's memory. The questions often concerned matters that happened a long time ago. In general, the patients did remember very well when they started using drugs, but it was more difficult for them to remember exactly when the drug use escalated. The description of substance use relied mostly on the patient interviews and recall, supplemented by collateral information; therefore, substance use may have tended to be under-reported in our studies. Despite the fact that the estimates of substance use may have been conservative estimates, we observed significant associations between substance use patterns and involuntary treatment in all three studies, indicating that the associations were relatively robust.

#### *4.3.1 Social desirability*

Social desirability may be an important form of information bias. The patient's response can be influenced by what he or she thinks is the correct answer and whether it was the patient's own therapist or someone outside the institution that conducted the interviews. Missing information and misclassification could both be problems if the patients were thinking that the information revealed during the interviews could entail any negative consequences. A SUD is more likely to be under-



reported than over-reported due to the social stigma associated with the conditions (85-87). Therefore, one bias could be that, by admitting current substance use, VA patients might fear losing their treatment options. However, the studies in this thesis focused on substance use patterns prior to admission to treatment and would not result in any consequences. Theoretically, patients could still report lower consumption rates than their actual consumption patterns. As such, our studies are likely based on minimum estimates.

Routine biomedical screening of specific alcohol and drug diagnostic tests can be used to increase the validity of information obtained regarding substance use patterns. Studies comparing urine analysis to routine clinical practice, such as structured interviews and patient self-reports, have demonstrated a general tendency for under-detection of recent substance use among patients admitted with acute psychiatric disorders if no biomedical screening is included (87, 88). In our studies, no biomedical screening was included.

#### *4.3.2 Reliability*

Reliability is the consistency of a measurement tool. The reliability of a scale indicates how free it is of random error. Two frequently used indicators of a scale's reliability are test-retest reliability and internal consistency. The test-retest reliability of a scale is assessed by administering it to the same persons on two different occasions and calculating the correlation between the two scores (89). Internal consistency is the degree to which the items that make up the scale all measure the same underlying attribute (89). In the three studies, we used several different measurement tools. The two main tools were the ASI and the Clinician Rating Scale,

which were used to assess the substance abuse found among alcohol- and drug-using patients included in the studies.

The ASI has been used widely during the past few years in drug and alcohol treatment settings. The reliability and validity of the ASI are well documented (90, 91). Studies have shown that the interobserver reliability of ASI composite scores is satisfactory when sufficient data are available (91, 92). However, Makelas' review of the literature questions the reliability found in some contexts (93). Furthermore, data quality control can be a neglected issue in some studies (89). However, all of the raters participating in the studies were trained and certified to perform the ASI interviews in order to improve reliability. A telephone number was available to call if the raters were uncertain of anything, and they were also offered a follow-up course in which problems could be discussed, though the lack of formal testing for reliability is a weakness.

The Clinician Rating Scale has been proven reliable, sensitive, and specific when used by case managers following clients over time (77, 94). The test-retest reliabilities for small samples over 1 to 2 weeks are close to 100%. Inter-rater reliabilities established by comparing the ratings of clinical case managers and team psychiatrists have yielded Kappa coefficients between 0.85 and 0.95 for SUDs (94). When Clinician Rating Scale ratings were compared to consensus diagnoses generated by a team of experienced psychiatrists using all of the clinical and research data available for each client to establish a current diagnosis of substance abuse or dependence, the Clinician Rating Scales achieved high sensitivity (94.7%) and specificity (100%) (77). In Study 2, all raters were trained by rating prepared case notes and audio/videotapes before entering the study assessment teams. The reliability of measurements ranged from poor to very good (Cronbach's alpha) (89)

[DUP, 0.99; GAF-S score, 0.68; GAF-F score, 0.45; drug abuse, 0.67; alcohol abuse, 0.81 (all intraclass correlations, 1.1); and for diagnostic categories  $K = 0.58$ ]. In Study 2, the GAF-F score was removed from further analysis due to poor reliability (95).

Nevertheless, the data in all of our studies were checked for errors and the frequencies of each of the variables inspected before analysis. In Study 3, three of the SCL-90-R questionnaires had a value outside the range of possible scores due to incorrect data entry in the data file. The errors were corrected.

#### *4.3.3 Confounding*

Confounding could simply be defined as confusion, or the mixing of effects; this implies that the effect of the exposure is combined with the effect of another variable, leading to bias (82). The two main strategies for handling confounding in research are to stratify analyses according to the potential confounding factor or to perform multivariate analysis. In these studies, we were investigating the relationship between involuntary admission and SUDs. Patients with SUD generally constitute a very heterogeneous group of patients, including patients with independent mental disorders complicated by substance use to patients with only psychoactive substance-induced disorders. In the present studies, multivariate analyses including known potential confounders were applied. However, “unknown” potential confounders may still bias the results (e.g., IQ, premorbid functioning, education), though we are not aware of any such factors that could have altered the presented results in any major way.

Neuropsychological functioning is one possible confounding factor that we were not able to control for. Patients in Studies 2 and 3 were offered such testing, but too many refused to participate. Therefore, the results were not included.

## **4.4 Strengths**

The three studies included in the thesis have several strengths. Standardized and/or established instruments were used in all studies, which allows the result to be compared to similar populations or other patient groups. The studies had a high inclusion rate, probably due to the data collection in most wards representing a standardization of initial examinations included in the wards' consecutive procedures. Study 1 was a large study including 75% of all acute wards in Norway; thus, informed consent was not necessary and we did not lose any patients due to refusal to participate. Study 2 had only a 15% drop-out rate during the 2-year follow-up period.

### *4.4.1 External validity*

External validity refers to the extent to which the results of a study can be generalized or extended to other studies (96). The process of generalization involves making assumptions about the domain in which the study results apply and is often a question of whether the studied factors distinguish the studied groups from other groups and somehow modify the results from the study (89). Before generalizing the findings reported in our studies, recognizing that differences might exist between the cohort of studied patients with SUD and the cohort of patients that was being treated (i.e., the target population) is important. The frequency of the involuntary hospitalization of patients varies between and even within different countries and is dependent on legislation, clinical experience, resources, traditions, and attitudes (34, 44).

The large data collection in Study 1 represents the diagnostic reality in a large number of clinical settings in Norway, not only in a strictly controlled experiment. The

sample is large compared to other international studies and may have the power to detect clinically significant associations. The findings can be generalized to SUD patients IA to hospitals according to the Mental Health Care Act in Norway, and probably even to other countries with similar laws.

Study 2 had a smaller sample size but was controlled for population variance via the selection of samples from the same healthcare sector within a short timeframe (1-year differences). No private institutions were present in the catchment area; therefore, we can assume that the obtained samples were very similar to an epidemiological sample in terms of the incidence of FEP. However, incidence was not the focus of Study 2. The included FEP patients were assumed to share similar characteristics, including substance use patterns, with FEP patients from other parts of Norway. Therefore, the presented findings can be generalized to other Norwegian populations of FEP patients.

A previous study from Norway showed that social services in different regions have different procedures regarding the use of involuntary admission pursuant to the Social Services Act (34). These differences can cause the threshold for admission to vary, and patients from different regions may present with different functional levels of physical health, psychological health, drug abuse, and social skills. In Study 3, the included patients were referred to the institutions from social service offices from Southern Norway pursuant to the Social Services Act, not from a specific region. A choice of hospital was not offered to this group of patients, so there was no selection to preferred institutions, and the included patients were considered to be a fair selection of patients from several regions. In addition, the total number of patients being IA according to this act in Norway is relatively low (33). Therefore, the relatively large sample size in Study 3 compared to all patients admitted based on this act

could likely be considered to be representative of patients IA according to the Social Services Act in Norway.

Overall, the associations presented in the three studies are considered relatively robust, as the overall impression from the studies was that no major known mechanisms of selection bias or confounding occurred, though it cannot be ruled out.

## 5.0 Discussion of results

The discussion is based on Aims 1 – 3. First, sociodemographic characteristics, including gender, age, marital status, and employment, are discussed. Thereafter, comorbid mental disorder and SUD is discussed. Finally, factors associated with involuntary admission are discussed.

### 5.1 Aim 1

#### *5.1.1 Gender distribution*

In psychiatric hospitals in Norway, a typical gender distribution of more women than men is found among inpatients (97). However, men are more often AI (56, 98). Overall, 64% of substance users IA to acute psychiatric wards pursuant to the Mental Health Care Act are males (99). In Norway, approximately 70% of persons with SUDs are men (97, 100). We found that 52% to 73% of the patients in our three studies were men (Table 4). Though the majority of substance users in Study 3 were males, we observed nearly twice as many females among the IA patients compared to the VA patients. Social workers have reported that the reason for the relative majority of female patients in involuntary addiction treatment might be that service providers consider women more vulnerable with exposure to violence and prostitution (34). The opposite sex distribution was reported by the Swedish National Board of Institutional Care; only one-third of the substance users in compulsory care pursuant to the Swedish Law on Care of Misusers were women (35).

### *5.1.2 Age*

The mean age of the patients in the three studies varied from 25 to 37 years (Table 4). The lowest mean age was found among IA patients with FEP (Study 2). This finding was expected because we examined a selected population of patients with their first episode of psychosis, which typically occurs in younger persons. Our findings in all the three studies are in accordance with Barnes et al., who found that patients with a reported lifetime history of substance use were significantly younger at the time of assessment, as well as at the onset of their psychotic symptoms (101).

### *5.1.3 Marital status*

One of the reasons why mental disorders cause adverse life course consequences is via impairment of a person's ability to form and maintain social relationships, including marriage. Marriage confers a variety of benefits (102). In Norway, couples also commonly live together without being formally married. In our studies, we found that the number of patients living with a partner was relatively low, varying from 9% to 18% (Table 4). This finding is in accordance with Breslau et al.'s study; across 19 countries (low-, medium-, and high-income countries), mental disorders were associated with a lower likelihood of marriage (102).

### *5.1.4 Employment*

The majority of the patients in all three studies were unemployed. The employment rates varied from 5% to 23% (Table 4). Notably, only 5% of the IA patients with FEP reported being employed.

Patients with serious mental illnesses and comorbid SUD are often excluded from vocational services, despite the lack of evidence that having a SUD necessarily



prevents them from being able to work (103). Frounfelker et al. found that, despite a similar interest in employment, clients with comorbid SUD were 52% less likely to enroll in a supported employment program than those without SUD. Patients who were enrolled had similar competitive employment rates: 25% for those with comorbid disorders and 28% for those without (103).

In summary, we found that both VA and IA patients, pursuant to either the Mental Health Care or the Social Services Act, were typically males, relatively young, unemployed and not living with a partner.

## **5.2 Aim 2**

Comorbid psychiatric disorders among patients with SUD are highly prevalent and have been linked to serious negative health consequences (104-110). In our studies, the proportion of SUD patients with comorbid mental health problems among the IA patients varied from 32% to 60%, and from 12% to 75% among the VA patients (Fig. 7). In Study 1, we found that approximately one-third of the patients (IA and VA patients) in acute psychiatric wards had comorbid SUD and mental health disorders. Overall, fewer FEP patients had a comorbid SUD (Study 2). However, the biggest difference between IA and VA patients was found among FEP patients, with comorbidity being much more frequent among those who were IA (Study 2). When examining patients admitted to addiction treatment centers (Study 3), we found that comorbidities were common in both groups. Other studies of the prevalence of SUD in psychiatric clients have also shown variations from one sample to the next (10, 64). The reason for this difference may be the methods used to assess SUD, the diagnostic criteria, the setting where the samples were obtained, and the

demographic characteristics of the samples. The particular demographics of the client population can also influence the estimated prevalence of SUD (12).

Examining patients with comorbid SUD and mental health disorders, we found that the most frequent substance use diagnosis among patients admitted to acute psychiatric wards and addiction treatment centers was F19, multiple drug diagnosis (ICD-10). Using more than one substance predicts a higher level of mental distress (111). Alcohol, cannabis, and stimulants were the most commonly used substances in all three of our studies. Other studies have reported that the most used drugs among schizophrenic patients are alcohol, cannabis, and cocaine. The schizophrenia/cannabis comorbidity has even been characterized as an epidemic (12, 112-114). Studies of emergency unit departments have reported cannabis as the drug most often associated with exacerbated schizophrenia and acute psychotic episodes (115, 116). The use of substances with psychotomimetic properties, such as cocaine, amphetamines, hallucinogens, and cannabis, can provoke psychotic reactions that resemble primary psychotic disease (117).

The findings in a review by Fiorentini et al. indicate that the propensity to develop psychosis seems to be a function of the severity of use and dependence (117). Distinguishing between primary and substance-induced psychoses is important. The symptoms of amphetamine-induced psychosis, as well as stimulant psychosis in general, will stop within 7–10 days of discontinuing the drug in nearly every case. However, some individuals with long-term or extensively use may continue experiencing intermittent psychotic episodes (e.g., hallucination, delusions, and/or paranoia) on an ongoing basis during the first year of abstinence (118).

Most commonly, stimulant-induced psychosis occurs in drug users who take large doses of a stimulant and may reflect acting-out behavior (119-121). These patients

may be agitated, aggressive, hallucinating, demonstrate suicidal behavior, and require extensive resources when admitted to a hospital (122, 123). One query made among Norwegian psychologists found that, when the patients were violent, the psychologists would admit and treat the patients involuntarily (61). This finding confirms our findings in Study 1 that stimulant use is associated with involuntary admission.

Several studies have shown that alcohol-dependent patients often have certain mood and anxiety disorders (124). The National Comorbidity Survey found that alcohol-dependent patients are two to three times more likely than non-dependent patients to have an anxiety disorder (125). The National Longitudinal Alcohol Epidemiologic Survey (NIAAA) found that patients with a history of alcohol dependence (even former drinkers) have a more than four-fold increased risk of a major depressive episode compared to patients without a history of alcohol dependence (126). Alcohol seems to have a calming effect on anxiety in the short term, but a reinforcing effect in the long term (127). In Study 1, 26% of the IA patients and 40% of the VA patients were found to qualify for an alcohol diagnosis (F10) combined with mood disorders (F30). In Study 3, the mood disorder diagnoses were frequently found among both IA and VA patients. In addition, approximately one-third of IA and VA patients were diagnosed with a neurotic disorder (F40). In fact, neurotic disorder was the diagnostic group most frequently utilized in Study 3. In Study 1, 42% of the IA patients were diagnosed with schizophrenia disorders. Mueser et al. reported that 53% of all IA psychiatric patients (SUD and non-SUD patients) suffered from schizophrenia or schizoaffective disorders, and that alcohol was the most commonly abused substance (12).

However, other larger studies of the prevalence of specific types of substance abuse in clients with a variety of severe mental illnesses have failed to show whether patients diagnosed with certain psychiatric disorders are more prone to using particular types of substances (128, 129). The evidence suggests that the availability of different types of substances, rather than their subjective effects, is the primary determinant of which specific substance is used (130).

In summary, we found that a large proportion of patients had comorbid psychiatric disorder and SUD characterized by the use of multiple drugs. The most frequent substance use diagnosis was F19, multiple drug diagnosis (ICD-10). Alcohol, cannabis, and stimulants were the most commonly used substances in all three of our studies.

### **5.3 Aim 3**

In all our three studies, SUD had an influence on involuntary admission to hospitals. In Study 1, being IA to acute psychiatric wards was significantly associated with the use of stimulants (OR 2.3, 95% CI 1.266-4.099,  $P = 0.006$ ). In addition to drug-induced psychosis, stimulants also often resulted in an acting-out behavior; these patients may be agitated, aggressive, hallucinating, demonstrate suicidal behavior, and require extensive resources when admitted to the hospital (122, 123). The aggressive behavior, rather than the severity of the psychiatric disorder, may determine if admission to the hospital is voluntary or involuntary. Thus, one might question whether the Mental Health Care Act is used to protect society from non-psychotic but aggressive patients intoxicated by stimulants. In fact, the findings in Study 3 indicate that the Social Services Act functions according to its purpose to

care for severely addicted patients with comorbid disorders who were in need of treatment. However, one can question whether the Social Service Act is applied according to its intention given the low number of patients IA pursuant to this law (see Fig. 2) compared to the much greater number of patients with comorbid SUD who were admitted pursuant to the Mental Health Care Act in Norway (Fig. 3).

In Study 2, both SUD and non-SUD patients with FEP were included in the analysis. The presence of a SUD was significantly associated with involuntary hospitalization during follow-up (OR 5.2, 95% CI 1.654–16.498,  $P = 0.005$ ). Power et al. found that most patients in the initial acute phase of FEP were admitted to hospital (131). Wade et al. concluded that SUDs are significantly associated with inpatient admission during follow-up; 76% of substance-abusing patients were hospitalized during the first 3 months of treatment (132). In our study, 77 patients (75%) received voluntary treatment, and 26 patients (25%) received involuntary treatment at baseline. In a study by Opjordsmoen et al. that included inpatients only, 58% of the patients were treated voluntarily (133). If we exclude outpatients from our analysis, our findings were in accordance with their findings; 59% (61 patients) were voluntarily admitted. We also found that 60% (15 patients with SUD) had been IA during the first year, and the number increased to 18 patients (72%) in the second year. Involuntary admission to the hospital was approved for 26% of non-SUD patients during the first year; by year 2, 31% of non-SUD patients had undergone at least one involuntary admission. The difference between the involuntary admission rates of the two groups increased during the 2-year observation period. Thus, we found that comorbidity with SUD was significantly related to involuntary admission and readmission.

In Study 3, patients IA to addiction treatment centers pursuant to the Social Services Act were characterized by severe, long-term drug addiction. These patients were more often females, receiving public welfare benefits, and visiting physicians for somatic complaints. Other studies have also found that a pattern of severe substance use increases the risk of somatic disorders, including chronic disease, acute disease, and injuries (134, 135). Neither the severity of the mental illness nor the number of SUD diagnoses was associated with being IA. Kallert et al. and Priebe et al. found that patients have significant, but limited, improvements in their symptoms after involuntary treatment, possibly reflecting the severity of the underlying illness (136, 137). Social factors, but not the psychiatric diagnosis, were important predictors of outcomes.

The patients with SUD studied in these projects illuminate characteristics among a vulnerable group of patients that often exhibit comorbid SUD and mental health problems, but they may also exhibit somatic disorders. These patients are often sent back and forth between different treatment institutions (138). Landheim et al. found that 41% of patients in addiction treatment centers had been previously treated in mental health care (63). These patients had more severe mental disorders than patients who had only been treated in addiction treatment care.

Both nationally and internationally, a divided support system for addiction treatment and mental health care is a major challenge for patients who have comorbid SUD and mental disorders. Despite the large differences in health care and social services between the U.S. and European countries, structural problems in interactions between addiction treatment services and mental health care sectors are a common feature (139). Landheim found that 70% of the patients in addiction treatment fulfill the requirements for mental health care (63). Thus, one could ask whether the

addiction treatment centers have the knowledge and skills needed to assess and treat these patients with severe mental disorders. Similarly, we can question whether mental health institutions have the required skills to adequately detect and treat SUD. Policymakers are faced with this ambivalence as they struggle with the extent to which SUD patients should be subjected to involuntary treatment (140).

Similarly, patient reactions to experiences in compulsory care can be mixed. One Swedish study found that approximately half of patients report feelings of anger and violation, one-third are passive, and one-fifth are positive (50). In a study of 104 patients with alcohol use disorders, 87% of the involuntarily treated and 52% of the voluntarily treated reported at the discharge interview that they felt that the coercive experiences were wrong or violated their personal integrity (141).

In summary, in Studies 1 and 2 we found that SUD influenced involuntary admission to hospitals. Being IA to acute psychiatric wards was significantly associated with the use of stimulants. FEP patients with SUD also had a significantly higher risk of being IA to a hospital during the 2-year follow-up (OR 5.2). In Study 3, all patients were SUD patients and demographic characteristics, such as female gender, being on public welfare benefits, having more frequent visits to physicians for somatic complaints, injecting illicit drug abuse, and severe long-term drug addiction, were all associated with involuntary admission to addiction treatment centers pursuant to the Social Services Act.

## 6.0 Clinical implications

Our findings do have some important implications for clinical practice. Simultaneous integrated treatment is recommended for both SUD and mental disease (12, 142). To provide adequate care, treatment centers caring for these and similar patients would likely benefit from expertise in both SUD and psychiatric disorders, as well as somatic disorders. These patients often have poor treatment outcomes, including problems with relapse, suicide, vulnerability to trauma, and re-hospitalization (144), and this must be taken into account when organizing treatment.

Kessler et al. found that primary mental disorders strongly predict later SUD (145). Many patients with comorbid diagnoses report that mental disorders occurred at an early age, before their first SUD. This finding raises the question of whether early, successful treatment of primary mental disorders is effective in reducing subsequent SUDs.

Finding conclusive evidence of how to use involuntary admission and treatment both for the benefit of the patient and to inform policy makers, health service providers, and the public is important (146). In psychological treatment, the therapeutic relationship is considered to be a necessary factor to achieve improvement (147, 148).

A good therapeutic relationship is usually based on the patient's motivation and cooperation in treatment, and on voluntariness and mutual trust between the therapist and patient. However, mental health care with involuntary admission of patients who do not consent to treatment is not necessarily the premise of volunteerism and cooperation. Patients may have been persuaded, pressured, or



forced into treatment, and they often have very negative attitudes towards treatment. The degree of perceived coercion is likely to affect the interaction between patient and therapist. Focusing on the therapeutic relationship may reduce the patient's degree of perceived coercion and may contribute to increased satisfaction with inpatient mental health care, regardless of the legal status of the admission (48, 149).

## 7.0 Future research

As indicated in this dissertation, a need exists for more research in the field; long-term follow-up in particular is still lacking. Knowledge about SUD patients who are IA to a hospital is lacking for both the Mental Health Care Act and the Social Services Act. The research base needs to be broadened to better understand the mechanisms of comorbidity, which may enable us to more effectively prevent the occurrence of comorbidities and more effectively treat patients with comorbid disorders (150).

First, a need exists to evaluate the impact of the use of involuntary admission and long-term treatment outcomes for this patient group.

Second, an extensive need still exists for in-depth studies describing the patient's experiences with the admission process and inpatient period. These patients experience many difficult situations that can be very stressful and humiliating. The degree of perceived coercion is likely to affect the interaction between patient and therapist. Focusing on the therapeutic relationship may reduce the patient's degree of perceived coercion and contribute to increased satisfaction with inpatient mental health care, regardless of the legal status of the admission.

Thus, studying interventions that can increase respect for the patient's needs and reduce the feeling of violation is important. Interventions should also include an assessment of the treatment alliance and, preferably, staff should be trained explicitly to both maintain and re-instate the alliance when a rupture is evident. Studying different ways to strengthen patient participation in the decision-making process during treatment is also important.

Practitioners have long expressed concern about the impact of a patient's motivation on treatment outcomes. A lack of motivation is a common phenomenon in treatment, and the patient's motivation is a critical factor determining treatment outcome. To determine if involuntary treatment is as useful as intended, investigating more about the patient group and treatment delivery is crucially important, as well as investigating whether the treatment manages to improve the motivation of IA patients. In addition to involuntary treatment, other formal and informal social pressures are placed on these patients that have to be considered. Informal coercion refers to the pressures the patients experience from sources other than the justice system, such as by an employer or family (151). Voluntarily treated individuals may also experience these types of pressures. Important control factors are the coercion perceived by the patient and the severity of problem, such as alcohol, drug, and psychiatric severity, which will influence motivation (152) and should be included in future studies.

## 8.0 Conclusion

The main objective of this thesis was to explore the relationship between substance use patterns and involuntary admission to hospitals in different settings pursuant to the Mental Health Care and Social Services Acts. We found that a large proportion of the IA patients had comorbid SUD and psychiatric disorder. This comorbidity likely renders treatment more difficult. Patients diagnosed with comorbidities often require longer treatment duration and more carefully planned care to optimize treatment outcomes. This need presents a major challenge to the health service providers, indicating the need to diagnose and treat these patients within a highly competent system. Therefore, clinical routines that better identify and treat SUD among patients receiving mental health care should be given higher priority, as many of the patients would likely benefit from integrated specialist treatment. Study 3 also found that 60% of patients IA pursuant to the Social Services Act had mental disorders. These patients also required competent mental health treatment by a specialist. The study also found that the patients needed treatment for somatic health problems. Therefore, health providers must be educated to meet all of these different needs.

Relatively little difference was found in the sociodemographic variables between patients IA pursuant to the Mental Health Care Act and those admitted pursuant to the Social Services Act. Given the relative low number of SUD patients IA to hospitals pursuant to the Social Services Act and the high proportion of SUD patients IA pursuant to the Mental Health Care Act, one can question if the laws are applied according to their intention and if patients with SUD are treated in the right system. Therefore, focusing on a more correct and consistent use of involuntary admissions and treatment within the right system is important.

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**Papers I-III**









# Substance abuse in patients admitted voluntarily and involuntarily to acute psychiatric wards: a national cross-sectional study

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## ABSTRACT

**Background:** Substance abuse and mental disorder comorbidity is high among patients admitted to acute psychiatric wards. The aim of the study was to identify this co-occurrence as a reason for involuntary admission and if specific substance use-related diagnoses were associated with such admissions.

**Methods:** The study was a part of a multicentre, cross-sectional national study carried out during 2005-2006 within a research network of acute mental health services. Seventy-five percent of Norwegian hospitals providing acute in-patient treatment participated. Substance use was measured using the Clinician Rating Scale and the ICD-10 diagnoses F10-19. Diagnostic assessments were performed by the clinicians during hospital stay.

**Results:** Overall, 33.2% (n=1,187) of the total patient population (3,506) were abusing alcohol or drugs prior to admission according to the Clinician Rating Scale. No difference in the overall prevalence of substance abuse-related diagnoses between the two groups was found. Overall, 310 (26%) of the admissions, 216 voluntarily and 94 involuntarily admitted patients received a double diagnosis. Frequent comorbid combinations among voluntarily admitted patients were; a combination of alcohol and either mood disorder (40%) or multiple mental disorders (29%). Among involuntarily admitted patients, a combination of poly drug use and schizophrenia was most frequent (47%). Substance abusing patients diagnosed with mental and behavioral disorders due to the use of psychoactive stimulant substances had a significantly higher risk of involuntary hospitalization (OR 2.3).

**Conclusion:** Nearly one third of substance abusing patients are involuntarily admitted to mental hospitals, in particular stimulant drug use was associated with involuntary admissions.

## INTRODUCTION

The prevalence of substance abuse (SA) among patients admitted to acute psychiatric wards varies according to setting and mode of measurement. Prevalence of such comorbidities among inpatients with severe mental illness ranges from 24.4% to 70.0% in reports from single wards [1-6]. Comorbid SA typically complicates recovery from mental health disorders and is associated with increased use of health services [7,8].

Involuntary admission and treatment of mentally ill patients are controversial issues in mental health care worldwide [9]. The frequency of involuntary hospitalizations varies between and even within different countries, and is dependent on legislation, clinical experience, resources, traditions, and attitudes [4,5,10-13]. According to the Norwegian Mental Health Care Act [14], compulsory psychiatric mental health care may take place when the patient is suffering from a suspected or established serious mental disorder to prevent severe deterioration of the patient's health status or in

cases where there is an obvious threat to the patient's own life or the life of others.

Involuntary admission rates to psychiatric hospitals in Norway are high compared to other European countries [12]. Published involuntary referral rates for 1998-2000 from other Nordic and European countries range between 6 (in Portugal) and 218 (in Finland) per 100,000 inhabitants/year [10,15,16]. In Norway, the respective incidence rates for civil commitment based on "involuntary referrals", "treatment periods", and number of persons involved were 259, 209, and 186 per 100,000 adults/year according to a study conducted by Iversen et al. [12]. Based on the frequent application of coercive mental health care and the context of high rates of comorbid SA and mental illness in Norway [1,2,4], it is important to further investigate the role of substance abuse among patients admitted to acute psychiatric services. Previous studies have focused either on involuntary admissions and treatment in mental hospitals [4,5] or on substance abuse among mentally ill patients [1,2]. However, we have not been able to

find studies that have examined comorbidity and involuntary admissions to hospitals. One of the aims of this study was to investigate if there were specific substance-related diagnoses associated with involuntary admissions.

In order to provide better treatment it is necessary to explore the extent to which the patient's behavior, i.e. drug use prior to admission, predicts the application of coercion in psychiatric wards.

### *Aims of the study*

1. To investigate if substance abusing patients had a higher risk of involuntary admission to acute psychiatric wards.
2. To investigate whether there could be typical patterns of diagnostic comorbidity of substance abuse and mental disorders among patients abusing psychoactive substances prior to admission to acute psychiatric wards.
3. To investigate if there could be specific substance-related diagnoses associated with involuntary admissions.

## **MATERIALS AND METHODS**

### *Setting*

In Norway the application of coercive mental health care for the mentally ill patients is covered by the Mental Health Care Act [14]. The most common causes for involuntary hospital admission in mental health care are schizophrenia, paranoid psychoses, and acute reactive psychoses [4]. Another act, the Social Services Act §6.2, covers an option for involuntary admission to the hospital for three months for persons without severe mental illness, but who are primarily addicted to psychoactive substances and whose substance abuse may cause risk to their physical or mental health [17]. In 2009 in Norway, a total of 87 decisions were made for substance abusing persons for involuntary admissions to institutions according to the Social Services Act [18], whereas more than 7,200 patients were admitted involuntarily based on the Psychiatric Healthcare Act [19]. Many of these were patients with substance abuse problems typically treated in psychiatric hospitals, rather than in drug treatment facilities [17].

In 2004 the national health authorities reorganized the funding of alcohol and drug abuse treatment and the responsibility for provision of care was transferred from the counties to the Specialist Healthcare Authorities. Currently, Social Services, together with the Psychiatric Specialist Healthcare Services and the Specialist Substance Abuse Services, share joint responsibility for SA patients. Nevertheless, these services often operate independently with limited interaction. Thus, the group of vulnerable substance abuse patients often experience problems when admitted to the Specialist Substance Abuse Services leaving them suffering from lack of treatment addressing their specific needs [18].

### *Study subjects*

This study was part of the cross-sectional Multicentre-study of Acute Psychiatry (MAP) in Norway. The data collection was carried out as a national cross-sectional study during 2005 and 2006 within a research network of acute mental health services. Data on patient characteristics and treatment episodes were collected from all patients admitted during a three-month period. The network was organized and coordinated by the research institute SINTEF Health Research in Norway with support from the Norwegian Directorate of Health and Social Affairs [20,21].

The sample originally consisted of 39 wards, which were categorized into three groups: 4 admission wards, 28 acute wards, and 6 subacute wards. One ward was an intermediate term ward and was removed from the sample, resulting in a total of 38 acute wards. This comprised 75% of Norwegian hospitals providing acute inpatient treatment. The clinics were located in both urban and rural parts of the country and were assumed to cover a representative sample of the Norwegian population [20]. Data from 3,506 admissions to adult acute psychiatric wards were collected. Very few patients may have had more than one admission in the 3-month inclusion period. Thirty-five percent of patients were involuntarily admitted to the hospital [22].

### *Instrument and measures*

Drug and alcohol use during the six months prior to index hospital admission was assessed by the Clinician Rating Scale [23,24], which measures the consumption of psychoactive substances on a scale from 1 to 5. The ratings are 1 = no use, 2 = use without impairment, 3 = abuse, 4 = dependence, and 5 = dependence with need for institutionalization. The use of psychoactive substances without impairment is defined as "no evidence of persistent or recurrent problems in social functioning, legal status, role functioning, mental status, or physical status, and no evidence of recurrent dangerous use". The patients were subsequently divided into two groups:

1. The non-substance abuse group including patients who scored 1 or 2 on the Clinician Rating Scale (for alcohol and/or drugs).
2. The substance abuse group including patients who scored 3, 4, or 5 on the Clinician Rating Scale (for alcohol and/or drugs).

Demographic, administrative, and clinical information, in addition to one primary and up to two secondary ICD-10 diagnoses [25], were recorded for each patient. Diagnoses were based on "routine clinical assessments", and on structured clinical interviews that measured SA over different time periods. The Clinician Rating Scale measured alcohol and drug use, respectively, during the six months prior to admission, whereas ICD-10, F10-19 diagnoses represent current substance use disorders as judged by the clinician during the hospital stay. The focus of this study was on

**Table 1.** Patient demographics and premorbid functioning of voluntarily and involuntarily hospitalized patients with substance abuse according to Clinician Rating Scale.

	Voluntary admission	Involuntary admission	P-value
N=1187 (%)	826 (70)	361 (30)	
Mean age (SD)	36.7 (12)	34.4 (11.9)	0.002
Male (%)	63	64	0.705
Living with partner (%)	18	15	0.140
<b>Housing</b>			
Rented or owned (%)	68	57	<0.001
Homeless or hospice (%)	11	11	0.931
Employed (%)	10.2	8.6	0.459
Education beyond primary school (%)	44	38	0.028
Mean number of days since last discharge (SD)	110 (149)	91 (147)	0.105
GAF symptoms at admission (mean/SD)*	39.2 (11.3)	30.7 (11.8)	<0.000
GAF social at admission (mean/SD)*	38.9 (9.8)	33.6 (10.5)	<0.000
<b>Suicide risk at admission</b>			
Suicidal ideation or plans (%)	60.1	27.7	<0.000
No suicidal self-injurious behaviors (%)	9.0	5.5	0.058
Attempted suicide (%)	4.1	6.4	0.129
No suicide risk (%)	24.8	50.7	<0.000
Suspect intoxicated on admission** (%)	48	57	0.006
Positive alcohol test on admission (%)	13	9	0.059
Positive drug test on admission (%)	12	20	0.001
Police assisted admittance (%)	18	62	<0.001

\* Global Assessment of Social Functioning, scale from 0 to 100 with lower ratings for more severe problems

\*\* As judged by clinicians

patients who reported drug use with impact/abuse pattern before admission to acute psychiatric wards. We were therefore notably interested in patients scoring 3 or higher on the Clinician Rating Scale; these patients formed the study sample and the basis for further analysis. Patients were tested for substance use by laboratory drug tests upon hospital admission.

The Global Assessment of Functioning Scale (GAF) was used to rate social, occupational, and psychological functioning. The latter scores were split into symptom scores (GAFs) and function scores (GAFf) [26]. No reliability tests were carried out. All clinicians had experience in rating GAF as a routine measure required in the mental health services.

#### Analysis and statistical methods

Continuous data are presented as means with standard deviations (SD) and analyzed using Student's *t*-test when normal distributed. Multiple logistic regression analysis was performed to investigate whether specific substance-related diagnoses predicted involuntary admission (dependent variable). Results are presented with 95% confidence intervals. Continuous variables were checked for correlation with Spearman's rho; none of the included continuous variables had a correlation >0.7. Significance level was set at  $P < 0.05$ . Analyses were performed using SPSS 16.0 software (SPSS Inc., Chicago, IL, USA).

#### Ethics and informed consent

The Regional Committee for Medical and Health Research Ethics and the Data Inspectorate, Oslo, Norway

(REK: 211-04049 NSD: 11074) approved the study. The Norwegian Directorate of Health and Social Affairs provided permission to collect information from health services. The Regional Committee for Medical and Health Research Ethics approved that data was collected without asking for consent, as it was considered ethically important also to include those that were involuntarily admitted and would be most likely to not give consent.

## RESULTS

According to the Clinician Rating Scale, 1,187 of the 3,506 admissions (33.2% of all admissions) were patients abusing psychoactive substances prior to admission. We found that 826 (70%) of the admissions were voluntarily admitted SA patients and 361 (30%) were involuntarily admitted SA patients (Table 1).

Two-thirds of both voluntarily and involuntarily admitted SA patients were males, mean age 36 years and 34 years, respectively. Involuntarily admitted patients had more severe problems as measured by GAFs and GAFf scores. Significantly more voluntarily admitted patients than involuntarily admitted patients had suicidal ideation or plans (Table 1). Sixty-two percent of involuntary admissions and 18% of the voluntary admissions required police assistance. Suspected intoxication rates at admission were higher among involuntarily admitted patients, in particular positive drug tests were found in up to one-fifth of those patients.

At discharge, 290 (35%) of the voluntarily and 131 (36%) of the involuntarily admitted SA patients were

**Table 2.** Diagnosis according to ICD-10 of voluntarily and involuntarily hospitalized patients.

	Total	Voluntary admission (%)	Involuntary admission (%)	P-value
<b>Diagnosis (primary)</b>				
F 10-19 Substance use disorders	421 (35.5)	290 (35.1)	131 (36.3)	0.696
F 20-29 Schizophrenia disorders	201 (18.7)	88 (11.8)	113 (34.5)	<0.001
F 30-39 Mood disorders	232 (21.6)	187 (25.1)	45 (13.7)	<0.001
F 40-49 Neurotic disorder	94 (8.8)	84 (11.3)	10 (3.0)	<0.001
F 60-69 Personality disorders	89 (8.3)	65 (8.7)	24 (7.3)	0.462
<b>Substance use diagnosis</b>				
(F10.) Alcohol	197 (16.6)	153 (18.5)	44 (12.2)	0.007
(F11.) Opioids	20 (1.7)	13 (1.6)	7 (1.9)	0.653
(F12.) Cannabinoids	22 (1.9)	14 (1.7)	8 (2.2)	0.540
(F13.) Sedatives or hypnotics	22 (1.9)	17 (2.1)	5 (1.4)	0.429
(F14.) Cocaine	1 (0.1)	1 (0.1)	0 (0)	0.508
(F15.) Other stimulants	49 (4.1)	24 (2.9)	25 (6.9)	0.001
(F16.) Hallucinogens	0 (0)	0 (0)	0 (0)	
(F18.) Volatile solvents	1 (0.1)	1 (0.1)	0 (0)	0.508
(F19.) Poly drug	324 (27.3)	213 (25.8)	111 (30.7)	0.078
No substance diagnosis	551 (46.4)	390 (47.2)	161 (44.6)	0.442
<b>Total</b>	<b>1187 (100)</b>	<b>826 (100)</b>	<b>361 (100)</b>	

**Table 3.** Patterns of comorbid mental disorders and substance abuse disorders; ICD-10 diagnosis.

	Admission	F10 Alcohol (%)	F15 Stimulant (%)	F19 Poly drug (%)	Other* (%)	Total (%)
F20-F29 Schizophrenia disorders	Voluntary	6 (8)	5 (39)	26 (28)	2 (6)	39 (18)
	Involuntary	6 (22)	2 (40)	22 (47)	9 (60)	39 (42)
F30-F39 Mood disorders	Voluntary	30 (40)	2 (15)	23 (25)	15 (43)	70 (32)
	Involuntary	7 (26)	1 (20)	4 (9)	4 (27)	17 (18)
F40-F48 Neurotic disorders	Voluntary	12 (16)	0	8 (9)	4 (11)	24 (11)
	Involuntary	2 (7)	0	4 (9)	0	6 (6)
F60-F69 Personality disorders	Voluntary	1 (1)	2 (15)	16 (17)	6 (17)	25 (12)
	Involuntary	3 (11)	1 (20)	10 (21)	1 (7)	16 (17)
Multiple mental disorders	Voluntary	22 (29)	2 (15)	13 (14)	8 (23)	45 (21)
	Involuntary	8 (30)	1 (20)	6 (13)	1 (7)	16 (17)
Other mental disorders	Voluntary	4 (5)	2 (15)	7 (8)	0	13 (6)
	Involuntary	1 (4)	0	1 (2)	0	2 (2)
Total	Voluntary	75 (100)	13 (100)	93 (100)	35 (100)	216 (100)
	Involuntary	27 (100)	5 (100)	47 (100)	15 (100)	94 (100)

\* Use of one of: F11. opioids, F12. cannabinoids, F13. sedatives, F16. hallucinogens

given a primary substance abuse diagnosis according to ICD-10 F10-F19 (Table 2). Of the primary mental diagnoses, mood disorders (F30-39) and neurotic disorders (F40-49) were significantly more frequently diagnosed among patients admitted voluntarily. Schizophrenia spectrum disorders (F20-29) were significantly more common among the involuntarily admitted patients. Although no difference in the overall prevalence of substance abuse-related diagnoses between the two groups was found, there were differences in the specific patterns of drug abuse. Among voluntarily admitted patients, alcohol-related diagnoses were significantly more common, whereas stimulant drugs were significantly more common among involuntarily admitted patients. A tendency towards more polydrug

use was observed in patients admitted involuntarily.

Overall, 310 of the SA admissions (216 voluntary and 94 involuntary admissions) received a double diagnosis (Table 3). Some typical comorbid patterns of drug use and mental disorders were found. Alcohol use or poly drug use were most frequent. Among the voluntarily admitted patients, a combination of alcohol and either mood disorder (40%), multiple mental disorders (29%), or neurotic disorder (16%) were more frequent. Among involuntarily admitted patients, a combination of poly drug use and schizophrenia was most frequent (47%).

Multiple logistic regression analysis was used to investigate whether being involuntarily hospitalized in acute psychiatric wards was associated with any spe-

**Table 4.** Drug diagnosis (ICD-10) patterns and associations with involuntary hospitalization in acute psychiatric wards. Bivariate and multivariate analyses.

Characteristics	Bivariate analysis unadjusted OR (95% CI)	P-value	Multivariate analysis adjusted OR (95% CI)	P-value
Male gender	0.943 (0.729-1.221)	0.657	0.939 (0.722-1.223)	0.642
Age	0.984 (0.973-0.994)	0.002	0.989 (0.977-1.000)	0.046
Substance use Diagnosis				
No abuse diagnosis	reference			
Alcohol	0.700 (0.478-1.026)	0.068	0.751 (0.507-1.111)	0.152
Stimulant	2.536 (1.407-4.573)	0.002	2.278 (1.266-4.099)	0.006
Multiple drugs	1.269 (0.946-1.702)	0.112	1.181 (0.873-1.598)	0.281
Other	1.107 (0.632-1.937)	0.722	1.062 (0.607-1.859)	0.833

cific drug use patterns. The use of stimulants was significantly associated with involuntary admission (OR 2.3, 95% CI 1.266-4.099,  $P=0.006$ ) (Table 4).

## DISCUSSION

One-third (33.2%) of the total hospital admissions ( $n=3,506$ ) were patients abusing psychoactive substances prior to admission to acute psychiatric wards according to the Clinician Rating Scale. Of these, 70% were voluntarily admitted and 30% involuntarily admitted. No difference in the overall prevalence of substance abuse-related diagnoses between the two groups was found. Among voluntarily admitted SA patients, alcohol-related diagnoses were significantly more common. A tendency towards more polydrug use was observed in patients admitted involuntarily. SA patients diagnosed with mental disorders due to stimulant use had a significantly higher risk for involuntary hospitalization (OR 2.3).

### Prevalence and characteristics

Using the Clinician Rating Scale revealed a prevalence of substance abuse among patients admitted to acute psychiatric wards of 33.2%, which is concordant with similar previous studies. In these studies using the same Clinical Rating Scale as a screening tool on smaller and more selected populations, the reported prevalence varies between 24% and 69% [8,27-29]. Studies reporting prevalence of substance use based on self-report tended to underestimate the prevalence compared with studies based on laboratory or on-site drug analyses [30].

Involuntarily admitted patients tested positive significantly more often for substances on drug tests performed at hospital admission. They were more often suspected to be intoxicated. Police assisted admissions were more frequently required (Table 1). However, it is noteworthy that as many as 18% of the voluntary admissions also required police assistance. Several studies suggest that the patients' experience of being coerced during the admission process to mental hospitals do not necessarily correspond with their legal status [31, 32]. Rather, perceived coercion appears to be associated

with a feeling that their views were not taken into consideration in the admission process. In a study by Iversen et al. 32% of voluntarily admitted patients perceived high levels of coercion in respective of legal status at admission.

### Diagnoses and diagnostic comorbidity

Different modes of substance use detection often result in different prevalence estimates. Applying the Clinicians Rating Scale revealed more substance abusers than that diagnosed by clinicians according to ICD-10 coding. According to the Clinicians Rating Scale, 1,187 of the admissions were patients abusing psychoactive substances. However, only 53% of these received a substance abuse diagnosis according to ICD-10.

Some typical patterns of diagnostic comorbidity of SA and mental disorders among patients abusing psychoactive substances prior to admission were found. Alcohol and polydrug use were the two most frequently observed patterns. Among patients admitted voluntarily, a combination of alcohol and either mood disorders, multiple mental disorders, or neurotic disorders were common, whereas a combination of polydrug use and schizophrenia was most frequent among involuntarily admitted patients. This is in agreement with the study of Mueser et al. who reported that 53% of all the involuntarily hospitalized psychiatric patients (SA and non-SA patients) suffered from schizophrenia or schizoaffective disorders, and alcohol was the most commonly abused substance [24].

SA patients diagnosed with mental and behavioral disorders due to psychoactive stimulant use had a significant higher risk for involuntary hospitalization (OR 2.3). This could be due to stimulant-induced psychosis or it may reflect acting-out behavior among stimulant-using patients. Most commonly, stimulant psychosis occurs in drug abusers who take large stimulant doses [33-35]. In nearly every case, the symptoms of amphetamine-induced psychosis (as well as stimulant psychosis in general) will stop within 7-10 days of discontinuing the drug. However, some individuals with long-term or "heavy" use may continue experiencing intermittent psychotic episodes (hallucination, delusions, and/or paranoia) on an ongoing basis during the

first year of abstinence [36]. It is clinically challenging to differentiate between a drug-induced psychosis and other forms of psychosis during the initial phase.

Stimulants seem to predict involuntary admission in our study. Besides stimulant-induced psychosis, stimulants also often produce an acting-out behaviour and these patients may be agitated, aggressive, hallucinating, demonstrate suicidal behaviour, and require extensive resources when admitted to the hospital [37, 38]. The aggressive behavior rather than the degree of severity of the psychiatric disorder could determinate if admission to hospital becomes voluntary or involuntary. It is of concern if the Mental Health Act designed to provide health care for psychotic patients is regularly used towards non-psychotic but aggressive patients intoxicated by stimulant drugs.

There are some methodological considerations to recognize when interpreting results from this study. First, the cross-sectional study design can only provide associations, not causation. Second, the diagnoses used in this study are clinical diagnoses and not necessarily based on any standardized, structured interviews. Nevertheless, this study has a relatively large sample size, is nationally representative, and may have the power to

detect important associations of clinical significance. The large data collection represents the diagnostic reality in a large number of clinical settings in Norway, and not only in a strictly controlled experiment.

This study indicates that more than half (53%) of patients abusing substances prior to admission to acute psychiatric wards, addiction treatment alone or in combination with treatment for mental disorders may be more appropriate than mental disorder treatment alone. This and other studies have shown that SA and mental disorders are co-occurring and comorbidity renders treatment more difficult, leading to greater use of health services [8,39]. Therefore, clinical routines to better identify SA among patients receiving mental healthcare should be given higher priority in order to provide optimal treatment, as many of the patients likely would benefit from additional treatment in specialist substance abuse services.

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# Predictors of involuntary admissions among non- psychotic patients with substance use disorders and comorbidity: a cross-sectional study

Running title: Substance use disorders and involuntary admissions

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## **Abstract**

**Background:** To investigate factors associated with involuntary admissions to hospital pursuant to the Social Services Act of patients with substance use disorder by comparing the socio-demographic characteristics, substance use, and psychiatric comorbidities with voluntarily admitted patients.

**Methods:** This cross-sectional study compared two groups admitted to combined substance use disorder and psychiatry wards. Sixty-five patients were involuntarily admitted pursuant to the Social Services Act and 137 were voluntarily admitted. The International Classification of Diseases and Related Health Problems was used for diagnostic purposes regarding substance use disorders, type and severity of psychiatric problems, and level of functioning. Socio-demographic variables were measured using the European Addiction Severity Index, and the Symptom Checklist-90-R instruments were used to evaluate the range of psychological problems and psychopathological symptoms. Logistic regression was performed to investigate the relationship between involuntary admissions and patients characteristics.

**Results:** Patients who had been involuntarily admitted were more often females, had utilized public welfare services more often, more severe substance use patterns, and more frequent visits to physicians for somatic complaints in the past 6 months, but had fewer comorbid mental disorders. Still, considerable burdens of comorbid substance use disorders and mental disorders were observed both among involuntary and voluntary admitted patients.

**Conclusions:** To meet the needs of these patients with complex and mixed disorders, treatment centers should offer diagnostic skills and therapy regarding substance use disorders, psychiatric disorders, and somatic disorders.

**Keywords:** Substance use disorder; comorbidity; involuntary admission, mental disorders

## **Introduction**

Substance dependence is a chronic relapsing disease that typically leads to psychiatric, somatic, and social comorbidities, often with shortened life expectancy [1]. In contrast to other patients with chronic diseases, patients with substance use disorders (SUDs) sometimes refuse treatment owing to denial of their own disorder, feelings of hopelessness, or a negative attitude toward treatment [2, 3]. In many countries, the involuntary admission of SUD patients to institutions has been a controversial option when voluntary care has proven unsuccessful [4]. As of 2001, 73 of 90 countries worldwide provided some form of compulsory commitment (acute or rehabilitative) motivated by the intent to protect an otherwise legally capable individual who is in a self-destructive and vulnerable situation because of substance use [5]. In the literature, three main legislative domains have been described as foundations for the mandated treatment of SUD patients: mental health care acts or social services acts (in combination called civil commitment), and criminal justice acts. Although most countries may apply one or more of these acts to SUD patients, not all countries provide all three alternatives [4]. Literature from the United States has been dominated by drug courts' studies of treatment as an alternative to prison [6]. Psychiatric research often reports on involuntary versus voluntary treatment. Less focus has been paid to SUD patients in treatment pursuant to the mental health care acts, although a considerable proportion of these patients are SUD patients [7, 8].

The Norwegian Mental Health Care Act (§§ 3.2 and 3.3) is designed for patients based on their need for psychiatric care. Involuntary commitment is an option only for persons who are found by a medical professional or psychologist to be incapable of assessing their own need for care. Such incapacity is only stated when patients are severely mentally ill (psychotic) and may be a danger to themselves or others [9]. In 2010, there were approximately 8300

involuntary admissions to mental health care units in Norwegian hospitals pursuant to this law [10]. Approximately one-third of patients involuntarily admitted to mental health care hospitals had a substance use disorder [11].

The Norwegian Social Services Act (§ 6.2) warrants involuntary interventions for non-psychotic adult patients with SUDs. The act covers an option for retention (up to three months) when the health of the patient is seriously at risk because of extensive and prolonged substance use, and voluntary efforts have shown to be insufficient. In Norway, voluntary and involuntarily admitted SUD patients are often treated within the same wards, and using the same kind of therapy. In the acute phase, the main target of retention is to provide life-saving treatment; in the longer term, the aim is to motivate patients to enter voluntary treatment [12]. During 2010, only 106 decisions were made for the involuntary admission of SUD patients to institutions pursuant to the Social Services Act [13].

Involuntary commitment of non-psychotic SUD patients, although a relatively marginal phenomenon, is controversial. Such interference with personal autonomy should not be applied without an evidence-based foundation [14]. In Sweden, the phenomenon of SUD patients in compulsory care pursuant to social services acts has to some extent been explored [15]. However the acts in these two countries differ considerably and Swedish results may not be directly applicable to Norwegian settings. Thus far, little is known regarding the characteristics of involuntarily admitted patients in Norway and the factors associated with these admissions. This study addresses this knowledge gap and focuses on SUD patients who have been involuntarily admitted to institutions pursuant to the Social Services Act §6.2.



## Aims of the study

The aims of the study were to describe the socio-demographic characteristics, substance use patterns, and psychiatric comorbidities among SUD-patients involuntarily admitted to hospital pursuant to the Social Services Act by comparing them with voluntarily admitted patients. In addition factors associated with involuntarily admission to treatment institutions were investigated.

## **Materials and methods**

### Study subjects

This cross-sectional study compared two groups: involuntarily and voluntarily admitted patients admitted to combined substance use disorder and psychiatry wards. Involuntarily admitted (IA) patients were included from three different publicly funded treatment centers in the southeastern part of Norway. The centers were located in Kristiansand, Tønsberg, and Oslo, and had 4, 4, and 3 beds for IA patients, respectively. All of the voluntarily admitted (VA) patients were from the same ward of the Kristiansand center as the IA patients. All wards were multidisciplinary (psychiatrists, psychologists, social workers, occupational therapists, specialized nurses, and other trained staff) and had specialized units that offered treatment for patients with primary SUD often combined with mental disorders (except psychosis). Treatment included assessments of somatic and mental health, with diagnoses based on a structured interview and examination in accordance with the International Classification of Diseases and Related Health Problems, 10th Revision (ICD-10); pharmacotherapy; cognitive milieu therapy; and individual motivation enhancement. The patient population was recruited mainly from urban and suburban areas.

Recruitment for the study continued consecutively from January 1, 2009 to May 31, 2011. The criteria for inclusion were as follows: substance abuse or dependence, age  $\geq 18$  years, understanding/speaking the Norwegian language, and at least 3 weeks of treatment (so that abstinent patients could be interviewed).

Before inclusion, both the IA group and the VA group of patients were detoxified, verified by either negative urine tests of alcohol, opioids, central stimulants (amphetamines, methamphetamines, and cocaine), benzodiazepines, and cannabis, or a minimum of 14 days spent in detoxification. Patients with mental retardation ( $IQ < 70$ ) who were not able to understand the questionnaires were excluded. Because pregnant SUD patients are treated in special wards, they were not included in this study.

Altogether, 103 consecutive IA patients were identified. Fifteen did not meet the inclusion criteria (12 because their stay was too short, and 3 because of insufficient mental capacity), 11 were not asked to participate owing to logistical issues. Of the 77 patients eligible for inclusion 12 refused to participate. Therefore, the rate of consent to participate was 84% (65 patients). There were 223 VA patients identified; 72 patients were excluded (69 because their stay was too short, 3 because of insufficient mental capacity). Of the remaining 151 VA patients, 14 refused to participate. Therefore, rate of consent in the VA group was 91% (137 patients).

The study was approved by The National Committee for Research Ethics in Norway (REK 08/206d, 2008/2900, 09/2413) and by the Privacy Issues Unit, Norwegian Social Science Data Services (NSD no. 18782). Written informed consent was obtained from all study participants.

## Instruments and measures

The ICD-10 was used for diagnostic purposes regarding current substance abuse, current type and severity of psychiatric problems, and level of functioning [16]. All patients were subjected to a clinical psychiatric examination supported by the Mini-International Neuropsychiatric Interview (MINI) version 2005. The MINI is a short psychiatric interview for the assessment of psychiatric disorders in accordance with the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition (DSM-IV) and ICD-10 classification systems [17], and has high acceptance and validity [18, 19]. The interviews were conducted by senior psychiatrists and psychologists who had many years of clinical and research experience with the psychiatric assessment of patients with physical disorders. In the statistical analysis, psychiatric diagnoses were categorized as serious mental illness (F 20-39, which includes schizophrenia and mood disorders) or other mental illnesses (F 40-99) [20]. Injecting illicit drugs during the past 6 months before admission and lifetime prevalence of overdoses were used as indicators for severe substance abuse.

Socio-demographic variables were measured using the European Addiction Severity Index (EuropASI); a personal, structured interview designed for both clinical and research purposes. It includes 7 areas: medical status, employment and support status, drug and alcohol use, legal status, family history, family and social relationships, and psychiatric status [21]. The EuropASI interviews were performed by trained and certified staff. Specific substance use patterns based on the EuropASI were dichotomized into drug consumption at least once weekly versus less than weekly. The Symptom Checklist-90-R (SCL-90-R) instrument was used to evaluate the range of psychological problems and symptoms of psychopathology. The SCL-90-R test contains 90 items, measures 9 primary symptom dimensions, and provides an overview of a patient's symptoms and their intensity. Each of the 90 items is rated on a five-point Likert-type scale, ranging from “not at all” (0) to “extremely” (4): higher values indicate

greater symptom severity during the past week. The Global Symptom Index (GSI) score was used to assess the level of general psychological distress [22].

### Analysis and statistical methods

Continuous variables are reported with means and standard deviations. Categorical variables are reported as frequencies. The independent sample *t*-test, Chi-squared test, and Fisher's exact test were used to test for statistically significant differences between groups. Logistic regression was performed to investigate the relationship between involuntary admissions and patient characteristics. Results are presented with 95% confidence intervals. Continuous variables were checked for correlation with Spearman's rho. None of the included continuous variables had a correlation exceeding 0.7. The number of cases in the sample restricted the predictors included in the model. From univariate analysis, variables with a *P*-value < 0.10 were included in the multivariate analyses except "overdoses on drugs" because of multicollinearity with the variable "injecting illicit drugs". The threshold for statistical significance was *P* < 0.05. Analyses were performed using SPSS 18.0 Software (SPSS Inc., Chicago, IL, USA).

## Results

### Patient characteristics

We found several differences between the IA and the VA groups (Table 1). There were significantly more female patients among the IA patients compared with the VA patients (48% vs. 27%; *P* = 0.004). During the 6 months prior to admission, significantly more IA patients received financial support from public welfare benefits, and were more often injecting illicit drugs. In addition, IA patients had experienced more overdoses during their

lifetime compare with VA patients. IA patients had also significantly more frequent visits to physicians for somatic complaints during the 6 months prior to admission. However, the burden of psychological symptoms (SCL-90-R and suicide attempts) was higher in the VA group.

#### Mental health diagnoses and substance use disorders

All patients met the ICD-10 criteria for current substance dependence or abuse. IA patients were using alcohol, benzodiazepines and other sedatives, and heroin significantly more often than VA patients (Table 2). Significantly more IA patients received “no mental diagnoses”, but among those with comorbid mental disorders, no significant differences were observed between the two groups regarding mental health diagnosis. The most common mental diagnoses among both IA and VA patients were F40-49 neurotic disorders, F 90 attention-deficit hyperactivity disorder (AD/HD), and F30-39 mood disorders. Among the personality disorders (F 60), emotionally unstable personality disorder (F 60.3) was the most common in both groups (8% of IA patients and 7% of VA patients) (Table 3).

Multiple logistic regression analysis was used to investigate whether being involuntarily admitted to an institution was associated with any specific patterns. Female gender, receiving public welfare benefits, and more frequent visits to physicians for somatic complaints or injection of drugs during 6 months prior to treatment were all associated with involuntarily admission pursuant to the Social Services Act (Table 4). Neither the severity of the mental illness nor the number of substance use diagnoses were associated with being involuntarily admitted.

## **Discussion**

Overall, SUD patients in the IA group were characterized by severe drug dependence (defined as injection of drugs and high prevalence of overdoses), often combined with the need for public welfare benefits and a history of more frequent visits to physicians for somatic complaints. Comorbid substance use disorders and mental disorders were observed among the majority of patients in both groups, although the burden of psychological symptoms (SCL-90-R and suicide attempts) was somewhat higher in the VA group.

### Characteristics of involuntarily admitted patients

The substance users included in this study were relatively young, with a mean age of 29 years for IA patients. This is somewhat younger than what was reported by a national study of substance abusers involuntarily admitted to acute psychiatric wards pursuant to the Mental Health Care Act (mean age, 34 years) [11].

In Norway, approximately 70% of persons with SUDs are men [23]. In accordance with this statistic, we observed that, overall, 66% of patients were men. Although the majority of substance users were male, we observed nearly twice as many females among the IA patients compared with the VA patients. Social workers have reported that the reason for the relative excess of female patients in involuntary treatment might be that the service providers considered women more vulnerable and exposed to violence and prostitution [24]. The opposite sex distribution was reported by the Swedish National Board of Institutional Care: only one-third of the substance users in compulsory care pursuant to the social services act were women [25]. Psychiatric hospitals in Norway are characterized by the typical sex distribution, with more women than men among inpatients; however, men are more often

involuntarily admitted [8, 26]. Overall, 64% of substance users involuntarily admitted to acute psychiatric wards pursuant to the Mental Health Care Act were male [27].

#### Severity of drug dependence

IA patients exhibited more severe drug use patterns than VA patients. Significantly more IA than VA patients had been injecting illicit drugs during the last 6 months before admission (71% vs. 46%). Injection of drugs implies both the strongest involvement with drug use and the highest risk of substance-related morbidity and mortality. Among IA patients, 70% also reported a history of lifetime overdose experiences. According to an overview by Bohnert et al., the lifetime prevalence of overdoses among drug users ranges between 43% and 74% [28]. Hence, the studied population of SUD patients appears to exhibit a particularly high-risk drug use profile.

Polydrug diagnoses tend to be more common among IA patients ( $P= 0.05$ ). According to the EuropASI interviews, IA patients exhibited a consistently higher prevalence of drug use: alcohol, benzodiazepines, other sedatives, and heroin were consumed significantly more often. These findings are similar to those reported in Swedish studies which observed that IA patients were more often drug users and polydrug users, while VA patients more often abused alcohol [15]. The high prevalence of polydrug use is a current trend reported in other studies of psychiatric disorders among SUD patients [11, 15].

#### Mental diagnoses and comorbidity

Psychiatric comorbidity has previously been identified among patients admitted involuntarily pursuant to the Mental Health Care Act [10, 11, 26], including the patients admitted pursuant to the Social Services Act in this study. Although there were no significant differences between the types of mental diagnoses, significantly more IA patients had no mental

diagnoses (40% vs. 26%). In an overview of several studies from Sweden, it was observed that 50% to 60% of patients seeking help for substance use disorders did have another psychiatric disorder [15]. Other studies have found that among patients seeking help for psychiatric disorders, between 24% and 70% also had a substance abuse problem [29-33]. It has also been shown that comorbidity contributes to re-admission for substance use disorder patients, as well as for those with mental disorders [26, 34].

IA patients had also significantly more frequent visits to physicians for somatic complaints during the past 6 months (42% of IA patients, compared with 25% of VA patients). This finding indicates that a pattern of severe substance use also increases the risk of somatic disorders. High prevalence of chronic disease, acute disease, and injuries among SUD patients have also been demonstrated by others [35, 36]. The SUD patients studied in this project illuminate characteristics among a vulnerable group of patients that often exhibit combined SUD and mental health problems, but also exhibit somatic disorders in addition. Therefore, comorbidities appear to be particularly relevant. To provide adequate care, treatment centers caring for the needs of these and similar patients would likely benefit from expertise in substance use disorders, psychiatric disorders, and somatic disorders.

There are some methodological considerations to recognize when interpreting these results. First, the comparison of the two groups, IA patients and VA patients, may be somewhat problematic: VA patients may generally be expected to be more motivated for treatment and more cooperative than IA patients. However, the groups' characteristics regarding age, education, living conditions, and mental health status were similar. The VA patients had all been considered to qualify for treatment in a hospital. Second, to establish accurate diagnosis for patients with concurrent substance abuse, mental, and somatic disorders can be a challenge. There will always be a risk of misdiagnosing, underreporting, or overreporting



illnesses. Furthermore, it is difficult to make comparisons between studies and countries owing to differences in laws and diagnostic procedures [37].

This study addresses the knowledge gap and focuses on SUD patients who have been involuntarily admitted to institutions pursuant to the Social Services Act §6.2. Our findings of which factors that are associated with involuntary admissions to hospital of these patients may provide useful knowledge that clinical practitioners and authorities would benefit from. We found that, rather than ICD-10 diagnoses, demographic characteristics and severity of drug use (injecting drugs, overdoses) were associated with involuntary admission to a treatment institution in this study. Female gender, receiving public welfare benefits, frequent visits to physicians for somatic complaints, and drug injection during the past 6 months were all associated with involuntarily admission pursuant to the Social Services Act.

In sum, the factors associated with involuntary admission presented in this study indicate that “poverty”, somatic complaints, and a perception of females who use injection substances as “victims of addiction” characterize patients involuntarily admitted to treatment for substance use disorders in Norway. Patients diagnosed with comorbidity will often require a longer time in treatment and more carefully planned care to optimize treatment outcomes. The concurrence of SUD, mental, and somatic complaints presents a major challenge to health service providers, indicating the need to diagnose and treat these patients within a highly competent system.

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### **Competing interests**

The authors declare that they have no competing interests.

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Table 1.

Baseline socio-demographic variables and mental stress scores for substance abuse patients voluntarily or involuntarily admitted to addiction treatment centers

	Involuntary <i>n</i> / Voluntary <i>n</i>	Involuntary	Voluntary	<i>P</i> - value
Age, mean (SD)	65/137	29 (10.6)	31 (8.9)	0.229
Female (%)	65/137	31 (47.7)	37 (27)	0.004
<u>Education</u>				
Mean years in primary and high school (SD)	59/130	10.53 (1.4)	10.59 (1.6)	0.783
Mean years in college/university (SD)	59/130	0.17 (0.8)	0.31 (1.0)	0.352
<u>Sources of financial support<sup>a, c</sup></u>				
Employment (%)	60/130	6 (10.0)	24 (18.5)	0.137
Unemployment compensation (%)	60/130	2 (3.3)	4 (3.1)	1.000
Public welfare benefits (%)	62/135	59 (95.2)	115 (85.2)	0.043
Mate, family, or friends (%)	60/130	17 (28.3)	37 (28.5)	0.985
Illegal activity (%)	60/130	24 (40.0)	47 (36.2)	0.610
Prostitution (%)	60/130	3 (5.0)	1 (0.8)	0.094
<u>Usual living arrangement<sup>c</sup></u>				
With partner (%)	60/130	8 (13.3)	11 (8.5)	0.298
Alone (%)	60/130	31 (51.7)	62 (47.7)	0.610
With family (%)	60/130	9 (15.0)	26 (20.0)	0.409
No stable arrangement (%)	60/130	9 (15.0)	16 (12.3)	0.610
Controlled environment (%)	60/130	2 (3.3)	15 (11.5)	0.065
Visits to physician for somatic complaints <sup>c</sup> (%)	60/130	24 (40.0)	32 (24.6)	0.031
Injecting illicit drug <sup>c</sup> (%)	61/134	43 (70.5)	62 (46.3)	0.002
Alcohol delirium tremens <sup>d</sup> (%)	59/130	9 (15.3)	15 (11.5)	0.477
Drug overdoses <sup>d</sup> (%)	59/130	41 (69.5)	63 (48.5)	0.007
Suicide attempts <sup>d</sup> (%)	60/131	23 (38.3)	71 (54.2)	0.042
<u>Mental stress score</u>				
SCL-90-R GSI <sup>b</sup> , mean (SD)	62/135	1.04 (0.7)	1.28 (0.7)	0.023

<sup>a</sup>Some have more than one source of financial support

<sup>b</sup>SCL-90-R GSI, Symptom Check List-90-revised, Global Symptom Index

<sup>c</sup>Last 6 months before admission, <sup>d</sup>Lifetime prevalence

Table 2.

Substance abuse with respect to ICD-10 diagnosis and Addiction Severity Index of patients voluntarily and involuntarily admitted to addiction treatment centers

	Involuntary <i>n</i> / Voluntary <i>n</i>	Involuntary (%)	Voluntary (%)	<i>P</i> -value
<u>F10-19 Substance abuse disorders</u>				
Single substance	65/137	9 (13.8)	32 (23.4)	0.116
Two substances	65/137	11 (16.9)	30 (21.9)	0.412
Three or more substances	65/137	45 (69.2)	75 (54.7)	0.050
<u>Substance Abuse<sup>ab</sup></u>				
Alcohol	60/132	29 (48.3)	41 (31.1)	0.021
Heroin	61/134	21 (34.4)	18 (13.4)	0.001
Other opiates	60/130	11 (18.3)	25 (19.2)	0.883
Benzodiazepines, other sedatives	60/134	39 (65.0)	63 (47.0)	0.020
Amphetamines	62/135	35 (56.5)	67 (49.6)	0.374
Cannabis	61/133	32 (52.5)	71 (53.4)	0.905
Cocaine, inhalants, hallucinogens	60/132	12 (20.0)	18 (13.6)	0.260

<sup>a</sup>Some patients abuse more than one substance, <sup>b</sup>Last 6 months before admission

Table 3.

Current ICD-10 diagnoses of patients voluntarily and involuntarily admitted to addiction treatment centers

Diagnosis	Involuntary (%)	Voluntary (%)	<i>P-value</i>
<u>Mental diagnosis</u>			
No mental diagnosis	26 (40.0)	35 (25.5)	0.037
Severe mental diagnoses (F20-F39)	14 (21.5)	38 (27.7)	0.347
Other mental diagnoses (F40-F99)	25 (38.5)	64 (46.7)	0.270
<u>F 20-90 Mental disorders<sup>a</sup></u>			
(F 20.) Schizophrenia disorders	5 (7.7)	5 (3.6)	0.297
(F 30.) Mood disorders	9 (13.8)	33 (24.1)	0.094
(F 40.) Neurotic disorders	18 (27.7)	48 (35.0)	0.298
(F 50.) Behavioral syndromes	1 (1.5)	4 (2.9)	1.000
(F 60.) Personality disorders	8 (12.3)	22 (16.1)	0.484
(F 70.) Mental retardation	1 (1.5)	0	
(F 80.) Developmental disorders	1 (1.5)	0	
(F 90.) Attention-deficit hyperactivity disorders	11 (16.9)	35 (25.5)	0.172
<i>N</i> =	65	137	

<sup>a</sup>Some patients have more than one mental diagnosis



Table 4.

Logistic regression analysis of the effect of involuntary admission to addiction treatment centers pursuant to the Norwegian Social Services Act on independent variables

Characteristics	Bivariate analysis OR <sup>a</sup> (95% CI)	<i>P</i> - value	Multivariate analysis OR <sup>b</sup> (95% CI)	<i>P</i> - value
Sex (female)	2.464 (1.331-4.561)	0.004	2.424 (1.174-5.003)	0.017
Public welfare benefits	3.420 (0.977-11.979)	0.054	4.029 (1.022-15.877)	0.046
Visits to physician for somatic complaints <sup>c</sup>	2.042 (1.063-3.921)	0.032	2.208 (1.032-4.725)	0.041
<u>Substance abuse diagnosis</u>				
Single substance	reference		reference	
Two substances	1.304 (0.474-3.587)	0.608	0.626 (0.184-2.129)	0.454
Three or more substances	2.133 (0.933-4.876)	0.072	1.034 (0.381-2.809)	0.947
Injection drug abuse in the last 6 months	2.774 (1.453-5.296)	0.002	2.925 (1.338-6.392)	0.007
<u>Mental diagnosis</u>				
No mental diagnosis	reference		reference	
Severe mental diagnoses (F20-F39)	0.496 (0.224-1.099)	0.084	0.532 (0.196-1.443)	0.215
Other mental diagnoses (F40-F99)	0.526 (0.265-1.045)	0.066	0.679 (0.293-1.547)	0.367
Suicide attempts (lifetime)	0.525 (0.282-0.980)	0.043	0.519 (0.244-1.105)	0.089
Scl-90-R GSI	0.581 (0.363-0.929)	0.023	0.693 (0.401-1.199)	0.190

<sup>a</sup>unadjusted OR, <sup>b</sup>adjusted OR, <sup>c</sup>Last 6 months before admission

