

Trond Nordfjærn

**Patients with Substance
Use Disorders**
**An investigation of Relapse,
Substance Use and Recovery**

Thesis for the degree of Philosophiae Doctor

Trondheim, June 2011

Norwegian University of Science and Technology
Faculty of Social Sciences and Technology Management
Department of Psychology



NTNU – Trondheim
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Preface and Acknowledgements

The present thesis was written as a part of the research project ‘A Study of Psychosocial Correlates of Substance Use and Relapse among Patients with Substance Addiction’. The research project was funded by the Drug and Alcohol Treatment in Central Norway in the period 2007 to 2011. In this context ‘Central Norway’ refers to the counties of Sør-Trøndelag, Nord-Trøndelag and Møre-Romsdal. The core aim of the present thesis was to investigate psychosocial and contextual factors associated with relapse and substance use among patients with substance addiction. An additional aim was to examine how these patients perceived such factors in relation to their treatment and recovery. This was investigated by a multicentre study conducted in 16 Norwegian treatment facilities for substance use disorders.

The thesis consists of four research papers. These papers have been published in international scholarly journals with peer review. The results have also been presented at several local, regional, national and international research conferences. In addition, the thesis comprises an introductory summary section that places the four papers into a larger theoretical framework. Some information is repeated because the same data materials underlie the different parts of the thesis.

There are several people who have directly and indirectly contributed to the work with this thesis. My supervisor Professor Dr. Torbjørn Rundmo is one of the more creative and productive researchers in Scandinavian psychology. Professor Rundmo has not only contributed substantially to the work with the present thesis, but also involved me in other projects related to societal challenges and risky behaviours. I am grateful for his valuable input in discussions and critical readings and his excellent advice throughout this project’s process. His research experience, expertise and ability to motivate students are admired by many. I also appreciate the way he involved me in international research events and the supervision of students.

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I would also like to thank my colleagues at the Drug and Alcohol Competence Centre in Central Norway, the R&D Department in the Drug and Alcohol

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During the project, Kyrre Svarva lent me his helpful and pedagogical approach to psychometrics and statistics for which I am grateful. I appreciate senior psychologist at the Bergen Clinics, Erik Iversen, for his generosity in sharing the population data. These data were used to compare the representativity of the current sample for the relevant patient population. I also express my gratitude to everyone who proofread preliminary versions of the research papers and the introductory theoretical framework. My dear family and friends deserve gratitude for their patience and support during the work with the thesis. I am indebted to the patients who participated in the survey investigations and semi-structured interviews. Without their willingness to participate and share information it would have been impossible to complete the project. The research coordinators at the treatment facilities were both kind and professional in their patience and persistence with the data collection.

Trond Nordfjærn

Trondheim, January 2011.

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List of Papers

The thesis is based on the empirical papers listed below.

Paper I:

Nordfjærn, T. (2010). Relapse patterns among patients with substance use disorders. *Journal of Substance Use* (accepted for publication).

Paper II:

Nordfjærn, T., Hole, R., & Rundmo, T. (2010). Interrelations between patients' personal life events, psychosocial distress and substance use. *Substance Use & Misuse*, 45, 1161-1179.

Paper III:

Nordfjærn, T. (2010). Do severity levels of substance use relate to self-reported variations in psychosocial distress? *Journal of Substance Use* (accepted for publication).

Paper IV:

Nordfjærn, T., Rundmo, T., & Hole, R. (2010). Treatment and recovery as perceived by patients with substance addiction. *Journal of Psychiatric and Mental Health Nursing*, 17, 46-64.

Summary [en]

The main purpose of the present thesis was to investigate contextual and psychosocial factors with potential importance for relapse, substance use and perceptions of treatment and recovery processes among patients with substance addiction. The thesis is based on two different data materials. Studies I, II and III are based on a cross-sectional survey investigation carried out among a patient sample (N = 352) recruited from 16 treatment facilities for substance use disorders in Norway. Study IV is based on material established by semi-structured interviews of 13 patients recruited from six clinics in the central region of Norway. The included treatment facilities covered the majority of common specialised treatment approaches for substance use disorders in Norway. Most of the treatment facilities carried out psychosocial treatment for poly-substance use, and included short-term inpatient treatment lasting up to six months, long-term inpatient treatment exceeding six months, as well as open-ended outpatient treatment and Opioid Maintenance Treatment (OMT). The clinics have a broad approach to substance use disorders; they include interventions based on, for instance, cognitive therapy, motivational interviewing, family therapy, milieu therapy, methadone or buprenorphine maintenance and interventions in a therapeutic community. Several clinics also offered opportunities for physical activity and advice regarding economic issues and accommodation. Some clinics also collaborated with public services in the municipalities to establish work-related activities for their patients.

The theoretical framework for the studies was stress models for substance use (i.e. the self-medication hypothesis and the life stress model). These models assert that substance use could be caused by psychological symptoms and social problems (i.e. psychosocial factors). The self-medication hypothesis argues that substance addiction is caused by a need to relieve psychological distress induced by psychological disorders. According to the life stress model of substance use, the probability of such use is regulated by the levels of stress experienced by the individuals and the presence of potential moderators such as social networks, social competence and resources. The behavioural choice theory for substance use was also relevant for the work in the present thesis. This theory argues that substance use and relapse could be interpreted as an overall lack of alternative rewarding activities to substance use. The behavioural choice theory asserts that substance use could be reduced or avoided by establishing competing activities to substance use such as occupational activities and education. Therefore, the studies also focused on contextual variables with potential importance for the everyday functioning of the individuals. Such variables could, for example, be occupational activities and social and material resources that the patients have at their disposal. Demographic

characteristics, such as gender and age, were also considered relevant in this line of enquiry. However, it should be noted that the thesis did not specifically aim to validate these comprehensive theories and models. These theories and models constituted the theoretical basis and established the rationale for the empirical work. The thesis considers substance use disorders in a broad community psychological perspective. It was expected that the results would have implications both for clinical practice, aftercare strategies and preventive interventions.

Study I examined the time interval from treatment discharge to potential relapses among the patients. Contextual and psychosocial factors related to a prolonged or reduced time interval after treatment to a relapse were also explored. The findings suggested that the relapse risk was very high during the first months after treatment. The results also showed that adolescents had higher probabilities of early relapses compared to older patients. Patients who experienced an early relapse after treatment were more likely to be unemployed and to use opioids or alcohol as their main substances. Patients who had been enrolled in several different treatment programmes that used various approaches had higher likelihood of early relapse compared to patients who had only been enrolled in one type of treatment programme. Inpatient treatment of long and short durability increased the time period from treatment discharge to relapse. Aftercare and treatment follow-up strategies should focus on the period of time of the early months after treatment discharge. An adequate countermeasure would be to facilitate work-related and educational activities for the patients before they have completed treatment. Focus on risk perception regarding substance use among adolescents could reduce the relapse risk among this specific demographic risk group. Clinicians could facilitate internal motivation for treatment among these patients. The higher relapse risk of adolescents also underlines the importance of early intervention for this group.

Study II tested a hypothesised model where significant life events, interpersonal problems, psychological distress and self-efficacy predicted substance use. Differences in these associations according to gender were also examined. The results showed that both negative and positive life events had stronger relations to substance use behaviours among males. Psychological distress was strongly linked to substance use among both genders, but this relation was somewhat stronger among females. Interpersonal problems were associated with psychological distress, but a direct relation to substance use was not supported by the empirical data. The findings could justify the use of different clinical approaches when male and female patients are exposed to life stress. Male patients could benefit from learning adaptive behavioural coping strategies when they are confronted with major negative life events, whereas females could benefit from

establishing or seeking out supportive social networks. The strong association between psychological distress and substance use implies that an increase in psychological competence of personnel in specialised treatment for substance use disorders could be beneficial.

The aim of study III was to examine whether patients with high or low consumption levels of illicit substances or alcohol differed on specific dimensions of psychosocial symptom load operationalised by the Symptom Checklist-90-Revised (SCL-90-R) and Inventory of Interpersonal Problems – Circumplex (IIP-C). The findings showed that the prevalence of psychosocial symptom load was higher in the groups with high consumption levels of illicit substances or alcohol. Further, the results showed that these differences were stronger for those who manifested high consumption levels of illicit substances compared to those who mainly had high consumption levels of alcohol. Very few patients had a high consumption level of both alcohol and illicit substances; the reason could be that patients who have high consumption levels of illicit substances are subjected to more discrediting attitudes and attributes than patients who mainly manifest severe alcohol consumption. This partly stems from the legal status of alcohol and the fact that alcohol is often consumed in acceptable contexts by the general public (e.g. restaurant and pubs). There is also the fact that patients with high alcohol consumption had more available resources than patients who mainly used illicit substances to consider. Differences in psychosocial distress related to levels of alcohol consumption were stronger for anxiety disorders, whereas variations concerning illicit substances related to several heterogeneous psychosocial symptoms. This could indicate that the sedative effects of alcohol serve important functions for patients with anxiety disorders. Patients who use illicit substances may be more sensitive to a high variety of negative emotional symptoms. There were few differences related to interpersonal problems between the consumption groups. This underlines that the relation between interpersonal problems and substance use could be of an indirect character.

Study IV investigated contextual and psychosocial variables with potential relevance for how patients perceived processes related to treatment and recovery. Despite the fact that paper IV is located towards the end of the thesis, study IV was the first study conducted in the PhD project. Since this study indicated that contextual and psychosocial factors, such as therapeutic relations, social support and material resources, were important for patients' perceived recovery, the subsequent studies mainly focused on contextual and psychosocial variables in conjunction with relapse and substance use. Specifically, the results in paper IV showed that the patients focused on recovery in different domains related to

psychological health, substance use, social functioning and the initiation of occupational activities. They also focused on the establishment of proper housing and economic improvements. The patients stressed the importance of therapeutic relationships and mutual support among patients in the clinics when they were asked about how they perceived processes related to treatment. They focused on the positive influences of trustful and respectful attitudes of the treatment personnel. According to the patients, treatment based in trust and respect between the caregivers and patients was important for the initiation of recovery processes. Both positive and negative influences of patient interactions were focused on by the patients. Patients reported that other patients at the clinics had convinced them to remain in the programmes when they were tempted to prematurely drop out or relapse to substance use. However, according to the patients who did not receive methadone or buprenorphine as part of their treatment, those who did receive methadone or buprenorphine had less motivation regarding the psychosocial components of the programme, and they felt that this negatively influenced the overall motivation in the whole group. Perhaps these patients should be treated separately.

In summary, the findings supported that both contextual and psychosocial variables relate to relapse, substance use and perceptions of treatment and recovery among patients who have manifested substance use disorders. A practical implication is that many of the interventions needed to facilitate recovery among patients with substance use disorders could take place at the community level rather than be solely conducted within the context of specialised treatment facilities. Because relapse after treatment discharge is common among these patients, programme developers and decision-makers should focus on measures that could reduce the relapse risk among these patients. In line with the behavioural choice theory, Community Reinforcement Approaches (CRA) aimed at facilitating alternative competing activities (e.g. work, education and physical activity) to substance use could reduce the relapse risk after treatment. In addition, clinicians could teach patients how to identify relapse-preceding cues based on the relapse prevention model (e.g. intra-psychological negative affect or substance using individuals from the patients' social environment). Moreover, the present thesis has identified patterns in the time intervals from treatment discharge to relapse. Some of the specific risk groups for relapse were also identified and countermeasures to reduce the relapse rates within these groups have been suggested. Previous research has tended to focus on the importance of psychiatric diagnoses for relapse. Notwithstanding the potential importance of such diagnoses, further research could also take contextual and psychosocial variables into account. The present work

contributed to the current literature in that it also focused on variables related to social and material resources in relation to relapse, substance use and perceptions of treatment and recovery processes. Moreover, the results supported potential gender differences in the life stress models of substance use, as negative life events solely predicted substance use among males. Future research should gear longitudinal studies to investigate gender differences in the relations between life events, psychosocial distress, self-efficacy and substance use over time. Such studies could provide further insights into the dynamics of relapse and recovery processes of this patient group. The results also showed that the social relationships established in the treatment programmes are important for the patients. The study based on semi-structured interviews suggests that these relationships are an integral part of patients' motivation and persistence in treatment. Research in the future could focus on the social conditions within the clinics and relate these variables to patient outcomes.

Summary [no]

Hovedformålet med denne avhandlingen var å undersøke psykososiale og kontekstuelle faktorer med potensiell betydning for tilbakefall, rusmiddelbruk og oppfatninger av behandlings- og bedringsprosesser hos pasienter med rusavhengighet. Avhandlingen er basert på to ulike datamaterialer. Studie I, II og III er basert på en tverrsnittsundersøkelse gjennomført blant et pasientutvalg (N = 352) som ble rekruttert fra 16 behandlingssenheter for rusavhengighet i Norge. Studie IV er basert på et materiale etablert gjennom semi-strukturerte intervju av 13 pasienter som ble rekruttert fra seks behandlingssenheter i Midt-Norge. De inkluderte klinikkene dekket de fleste spesialiserte tverrfaglige behandlingstiltak for rusmisbruk i Norge. De fleste av disse klinikkene gjennomførte psykososiale behandlingstiltak for blandingsmisbruk og dekket korttidsbehandling i institusjon (inntil seks måneder), langtidsbehandling i institusjon (utover seks måneder), poliklinisk behandling og legemiddelassistert rehabilitering (LAR). Disse behandlingssenheterne benyttet en rekke ulike behandlingsmetoder som blant annet omfatter intervensjoner basert på kognitiv terapi, motiverende intervju, familierapi, miljøterapi, vedlikeholdsbehandling og intervensjoner i terapeutiske samfunn. Flere av klinikkene tilbydde også rådgivning i forbindelse med økonomi og etablering av bolig. I tillegg jobbet flere av enhetene aktivt med kommunalt hjelpeapparat for å etablere arbeidsaktiviteter for pasientene etter behandling.

Det teoretiske rammeverket for undersøkelsene var stressmodeller utviklet for prediksjon av rusmiddelbruk. Blant disse er selv-mediseringshypotesen og livsstress-modellen sentrale bidrag. Disse modellene argumenterte for at rusbruk kan forstås som tiltak for å håndtere psykologiske symptomer og mellommenneskelige problemer (psykososiale faktorer). Selvmediseringshypotesen argumenterte for at rusavhengighet forårsakes av behov for å lindre psykologisk stress som igjen blir forårsaket av underliggende psykiske lidelser. I følge livsstress-modellen blir sannsynligheten for rusbruk regulert av stressnivået til individene og eventuell tilstedeværelse av modererende faktorer som for eksempel sosial støtte, sosial kompetanse og ressurser.

Teori knyttet til atferdsvalg og rusbruk var også relevante for undersøkelsene. Denne teorien fokuserte på at rusbruk og tilbakefall til rusbruk kan forstås som en mangel på alternative arenaer for mestring og belønning. Teorien argumenterer for at rusbruk kan reduseres eller unngås gjennom å etablere konkurrerende aktiviteter til rusbruk som for eksempel arbeids eller utdanningsaktiviteter. Studiene fokuserte derfor også på kontekstuelle variabler som kan være viktig for den daglige fungering for disse pasientene. Slike variabler kan for eksempel være yrkesrelaterte aktiviteter og materielle ressurser som pasientene har til rådighet. Demografiske

variabler som kjønn og alder ble også vurdert som relevant innenfor dette rammeverket. Det er imidlertid viktig å notere seg at avhandlingen ikke hadde som formål å validere disse omfattende teoriene og modellene. Imidlertid utgjorde disse teoriene og modellene det teoretiske grunnlaget for det empiriske arbeidet. Avhandlingen anser rusavhengighet som en samfunnspsykologisk utfordring. Det var forventet at resultatene fra undersøkelsene ville ha implikasjoner både for klinisk praksis, ettervernsstrategier og tidlig intervensjon.

Studie I undersøkte tidsintervallet fra avsluttet behandling til tilbakefall blant pasientene. Kontekstuelle og psykososiale faktorer som økte eller reduserte dette tidsintervallet ble også utforsket. Funnene indikerte at risikoen for tilbakefall var svært høy i de første månedene etter behandling. I tillegg viste resultatene at ungdom hadde høyere sannsynlighet for tidlige tilbakefall sammenlignet med eldre pasienter. Pasienter som opplevde tidlige tilbakefall hadde høyere sannsynlighet for å være arbeidsledige, og høyere sannsynlighet for å bruke opioider eller alkohol som sine hovedrusmiddel. Pasienter som hadde en komplisert behandlingshistorikk med deltagelse i en rekke forskjellige behandlingsprogrammer tenderte til å ha tidligere tilbakefall enn pasienter som kun hadde deltatt i en type behandlingsprogram. Både kort- og langtids døgnbehandling var assosiert med en økt periode fra utskrivning til tilbakefall. Ettervernsstrategier og behandlingsoppfølging kan fokuseres spesielt inn mot de første månedene etter behandling. Et godt mottiltak kan være å initiere arbeids- og utdanningsrelaterte aktiviteter for pasientene før de forlater behandlingsenhetene. Økt fokus på risikopersepsjon knyttet til rusmiddelbruk kan redusere risikoen for tilbakefall blant ungdom. Klinikere kan forsøke å forsterke den indre motivasjonen for behandling hos disse pasientene. Den økte risikoen for tidlige tilbakefall blant yngre pasienter tyder også på at det kan være viktig med forbyggende virksomhet i kommunene.

Studie II undersøkte en teoretisk modell hvor signifikante livshendelser, mellommenneskelig og psykologisk stress og mestring (self-efficacy) predikerte rusbruk. Det ble også gjennomført undergruppeanalyser av disse sammenhengene blant menn og kvinner. Resultatene viste at både negative og positive livshendelser hadde sterkere relasjon til rusmiddelbruk blant menn. Psykiske plager var sterkt knyttet til rusmiddelbruk blant begge kjønn, men denne relasjonen var noe sterkere blant kvinnene i undersøkelsen. Mellommenneskelig stress var assosiert med psykiske plager, men en direkte relasjon til rusmiddelbruk ble ikke støttet av de empiriske data. Funnene kan rettferdiggjøre at det benyttes ulike kliniske tilnærminger når menn og kvinner med rusavhengighet blir konfrontert med stressende livshendelser. Mannlige pasienter kan ha nytte av å lære mer adaptive

mestringsstrategier enn rusbruk når de blir eksponert for slike hendelser, mens kvinner kan dra større nytte av å etablere og oppsøke støttende sosiale nettverk. Den sterke relasjonen mellom psykologisk stress og rusbruk indikerer også et behov for å øke den psykologiske kompetansen i tverrfaglig spesialisert rusbehandling.

Formålet med studie III var å undersøke om pasienter med høyt eller lavt forbruk av illegale rusmidler eller alkohol rapporterte ulik symptombelastning på dimensjoner av psykososialt stress operasjonalisert i Symptom Checklist-90-Revised (SCL-90-R) og Inventory of Interpersonal Problems – Circumplex (IIP-C). Resultatene viste høyere forekomst av slik symptombelastning i gruppene som hadde høyt forbruk av slike rusmidler. I tillegg viste funnene at den overordnede forskjellen i symptomtrykk var sterkere for illegale rusmidler sammenlignet med pasienter som hovedsakelig hadde høyt forbruk av alkohol. Svært få pasienter hadde høyt forbruk av både illegale rusmidler og alkohol. En mulig årsak til disse resultatene kan være at pasienter som har et høyt forbruk av illegale rusmidler blir mer stigmatisert enn pasienter som primært har et høyt alkoholkonsum. En mulig årsak til dette er at alkohol er et legalt rusmiddel, og blir ofte konsumert i akseptable sammenhenger (for eksempel på restauranter og puber) blant den generelle befolkningen. Dette kan også henge sammen med at pasienter med høyere alkoholforbruk hadde mer kontekstuelle ressurser tilgjengelig enn pasienter som hovedsakelig hadde høyt forbruk av illegale rusmidler. Forskjellene i psykologiske symptomer knyttet til alkoholforbruk var sterkest for angstlidelser, mens forskjellene vedrørende illegale rusmidler var distribuert utover en rekke ulike symptomer. Dette kan tyde på at de beroligende effektene av alkohol har en viktig funksjon for pasienter med angstsymptomer. Pasienter som bruker illegale rusmidler synes å være sårbar for en rekke ulike emosjonelle symptomer. Det var få gruppeforskjeller knyttet til mellommenneskelige problemer, noe som styrker en antagelse om at mellommenneskelige vansker har en indirekte relasjon til rusbruk.

Studie IV undersøkte psykososiale og kontekstuelle faktorer knyttet til hvordan pasientene opplevde prosesser tilknyttet behandling av rusavhengighet. Det ble også fokusert på kontekstuelle og psykososiale faktorer knyttet til pasientenes bedringsprosesser. Selv om studie IV er plassert mot slutten av avhandlingen, så var dette den første studien som ble gjennomført i sammenheng med doktorgradsavhandlingen. Ettersom denne studien indikerte at kontekstuelle og psykososiale variabler, som for eksempel terapeutiske relasjoner, sosial støtte og tilgjengelige materielle ressurser, var viktig for pasientenes rehabilitering fokuserte de påfølgende studiene primært på kontekstuelle og psykososiale variabler i sammenheng med tilbakefall og rusbruk. Spesifikt viste resultatene at pasientene

fokuserte på forbedringer innenfor en rekke problemområder som for eksempel psykisk helse, konsum av rusmidler og sosial fungering. Pasientene fokuserte også på å etablere arbeidsrelaterte aktiviteter, bolig og bedring av egen privatøkonomi. Den terapeutiske relasjon og den gjensidige støtten blant pasientene på behandlingsenhetene ble gjentatte ganger løftet fram når pasientene fortalte om hvilke kontekstuelle og psykososiale faktorer som var viktige under behandlingen. Pasientene hadde både positive og negative erfaringer med hvordan disse relasjonene påvirket deres behandlingsmotivasjon. På den ene siden fokuserte pasientene på de positive aspektene ved å bli møtt med en tillitsfull og respektfull holdning fra klinisk personell. I følge pasientene var dette endringsfremmende i seg selv. Pasientene rapporterte også at medpasienter hadde overtalt dem til å forbli i behandlingsopplegget når de ble fristet til tilbakefall eller til å avslutte behandlingen før den var fullført. På den andre side var det et sterkere negativt fokus blant pasienter som var i behandling sammen med personer som fikk metadon eller buprenorfin som en del av behandlingsopplegget. Pasienter som ikke mottok opiatsubstitutter fortalte at pasienter som mottok slike substitutter hadde mindre motivasjon for å delta i de psykososiale komponentene i behandlingsprogrammene. I følge pasientene som ikke mottok opiatsubstitutter påvirket dette den generelle motivasjonen og stemningen på klinikken i en negativ retning. En kan stille spørsmål om det å behandle disse pasientene innenfor samme system er en god strategi.

Oppsummert så understøttet funnene at både psykososiale og kontekstuelle variabler er relatert til tilbakefall, rusmiddelbruk og oppfatninger av behandlings- og bedringsprosesser blant pasientene. En praktisk implikasjon er at intervensjoner som sikter mot å bedre pasientenes mestring av rusavhengighet også bør foregå i kommunene på samfunnsnivå, og ikke bare innenfor konteksten av spesialiserte kliniske enheter for rusmisbruk. Etersom tilbakefall er vanlig blant denne pasientgruppen kan programutviklere og tilknyttet administrasjon se nærmere på tiltak som kan redusere risikoen for tilbakefall. I tråd med teorier om atferdsvalg så kan CRA-tilnæringer som sikter mot å etablere alternative konkurrerende aktiviteter til rusbruk (for eksempel arbeid og fysisk aktivitet) redusere risikoen for tilbakefall etter behandling. I tillegg kan klinikere forsøke å lære pasientene å identifisere både interne og eksterne signaler som kan øke sannsynligheten for tilbakefall i tråd med modeller for tilbakefallsprevensjon. Slike signaler kan for eksempel være negativ intra-psykologisk affekt eller spesielle personer i pasientens sosiale miljø. I tillegg har den foreliggende avhandlingen bidratt til å identifisere mønster i tidsintervallene fra utskrivning til tilbakefall blant pasientene, og noen av risikogrupperne for tilbakefall er identifisert. Konkrete tiltak for å redusere

tilbakefall blant disse risikogrupperne er foreslått. Tidligere forskning har hatt en tendens til å overfokusere på betydningen av psykiatriske diagnoser for tilbakefall. Selv om disse diagnosene kan være sentrale for tilbakefall, bør videre forskning også ta i betraktning variabler tilknyttet konteksten som pasientene befinner seg i. Et annet bidrag til dette forskningsområdet er derfor at sosiale og materielle ressurser blant pasientene ble tatt i betraktning i tillegg til variabler knyttet til psykologisk og sosial fungering. Videre pekte resultatene i retning av at det kan foreligge kjønnsforskjeller i stressmodellene for rusbruk ettersom negative livshendelser kun predikerte rusbruk blant menn. Følgelig bør det initieres longitudinelle studier som undersøker kjønnsforskjeller i relasjonene mellom livshendelser, psykososialt stress, mestring og rusbruk over tid. Slike studier kan også gi bedre forståelse for dynamikken i tilbakefall og bedringsprosessene blant denne pasientgruppen. Resultatene viste også at de sosiale relasjonene innad i behandlingsprogrammene er viktige for pasientene. Resultatene fra studien som var basert på semi-strukturerte intervju tydet på at disse relasjonene er relevante for pasientenes behandlingsmotivasjon og persistens til å bli i behandlingsprogrammene. Videre forskning kan fokusere på variabler knyttet til sosiale forhold innad i klinikkene og knytte dette mot behandlingsutfall blant pasientene.

1. Introduction

1.1. Background and aims of the thesis

The prevalence rates of harmful substance use are high in Norway. According to the Norwegian Institute for Alcohol and Drug Research the estimate of those who inject heroin or amphetamine in Norway was between 8600 and 12 600 individuals in 2007 (Amundsen, 2009). In 2006, about 10% of Norwegians aged between 21 and 30 years reported amphetamine use during their lifetime. About 8% reported that they used cocaine and crack, whereas 6% had used ecstasy (Vedøy & Skretting, 2009). According to the same study, about 10% of Norwegian individuals aged between 15 and 20 years reported that they had tried cannabis during their lifetime between 2006 and 2008. It is difficult to estimate the number of Norwegians who consumes harmful levels of alcohol. Were we to define a harmful consumption level as an average of 10 centilitres or more pure ethanol consumed daily over a one year period, the estimate of heavy alcohol consumption is between 60 000 and 70 000 Norwegians (The Norwegian Medical Association, 2006). Thus, legal substances such as alcohol also contribute to harmful substance use in the Norwegian population.

Substance use often derives from relatively positive motives such as excitement seeking (Bardo et al., 2007), curiosity (Kashdan et al., 2004) or as a mean to broaden consciousness or reinforce religious experiences (Helman, 2001). People may also use substances to fit into specific social groups (Graham et al., 1991) or because the substances yield sedative psychopharmacological effects (Hendrickson et al., 2004). Most people who use substances do not develop a substance addiction (O'Brien & McLellan, 1996). According to the International Classification of Diseases-10 (ICD-10) (World Health Organization, 1993), substance addiction can manifest when an individual continues to use substances despite adverse psychological and social consequences and desires to stop or reduce the consumption. Another criterion is that the individuals experience problems when attempting to control both the amounts of substance consumption and the durability of intoxication episodes. Tolerance and abstinence symptoms may also develop along with the addiction. The individual often neglects other activities and obligations in order to become intoxicated (see also section 1.2.1.).

For individuals who develop a substance addiction, the disorder often has severe consequences for the individuals themselves, significant others and society. Treatment usually uses a broad approach for this disorder. This was, for instance, conceptualised by the biopsychosocial model (BPS) (Engel, 1977) where biological, psychological and social variables are considered in relation to disease.

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Despite such efforts, patients often relapse and return to substance use after a period of abstinence in treatment (Hunt et al., 1971; Marlatt & Gordon, 1980). This reflects that additional factors to treatment interventions and clinical programmes should be investigated to establish knowledge about predictors of relapse and substance use among this patient group. Treatment interventions aimed to teach the individuals relapse-preventing strategies are likely to influence the relapse risk and substance use in this patient group (Marlatt & Gordon, 1985). However, psychosocial factors, such as mental health, social functioning and significant life events, may also influence relapse rates and substance use among these patients (Hammerbacher & Lyvers, 2006; Melberg et al., 2003). In addition, research has shown that contextual factors, such as occupational activities (Reece, 2007), are relevant when considering relapse risk and substance use among individuals with substance use disorders. Hence, it was of interest to examine psychosocial and contextual factors related to relapse and substance use among these patients.

Information about contextual and psychosocial factors associated with relapse and substance use may not only be relevant for clinical interventions carried out at the treatment facilities, but also yield equally important contributions to aftercare and community-based interventions. Were we to collect and analyse the necessary information about the risk factors for relapse and substance use, aftercare could be targeted towards specific risk groups of patients. This is in line with a community psychological approach to substance addiction. Interventions should not solely be carried out in a strictly delimited clinical context, but could also take place among individuals outside the clinic. This idea is congruent with the aims of the coordination health reform (Norwegian Ministry of Health and Care Services, 2009). This reform was meant to facilitate communication and integrate community-based health services and clinical hospitals.

In 2004, the responsibilities for treatment and rehabilitation services for individuals with substance addiction were transferred from the Norwegian counties to the regional health care trusts. Simultaneously, treatment of substance use disorders were described as multidisciplinary specialised services for substance use (Karterud et al., 2009; Nesvåg & Lie, 2007). In the central region of Norway, the reform resulted in the establishment of a dedicated multidisciplinary hospital trust for substance addiction treatment, namely the Drug and Alcohol Treatment in Central Norway. Other implications of the reform were increased focus on interactions between public and private service programmes and increased collaboration between primary health care, social services and specialised health care services. In addition, there were new patient rights: Patients with substance

addiction obtained the same rights to high quality health care services as patients in psychiatric and somatic health care (Nesvåg & Lie, 2007).

Despite these structural developments research concerning contextual and psychosocial factors of potential importance for how patients perceive their treatment and recovery processes remains relatively scant. Treatment processes were defined as processes that can take part both within and outside the treatment facilities (e.g. patients' perceived quality of treatment therapies, aftercare and communication between the treatment facilities and the patient) (Bacchus et al., 1999). Anthony (1993) defined recovery processes as individually differentiated changes in, for instance, emotions, goals, attitudes and overall functioning. When an individual recovers from a disorder, the individual may rediscover meaning and purpose in life without being dominated by the influences of the disorder.

Research could investigate the users' perspective by examinations of contextual and psychosocial factors of potential relevance for how patients perceive the quality of the provided health services. The user perspective has often been overlooked in addiction research (Laudet et al., 2009). Service user satisfaction and perceptions of treatment and recovery processes are likely to be significant quality indicators of health services (Finney & Moos, 1984; Jones et al., 1994). Perceptions related to the qualities of social processes and the information flow at the treatment facilities may be associated with patient satisfaction (Jørgensen et al., 2009). Such satisfaction may in turn relate to substance use outcomes (Carlson & Gabriel, 2001). McLellan and Hunkeler (1998) argued that patients' perceptions of treatment could be important performance parameters for programme developers and clinicians. Therefore, it was of interest to obtain a further elaboration of which psychosocial and contextual factors that are important for patients' perceptions of treatment and recovery processes.

The thesis is based on data materials established among patients from inpatient and outpatient facilities for substance use disorders in Norway. These facilities mainly carried out psychosocial treatment interventions for poly-substance use. Psychosocial treatment interventions are generally non-pharmacological and aimed at improving coping abilities related to substance use disorders (Malhotra et al., 2005). A meta-study showed that such treatment approaches are relatively effective at reducing patients' substance use and improving their social, emotional and cognitive functioning (Dutra et al., 2008). One of the treatment units included in the present thesis carried out Opioid Maintenance Treatment (OMT). This treatment approach is carried out as psychosocial outpatient treatment for two years assisted by opioid substitutes (i.e. methadone or buprenorphine). Thereafter, the patients are transferred to an open-ended aftercare system in the communities. This

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approach has shown improvements in patients' overall coping resources and employment rates (Waal et al., 2009). However, researchers have also argued that contextual and psychosocial factors may be important for outcomes related to relapse and substance use among patients with substance use disorders (Ravndal, 2007). Furthermore, research has shown that patient outcomes do not differ significantly across different treatment programmes and modalities (e.g. Asay & Lambert, 1999; Project MATCH Research Group, 1993; UKATT Research Team, 2005a, 2005b). Thus, the main purpose of the present thesis was not to investigate the effects of specific treatment interventions, but to study contextual and psychosocial variables that could influence patients' recovery.

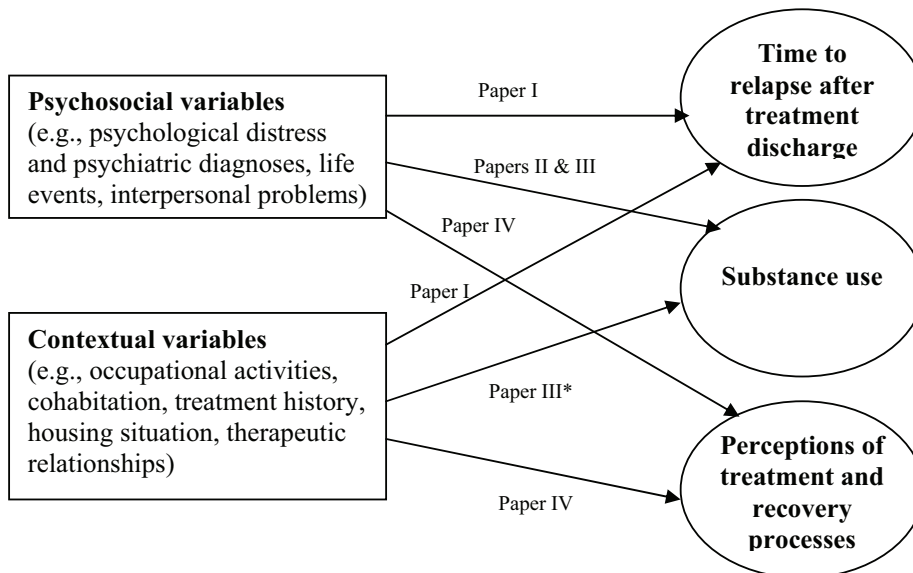
1.1.1. Main aims of the thesis

The core aim of the present thesis was to investigate contextual and psychosocial factors related to relapse and substance use among patients with substance use disorders. An equally important additional aim was to examine psychosocial and contextual factors of potential relevance for how patients perceived their treatment and recovery processes.

Relapses were expected to be related to a lack of alternative rewarding activities to substance use as is stated in behavioural choice theory (Bickel & Vuchinich, 2000). Therefore, it was of interest to examine relapse in relation to factors with potential importance for the everyday functioning of individuals. These factors could be operationalised by occupational activities, economic income, housing situation and cohabitation status of the individuals. In addition, variables concerning psychiatric disorders, substance use characteristics and treatment background were considered in relation to relapse. On the basis of previous work (e.g. Hammerbacher & Lyvers, 2006; Marlatt & Gordon, 1985; Segrin, 2001), it was assumed that psychological factors, such as psychosocial distress and self-efficacy, would predict substance use. Stressful life events were also considered relevant for substance consumption, because many individuals may use substances to reduce the impact of such events (Melberg et al., 2003; Wills et al., 1992). These assumptions are in line with the theoretical framework of stress models regarding substance use (e.g. Aneshensel & Huba, 1984) and the self-medication hypothesis (Duncan, 1974; Khantzian et al., 1974). It was also expected that psychosocial distress would differ according to patients' self-reported severity levels of substance consumption (Landheim et al., 2006). To the author's knowledge, there are few published Norwegian studies regarding contextual and psychosocial factors related to how patients perceive their treatment and recovery processes. The expectation was that the patients would focus on a great variety of

contextual and psychosocial factors because patients with substance addiction experience challenges in a variety of domains related to their functioning. Therefore, a methodology based on semi-structured interviews was considered most suited to investigate such factors in further detail.

Figure 1 illustrates the aims of the thesis. As shown, the core aim of paper I was to investigate psychosocial (e.g. psychiatric diagnoses) and contextual variables (e.g. occupational activities and cohabitation status) related to relapse. The core aim of paper II was to test a model where psychosocial variables (i.e., significant life events, psychological distress, interpersonal problems and self-efficacy) predicted substance use. The main objective of paper III was to investigate differences in psychological distress and interpersonal problems among patients who manifested high and low severity levels of illicit substance use or alcohol. The aim of paper IV was to explore psychosocial and contextual variables related to patients' perceptions of treatment and recovery processes. The following section discusses empirical studies and theoretical models related to the contextual and psychosocial factors examined in relation to relapse, substance use and perceptions of treatment and recovery in the empirical papers. For a thorough overview of the specific aims and research hypotheses the reader is referred to section 1.3.



* Contextual variables included as statistical covariates

Figure 1. Illustration of the aims of the thesis

1.2. Theoretical and empirical background

1.2.1. Substance addiction

Substance addiction is a complex construct and a concise definition has yet to be formulated. The criteria for substance addiction in the ICD-10 manual and the Diagnostic Statistical Manual IV-Text Revision (DSM-IV-TR) (American Psychiatric Association, 2000) have shown satisfactory psychometric properties (Saunders, 2006). When substance addiction is diagnosed, these criteria are used along with a holistic consideration about the overall functioning of the individual. The ICD-10 (World Health Organization, 1993) proposed that three of the following criteria should occur in parallel during a one year period before substance addiction can be diagnosed:

- A strong desire to consume substances;
- Problems with controlling the substance consumption (e.g. time of onset, termination, levels of use);
- Physiological abstinence symptoms when substance use is stopped or reduced;
- Increased amount of substances is necessary to obtain the desired effects (i.e. development of tolerance symptoms);
- Other interests of importance are neglected because of activities related to substance use;
- Continuous use despite the manifestation of harmful consequences.

A relatively similar operational definition of substance addiction is included in the DSM-IV-TR (American Psychiatric Association, 2000). According to this manual, substance addiction manifests when individuals use substances to relieve problems associated with psychosocial distress. From this perspective, substance addiction develops as symptoms of other underlying psychological problems. Substance addiction can develop when an individuals' consumption is out of control and has adverse consequences for the overall functioning of the individual. Adverse consequences, depending on the individual, could mean generally worsened psychological and somatic symptoms, deteriorated interpersonal relationships and reduced capabilities to participate in important activities such as employment and education. An important criterion is that these consequences exist over a 12-month period. According to the DSM-IV-TR, substance addiction could have developed when the person continues to use substances despite adverse consequences and has a personal desire to reduce or stop consumption.

Furthermore, these psychological processes are often accompanied by the development of tolerance and abstinence/withdrawal symptoms. Tolerance

symptoms are present when the person needs to increase the dose to obtain the desired effects of the substances. Abstinence or withdrawal symptoms refer to physiological or psychological craving symptoms, which usually manifest when substances are unavailable or the consumption is reduced (Crowley et al., 1998). Examples of withdrawal symptoms are shivering, restlessness or a strong mental desire to become intoxicated. Although the present thesis mainly focuses on substances such as heroin, amphetamine, cocaine, cannabis, alcohol and benzodiazepines, addictive potentials are not limited to these substances. Substance addiction may also develop from secondary stimulants such as caffeine and nicotine. DiClemente (2003) argued that substance addiction is the continuous and self-destructive use of any pharmacological substance that the person finds difficult to control.

The distinction between substance abuse/misuse and addiction should be discussed. Both researchers and clinicians often use the terms ‘substance abusers’ and ‘addicts’ interchangeably (e.g. Caplehorn & Deeks, 2006; Schubiner et al., 2000). These terms are also frequently used in the mass media. Differentiations between these terms are not only important for a proper academic understanding of substance-related concepts, but may also have clinical implications. Substance abuse is usually characterised by maladaptive use of substances, but usually constitutes a less severe magnitude than an addiction (Crowley et al., 1998). Substance abuse could be considered a normative term, where substances are used in a pattern that is socially and culturally unacceptable (Bramness et al., 2009). According to DiClemente (2003) substance abuse refers to a maladaptive pattern of substance use accompanied by adverse biological, psychological and social consequences. Though the person has not necessarily developed an addiction in line with diagnostic criteria, the substance use continues despite adverse consequences.

Stigmatisation includes discrediting attitudes, stereotypes, beliefs and attributions to people who are members of specific social categories (Crocker & Major, 1989) such as ‘substance abusers’. Despite controversy (see e.g. Bramness et al., 2009), research indicates that the diagnostic definition of substance addiction does not necessarily result in stigmatisation of patients (Johnsen & Nygaard, 1995). Kelly and Westerhoff (2010) argued that the term ‘substance abuse’ could indicate that substance use with adverse consequences is a voluntary and controlled behaviour, which implies that the person is capable of stopping or reducing consumption by mere will. Furthermore, the authors reasoned that ‘addiction’ or a ‘substance use disorder’ are medical terms, and use of these terms creates the perception that the person is a victim and substance consumption is less

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controllable. This was tested in a randomised study where clinicians read texts about a patient who had used substances while in treatment. The texts were identical, but the first text described the patient as a ‘substance abuser’ and the second text described the same patient as having a ‘substance use disorder’. Clinicians who were randomised to the group which read ‘substance abuser’ were more likely to agree that the patient had personal responsibility and control over his consumption. They were also more likely to agree with the statement that sanctions were an appropriate response to this patient’s actions.

The findings in the study presented above influenced the terms used in the present thesis. All patients involved in the present study had been enrolled in specialised treatment services for substance use disorders. This implies that they had experienced their substance consumption as difficult to control and that the substance-related consequences were relatively strongly manifested (O’Brien & McLellan, 1996). In addition, many patients had been subjected to screening for substance-related problems or undergone other professional considerations before they were referred to treatment by medical doctors or social services. Hence, it is likely that a majority of patients approached the criteria for substance use disorders as stated in the ICD-10.

The present thesis employs the ICD-10 definition of substance addiction. Substance addiction and substance use disorders refer to the same concept and were used interchangeably for the sake of language variation. The terms ‘substance abuse’ and ‘substance abuser’ were avoided because of potential stigmatising effects, and instead, terms such as maladaptive, harmful or excessive substance use are used to refer to substance consumption with potential adverse consequences for the individual or surroundings. Substance use refers to the consumption of illegal and legal substances such as heroin, cocaine, cannabinoids, psychopharmaca and alcohol. Nicotine and caffeine use were excluded from this definition because the treatment facilities did not cover treatment for these substances.

Although substance use disorders are associated with high relapse potentials and often accompanied by co-occurring psychiatric disorders, substance use disorders are generally regarded as treatable (Cami & Farré, 2003). In Norway, patients are usually referred to specialised treatment for substance use disorders by medical doctors or by personnel in community social services. In some cases, involuntary treatment and treatment alternatives to imprisonment are carried out (§12 treatment). Before the referral is conducted, the following information is obtained from the individual patient:

- A detailed description of the manifested problems/disorders;
- Elaboration of the medical history;

- Information about the family and social relations;
- Results from relevant assessments and investigations;
- Treatment history in community services and specialised treatment services;
- Information from a medical doctor, social workers and other relevant health care departments;
- Status regarding an individual treatment plan;
- Suggestions for types of interventions and programmes.

Before the patients are considered for enrollment to a specific treatment programme, multidisciplinary assessment teams consisting of medical doctors, psychologists and social workers evaluate the above mentioned aspects of the patient's functioning. The multidisciplinary assessment teams assess whether the criteria for treatment are fulfilled and may be able to recommend a specific treatment programme for the person. The treatment criteria are operationalised using a checklist, which was standardised in Norway. The criteria range from the severity level of addiction-related problems to co-occurring psychiatric disorders (see *The Drug and Alcohol Treatment in Central Norway, 2010*).

Most of the treatment centres for substance use disorders in the central region of Norway are relatively small. When the present study was carried out the number of patients enrolled in these treatment sites ranged from 20 to 360 persons. Because patients with substance use disorders usually manifest challenges related to somatic, psychological and social well-being, treatment facilities for substance use disorders carry out many interventions targeted at improving these domains of patient functioning. The treatment programmes currently available in the central region of Norway range from open-ended outpatient treatment to long-term (exceeding six months) and short-term (lasting up to six months) inpatient treatment. The majority of these treatment programmes are psychosocial programmes geared towards poly-substance users. However, there are treatment programmes that administer opiate substitutes (i.e. methadone or buprenorphine) along with psychosocial interventions. One of the preconditions for medically assisted treatment is that the patient has manifested opioid addiction.

Before psychosocial treatment interventions are carried out the patients usually undergo detoxification. The majority of treatment facilities include individual therapy using, for instance, motivational interviewing, cognitive therapy, cognitive behavioural therapy and relapse-prevention training. Group therapy, milieu therapy and family therapeutic approaches are also carried out. Most of the treatment facilities also offer the patients physical activities and training, somatic treatment and guidance related to accommodation and economic issues. The clinics usually

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refer patients to community services and programmes before they discharge them from treatment. Both international and national outcome studies have revealed that such approaches are relatively effective in improving patient coping and functioning. McLellan et al. (1982) evaluated six interdisciplinary programmes for substance addiction and found that the patients significantly reduced their substance use after treatment. In addition, the patients reported less criminal behaviour and improved psychological functioning and were more capable of participating occupational activities than before treatment. Dutra et al. (2008) conducted a meta-study of 34 well-controlled studies regarding psychosocial treatment approaches for substance use disorders. Interventions based on contingency management, relapse prevention and cognitive behavioural therapy had stronger effects on substance use outcomes. Overall, the effect sizes ranged from medium to strong for the psychosocial interventions. The authors argued that this is equivalent to results found in general psychiatric health care.

Cochrane reviews also indicated that people who underwent treatment in therapeutic communities with aftercare reported reduced substance use and criminal acts after treatment (Perry et al., 2006). Denis et al. (2006) reported that the effectiveness of outpatient treatment for cannabis addiction was not well documented. However, cognitive behavioural theory, coupled with contingency-management or motivational therapy may be associated with reduced cannabis use. Ferri et al. (2006) reported that the effectiveness of different 12-step programmes for alcohol addiction were inconclusive. Mayet et al. (2005) argued that psychosocial interventions alone do not have the desired effects upon patients with opiate addiction. However, Amato et al. (2008) argued that psychosocial interventions combined with methadone or buprenorphine substitutes improved the compliance and completion rates among patients. This combination also reduced the use of other opioids. An uncontrolled outcome study in Norway showed that 30% to 40% of the patients who had attended different treatment approaches for substance use disorders reported abstinence at follow-up (Melberg et al., 2003). The patients also reported significant reductions in criminal behaviour. In spite of a growing body of research that shows different treatment approaches to have different effects for this patient group, well-controlled studies have shown that given relatively similar clients, outcomes do not differ significantly across different treatment programmes and modalities (De Weert-Van Oene et al., 2001; Project MATCH Research Group, 1993; UKATT Research Team, 2005a, 2005b). Since research mainly supports the idea that treatment reduces substance use and improves patient coping and functioning, the present thesis did not focus on the effectiveness of the interventions themselves. The thesis focused on psychosocial

and contextual prognostic factors that may also be associated with variables such as relapse and substance use.

1.2.2. Relapse to substance use

A relapse to substance use could be conceptualised by increased levels of substance consumption, either after a period of abstinence or after a period with lower levels of consumption (Brownell et al., 1986; DiClemente, 2003; Marlatt & Gordon, 1980; McKay, 1999). A distinction should be made between lapses and relapses. Lapses could be regarded as minor occurrences of substance use, where the person temporarily returns to previous substance use habits. Brownell et al. (1986) argued that this is not uncontrollable substance consumption. During a lapse the individual can yet adjust behaviour in time to re-establish abstinence. Relapse is usually preceded by lapses. The severity levels and frequencies of lapses required for a relapse to occur vary across individuals (Brownell et al., 1986). Whether a lapse results in a relapse also depends on how the individual responds to the lapses. For instance, if the individual interprets minor incidents of substance use as a relapse, it could result in a self-fulfilled prophecy (DeJong, 1994). Perhaps a prerequisite of a relapse is that the substance use is perceived as uncontrollable by the individual. This could indicate that the person was unable to maintain the behavioural changes obtained during the abstinence period in treatment (DiClemente, 2003).

Marlatt and Gordon (1985) concluded that risk factors for relapse can be categorised into negative and positive emotional states, social conflicts, temptations or urges and peer pressure to consume substances. The level of coping skills established by the individual may also reduce or increase the likelihood of a risk factor leading to a relapse. The potential of relapse is likely to increase when patients leave the controlled treatment environment and enter the more uncontrolled context of their daily lives, which may offer substance availability and situations associated with substance use that trigger substance craving. The temptation to use substances may increase with the removal of control mechanisms such as urine tests and the patients have to rely on their coping resources (Brewer, 1993; Chutuape et al., 2001).

Yet, relapses after treatment can be regarded as process variables, and as such, a part of the recovery cycle rather than an indication of failure. Prochaska et al. (1992) stressed that an individual proceeds through six stages of change during behavioural changes. First, the individual is in a pre-contemplation stage in which he/she does not realise the negative consequences of substance use and does not intend to alter the addictive behaviours. The change process is initiated when the individual becomes aware of the negative consequences of substance use and

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desires behaviour change (i.e. reach the contemplation stage of change). During the third stage, termed the preparation stage, the individual investigates information about how to change behaviour (e.g. examine available treatment options or speak to others about how changes will influence their life). Thereafter, the action phase begins and the individual aims at changing the behaviour by obtaining abstinence over a period of time. The maintenance phase is when the individual aims to avoid relapses and continue abstinence over a longer period of time. Finally, the individual may reach the termination phase: the individual has obtained sufficient self-efficacy to resist excessive substance use in various social situations.

Prochaska et al. (1992) suggested that the individuals progress through these six stages of change in a spiral pattern. This means that patients should expect to proceed through these phases several times before a stable behavioural change is established. An implication is that relapses could occur within any of the stages in the model. Hence, re-occurring relapses could be considered as movement from abstinence maintenance to an earlier stage in the process of change model. The particular stage that the patients are in during the relapse can influence how they cope with the relapse as self-efficacy may increase as the individual progresses through the stages. From the perspective of this model, relapses may yield information that could be used to improve coping and to increase the probability of successfully altering the addictive behaviours. Ultimately, the information obtained by relapses are utilised in a way that causes the individual to spend more and more time in the action and maintenance phases of change.

Substance addiction may also produce substantial cognitive and biochemical changes within the individual. For example, excessive substance use could decrease the action potentials in the reward systems in the brain and facilitate the development of maladaptive stress systems within the limbic system (Koob, 2009). These changes may also manifest after treatment. Similar to other chronic disorders, improvement in the coping resources of the patients may be more realistic than a complete cure for the disorder (O'Brien & McLellan, 1996; Sellman, 2009). Accordingly, research has demonstrated that relapse to substance use after treatment is more the rule rather than the exception. Hunt et al. (1971) found that the majority of patients in treatment for heroin and alcohol addiction relapsed during the first three months after treatment. Despite the fact that relapses to substance use are common after treatment, these events are not desirable. One of the core aims of treatment for substance use disorders is to improve on individual abilities to cope without uncontrollable and maladaptive substance use. Relapse after treatment indicates that this objective has yet to be reached. Therefore, research should focus on factors that reduce or increase the relapse risk in this

patient group. This approach may aid programme developers, decision makers and clinicians by identifying risk groups and protective factors that can be focused on in clinical practice and aftercare (Kedia & Williams, 2003).

Several studies have examined factors related to relapse risk after treatment. Previous studies have shown that depressive mood and low levels of social support increase the probability of relapse (Cornelius et al., 2003; Hammerbacher & Lyvers, 2006). An explanation was postulated in the self-medication hypothesis, which asserts that people use substances to alleviate negative emotional stress (Duncan, 1974; Khantzian et al., 1974). In an extension of this assumption, studies have shown that patients with bipolar depression had higher probability of relapse than those not diagnosed with such co-occurring disorders (Tohen et al., 1990). In addition, studies have demonstrated that borderline personality disorder predicts increased likelihood of relapse (Nace et al., 1986). In a Norwegian study, patients with major depression had significantly higher relapse risk than individuals without co-occurring mental disorders (Landheim et al., 2006). However, Schadé et al. (2005) found no significant reduction in relapse rates after treatment when symptoms of anxiety were alleviated in patients with alcohol addiction.

The cited studies mainly investigated co-occurring psychiatric disorders in relation to relapse. Contextual factors, such as occupational activities, may be equally important for maintaining abstinence after treatment. The relevance of contextual factors was underlined in behavioural choice theory (Bickel & Vuchinich, 2000). Within this theoretical framework, relapse to substance use could be interpreted as a lack of alternative rewarding activity to substance consumption. In behavioural choice theory, alternative activities that provide protection against substance use are the more important protective factors of relapse among patients with substance use disorders. As such, the theory argues that alternative activities and rewards may protect individuals from exposure to substance-relevant cues and reduce the availability and possibility to consume substances. Hence, substance use may be more likely to reoccur when other rewarding activities, such as religious activities, physical activities, work and educational activities, are unavailable in the social environment of the individual (Bickel & Vuchinich, 2000; Moos, 2007).

An implication of behavioural choice theory is that relapse could be attributed to lack of resources and factors in the individual's context rather than solely psychological symptoms and withdrawal symptoms. A study by Robins (1974) of veteran soldiers who had been addicted to heroin during the Vietnam War showed that context plays an important role for substance use. Only about 8% of these veterans fulfilled the criteria for heroin addiction a year after they returned to the

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United States. A follow-up two years later showed that this tendency was stable over time (Robins et al., 1980). The majority of the veterans had not received treatment for substance use disorders. Hence, it is possible that individuals who develop an addiction could reduce their substance consumption or stop entirely when the social context and circumstances significantly improve (see also Robins et al., 1975). On the other hand, one could argue that these individuals did not have a particular vulnerability of developing substance addiction. Consequently, it may have been easier for them to reduce or terminate their substance use when they moved to a less extreme social environment.

Xie et al. (2005) broadened the research perspective by investigating demographic and contextual factors related to relapse. The study revealed that relapses were more likely among males and people with a low education level. Individuals who were unemployed or lived alone also had high relapse risk. One study found that older individuals may have lower likelihood of relapse than younger adults (Oslin et al., 2002). Furthermore, substance use characteristics, such as an early onset of substance addiction, may increase the relapse risk (Landheim et al., 2006). Equivocal evidence has been found regarding the role of specific substances for the probabilities of a relapse. On one hand, some studies have demonstrated the importance of such variables (Ciesla et al., 2008; Domino et al., 2005; Salah et al., 2004). On the other hand, several studies did not support an association between specific substances and relapse rates (Hammerbacher & Lyvers, 2006; Hunt et al., 1971; Xie et al., 2005). A reason for the lack of evidence regarding the importance of the role of specific substances could be that the majority of patients with substance addiction are poly-substance users (Curran et al., 2002; DeJong, 1994).

As shown by the cited studies, several factors associated with increased or decreased probability of relapse have been revealed. In addition to some contradictory findings (e.g. Domino et al., 2005; Xie et al., 2005), the majority of studies have mainly focused on co-occurring psychiatric disorders and treatment interventions. These factors are likely to influence the risk of a relapse among patients. However, studies carried out more recently have also demonstrated the importance of contextual variables such as gender, age, education and social support. Research on relapse should investigate both contextual and psychosocial variables given that patients live most of their lives outside the context of specialised treatment services for substance use disorders.

Furthermore, previous studies have mainly focused on general characteristics and variables that explain substance use among patients who experienced relapse. Fewer studies have examined factors associated with a prolonged or reduced time

interval between treatment discharge and relapse. This enquiry is interesting because factors associated with a prolonged period from treatment discharge to a relapse may relate to patients' abilities to maintain the changes achieved during treatment. Conversely, factors associated with a reduced time interval between treatment discharges and relapse may constitute risk factors that inhibit the patients' capability to maintain changes and may also identify particular risk groups with high relapse potential after treatment. If such risk groups are identified, relapse-preventing countermeasures and adjustment to the specific needs of these individuals could be integrated into treatment, aftercare and treatment follow-up. The first aim of the present thesis was to investigate the time interval between treatment discharge and potential relapse among the patients by examining contextual and psychosocial variables that could increase or decrease this time interval.

1.2.3. Psychosocial predictors of substance use

Though substance use among patients is related to a vast number of psychosocial, biological and contextual variables, some of the more important predictors of substance use may be psychosocial factors such as psychological and social distress and external significant life events. Coping cognitions may also be relevant in this line of enquiry. How these factors predict substance use could have clinical relevance for patients with substance use disorders. Treatment for substance use disorders should be tailored to specific patient needs (Melberg et al., 2003), and to do this it is necessary to develop and improve upon the knowledge concerning variables related to contemporary substance use among the patients. Therefore, one of the aims of the present thesis was to test a model that used significant life events, psychological and interpersonal distress and coping cognitions to predict substance use.

1.2.3.1. Significant life events

The stress-diathesis model (Gatchel, 1993) asserts that environmental factors interact with genetic predisposition when psychological symptoms and psychiatric disorders are triggered. If people who have a genetic predisposition for substance use disorders are confronted with major life stressors (i.e. multiple events or conditions that provoke strong demands of coping) the probability of developing substance addiction could increase. Similar to people in the general population, patients with substance addiction experience major positive and negative events in their lives. Several scientists have underlined the importance of significant positive and negative life events in addiction research (e.g. Melberg et al., 2003; Vaglum,

1979). Examples of such events are to give birth, overdose, establishment of close social relationships, fatality of significant others and religious experiences.

Despite these recommendations, few studies have investigated how these life events relate to contemporary substance use and psychological functioning among patients with substance use disorders. Because substance use may partially reflect learned maladaptive responses and coping strategies to such triggering events (Taylor, 2006), it is possible that significant life events reduce or increase substance use according to how they are interpreted by individuals. It is also probable that significant life events relate to psychological symptom load of the patients. Therefore, studies that aim to investigate predictors of substance use should take significant life events into account. This falls in line with the life stress model (Aneshensel & Huba, 1984), which suggests that life stressors and social support are predictors of substance use. From the perspective of this model, substance use is considered as instrumental behaviour for reducing the impact of stressors.

The majority of previous studies that investigated significant life events and psychosocial distress as predictors for substance use were carried out either in the general population or among adolescents. For instance, Newcomb and Harlow (1986) collected data at a university in the United States and found that accumulated negative life events predicted substance use when perceived lack of life purpose and stress controllability were accounted for. Wills et al. (1992) demonstrated that negative life events and contemporary psychological distress predicted nicotine, alcohol and cannabis use among the respondents. Kostelecky (2005) also reached a similar conclusion. In addition, two studies carried out among patients with substance addiction supported negative significant life events as being related to substance use levels (Melberg et al., 2003; Moos et al., 1979). Tate et al. (2006) found that chronic stressors predicted substance use, but failed to demonstrate that recent significant life events were related to substance consumption.

Significant stressful life events may be associated with psychological distress (e.g. symptoms of depression and anxiety). A longitudinal study examined the role of accumulated stressful life events on psychological distress and found that everyday stressors had significant impact on psychological distress (Tein et al., 2000). The authors concluded that stressors related to economic issues and interpersonal conflict could have severe psychological implications for the individual. This has also been supported elsewhere (Leserman et al., 1998; Pillow et al., 1996). It is important to note that none of these studies were carried out among patients with substance use disorders.

The cited studies mainly focused on negative stressful life events; the role of positive life events is less understood. Positive life events could be relevant because these events may have a stress-buffering effect and reduce the probability of substance use (see also Biafora Jr et al., 1994). This was supported in a study which investigated whether life events and psychosocial distress predicted alcohol use among urban adolescents (Scheier et al., 1999). The results showed that both positive and negative life events had implications for alcohol use. Congruent with these findings, Saunders and Kershaw (2006) found that significant positive life events predicted reduced alcohol use among people with alcohol addiction.

It is difficult to determine whether life event are positive or negative because the consequences of life events assumed to be negative could, in some instances, turn out positive and vice versa. A negative event, such as a breakup of an intimate relationship, could be experienced as positive if the relationship was dominated by conflict and violence. The consequences of life events depend on the context in which these events arise and the specific situations of the individuals who are exposed to them. However, previous studies measured life events in a manner that may have imposed specific life events upon the respondents (Holmes & Rahe, 1967; Kostelecky, 2005; Tate et al., 2006; Wills et al., 1992) or predefined whether the effects of life events were positive or negative (Wills et al., 1992). One study also evaluated the qualities of life events using external experts (Tate et al., 2006) who may not have correctly placed the life events in the positive or negative category for those individuals. One could argue that specific items and life events are not always relevant for individuals and that this could have biased previous findings. Perhaps the solution is to let the patients define significant life events and decide whether these events had positive or negative impact on their life situation. The patients, with specific knowledge of their context, may have more insight into the life event impact than external counterparts or predefined quantitative weighting instruments.

A potential shortcoming in the cited literature is that the studies have not focused on gender differences in the relation between life events and substance use. Psychological research has found that males often cope with significant negative life events with behavioural action (Aneshensel et al., 1991). According to Taylor et al. (2000), males often react to major stressors with a fight-or-flight response. The researchers noted that females more often react to negative significant life events with seeking out social support, in particular from female peers, which is known as a tend-and-befriend response. In addition, females are likely to react to stressors by protecting their offspring from danger, while males often respond to stressors with behavioural countermeasures. When substance use has developed

into a core component of the coping apparatus, such use could operate as instrumental behaviour for withdrawal from a stressor. Hence, the present thesis also focused on gender differences in the tested model where significant life events were hypothesised to predict substance use.

1.2.3.2. Psychosocial distress

Substance use may not only relate to recent significant life events, but also to experiences of psychosocial distress. For the purpose of the present study, psychosocial distress was operationally defined as two constructs: (1) psychological distress, such as symptoms of depression and anxiety, and (2) interpersonal problems, such as problems initiating social interaction and participating in groups (Derogatis, 1983; Pedersen, 2002).

There is a high prevalence of symptom load related to co-occurring psychiatric disorders among patients with substance use disorders. Landheim et al. (2002) found that 91% of a sample of patients with substance addiction in Norway had been diagnosed with additional psychiatric disorders during their lifetime. About 63% of this sample met the criteria of three or more psychiatric diagnoses. Generally, both national and international studies have demonstrated that depression and anxiety are the more common co-occurring mental disorders among patients with substance addiction (Grant et al., 2004; Landheim et al., 2002). It should be pointed out, however, that psychological distress is not equivalent to psychiatric disorders as, for example, operationalised by the DSM-IV-TR manual. Psychological distress is an indication of the degree of uncomfortable experiences related to psychopathology (Pedersen & Karterud, 2004). Hence, psychological distress could be a proxy to psychiatric disorders.

The assumption that psychological distress relates to the course and development of substance addiction has received empirical support. Psychological distress could significantly worsen recovery prognosis from substance use disorders (Teesson & Proudfoot, 2003). Such distress could increase the probability of relapse and premature dropout from treatment services (Marlatt & Gordon, 1980; Mueser et al., 1998). The connection between psychological distress and substance use was also illustrated in a study where patients with co-occurring substance addiction and psychological distress were more likely to manifest severe levels of substance use (Grella et al., 2001). These patients also reported more problems related to social networks and were more likely to be involved in criminal activity than patients with lower psychological distress. Notwithstanding that both these patient groups had significant reductions in substance use and

criminal behaviour 12 months after treatment, post-treatment results showed better outcomes among patients without co-occurring distress.

Several explanatory models have been formulated to describe the relations between psychological distress and substance use. The self-medication hypothesis (Duncan, 1974; Khantzian et al., 1974) entails that people use substances in order to relieve uncomfortable emotional states. An important presumption in the version by Khantzian et al. (1974) was that specific substances are used to medicate specific psychological symptoms. The empirical evidence for this version of the theory has been equivocal. Congruent with the hypothesis, a study found that patients with heroin and alcohol addiction reported that these substances reduced their symptom load (Castaneda et al., 1989; see also Cornelius et al., 2003). Yet, a comprehensive review that examined several studies as to whether alcohol was used to reduce symptoms of social phobia concluded that reduction of social phobia was one of the reasons for alcohol use (Carrigan & Randall, 2003). However, the authors also pointed out that alcohol increased anxiety and other domains of psychological distress in the long term. Despite negative effects over time, the individuals continued to use alcohol. If a reduction of symptom load was the core incentive for alcohol consumption, the consumption should be significantly reduced or stopped entirely when it facilitates psychological symptoms. Duncan (1974) proposed that maladaptive substance use is maintained through negative reinforcement. Individuals who have developed an addiction may use substances to escape from an adverse stimulus such as mental distress. From this perspective the likelihood of operant behaviours (e.g. alcohol consumption) will increase as long as the behaviour temporarily removes or reduces the adverse emotional state. This may be especially true when the increased psychological symptom load is recognised solely by the individual when alcohol consumption is temporarily stopped.

Mueser et al. (1998) reviewed different models that explain the relation between psychological symptoms (i.e. schizophrenia and bipolar disorders) and substance use. The authors concluded that there was limited support for the assumption that patients use specific substances in order to self-medicate certain symptoms. The relation between psychological symptoms and substance use is more likely bidirectional. Bidirectional models argue that substance use could induce psychiatric symptoms among patients with higher diathesis and vice versa (Biafora Jr et al., 1994; Castellani et al., 1997; Strandheim et al., 2007). Mercier et al. (1992) postulated that high severity levels of substance use could have negative influences on psychological functioning, but psychological distress could also be the underlying cause of excessive substance use. The present thesis did not

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specifically aim to determine the validity of different causal models for substance use as this requires longitudinal studies with extensive follow-up. However, these models served as theoretical basis for the empirical work in papers II and III. It should also be noted that the etiology of the relation between psychological distress and substance use may not always be relevant from a clinical perspective. Both patients with substance induced psychological symptoms and psychologically induced substance use could benefit from integrated treatment services for both disorders.

Few Norwegian studies have examined how different consumption levels of substance use relate to differences in psychological distress and interpersonal problems. One study showed that patients who reported high severity levels of substance use experienced more psychological distress (Landheim et al., 2006). A study related to this topic was also carried out among patients in psychiatric health care (Møller & Linaker, 2006). The results showed no differences in psychosocial functioning between patients with high and low levels of substance consumption. Landheim et al. (2006) applied general index scores of symptom load, which made information about specific symptoms related to consumption unavailable. In addition, the study did not differentiate between alcohol and illegal substances. Differences across these substance types are probable because patients who have developed an addiction for illegal substances might be more stigmatised than patients who are addicted to legal substances (Substance Abuse and Mental Health Services Administration, 2008). Stigmatisation, because of illicit substance use, can reduce social resources and support available to these patients. Therefore, variables such as education, housing, employment, economic income and treatment history were taken into account when differences in psychosocial functioning according to consumption level of substances were examined in the present thesis.

Individual capability to participate in social interaction may relate to both psychological distress and substance use. To the author's knowledge, few studies have investigated such relations among patients with substance addiction. Snyder and Whisman (2007) suggested that interpersonal problems are associated with psychological distress. Dobkin et al. (2002) found higher levels of psychological distress among patients who had less social support. These patients were also more prone to using excessive amounts of substances. A likely explanation is that reduced capabilities to take part in conventional social interaction (i.e. interpersonal problems) may reduce the social network of and support received by these individuals. This could in turn increase substance use, which could further facilitate interpersonal conflict. Mueser et al. (1998) reasoned that substance use

could be maintained by reduced social competence, social isolation and maladaptive social networks.

A recent study supported the idea that interpersonal problems and substance use are related (Mueller et al., 2009). The study compared interpersonal problems among patients with alcohol addiction and a control group of health professionals. Patients with alcohol addiction reported more interpersonal problems than the controls. The findings also showed that females reported higher levels of interpersonal problems than males. This indicates that studies that examine relations between psychological constructs and substance use should carry out sub-group analysis among different demographic groups.

Psychosocial distress could increase the probability of substance use among patients with substance use disorders. Consequently, research should focus on psychosocial distress among patients with substance use disorders. In addition, the field could benefit from more knowledge about how psychosocial distress relates to other psychological variables, such as coping cognitions and significant life events, in this patient group. Potential gender differences in these relations are also an important aspect to investigate. Improved understanding of how these concepts relate to substance use could increase our possibility to influence substance use through changing patients' cognitive, emotional and behavioural reactions to significant life stress, interpersonal problems and psychological distress. If there are gender differences in these associations, different clinical countermeasures may be used to reduce substance consumption in the specific groups. Therefore, one of the core aims of the present thesis was to test a model where positive and negative life events, psychosocial distress and coping cognitions predicted substance use. Gender differences in this model were also investigated. Another aspect of interest for the present thesis was to investigate if patients with high and patients with low substance consumption level experienced different symptom loads on dimensions of psychosocial distress. Contextual variables, such as housing, occupation and income were taken into account.

1.2.3.3. Self-efficacy

Thus far, it has been argued that significant life events, psychological distress and interpersonal problems may predict substance use among patients with substance use disorders. Newcomb and Harlow (1986) asserted that perceived control could be an influential factor associated with how individuals interpret significant life events. Significant life events may not be distressing or non-distressing by definition. The characteristics and impact of such events are determined by how they are perceived and experienced. Thus, individual coping cognitions could

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moderate the relations between significant life events, psychosocial distress and substance use. If an individual perceives life events and psychosocial distress as uncontrollable, the person could be more likely to use substances when confronted with stressors. Ultimately, an individual may continuously experience lapses and relapses when confronted by stressful life events and psychosocial distress due to learned helplessness (Seligman & Maier, 1967). Conversely, the patients may be more likely to resist substance use in risky situations if they believe that they have sufficient resources to cope with stress by other means than substance consumption. A relevant concept in this line of argumentation is self-efficacy. This concept is defined as individuals' belief that they can successfully perform the behaviours required to obtain specific outcomes and goals (Bandura, 1977). From this social cognitive perspective, self-efficacy could be considered as cognitions related to the level of confidence the individuals have in relation to their coping mechanisms. Bandura (1982) argued that self-efficacy is the cognitive component of perceived control.

Self-efficacy is most likely relevant in the relations between significant life events, psychosocial distress and substance use because cognitive coping beliefs influence how patients react to major life events and psychosocial distress. Segrin (2001) demonstrated that self-efficacy was a moderator of interpersonal distress. In addition, self-efficacy influenced individual capabilities to control substance consumption. This implies that patients who manifest excessive substance use might have a lower level of self-efficacy than people who successfully abstain from substances. This may be a result of lower confidence in personal coping resources when exposed to situations where the risk of substance use increases. There are several studies that support this assumption (Marlatt & Gordon, 1985; Rounds-Bryant et al., 1997; Sklar et al., 1999). Oei et al. (2007) showed that global non-specific self-efficacy predicted substance use in a sample of patients with alcohol addiction. However, the study found no significant association between drinking refusal self-efficacy and alcohol consumption. In the light of the cited studies, self-efficacy was considered a potential mediator of the associations between life events, psychosocial distress and substance use. Consequently, this psychological variable was included in the model where these relations were tested in the present thesis.

1.2.4. Perceptions of treatment and recovery processes among service users

The previous sections discussed contextual and psychosocial factors with potential importance for relapse and contemporary substance use among patients with

substance use disorders. Psychosocial and contextual variables may also be relevant for how patients perceive the quality of their treatment and recovery processes. Therefore, it was also of interest to investigate contextual and psychosocial factors of potential importance for perceptions of treatment and recovery processes among patients with substance use disorders. Treatment processes were broadly defined as processes that are usually part of clinical treatment. These processes could relate to factors present both in and outside treatment facilities such as specific treatment therapies, level of user influence, aftercare services and work environment and communication flow at the clinical facilities (Bacchus et al., 1999). Recovery processes refer to personal changes in, for instance, goals, attitudes, emotions and general functioning. An individual in recovery could restore direction, meaning and purpose in life without being dominated by the negative influences of the disorder (Anthony, 1993).

The evidence-based paradigm continues to have a significant influence on the Norwegian health care system (Gullestad, 2003; Ravndal, 2007). An important precondition of this paradigm is that therapeutic techniques and methods with empirically documented effects should be facilitated and prioritised in clinical practice (Davidson et al., 2003; Sackett, 1997). A paradox, however, is that randomised controlled studies (RCTs) carried out in the United States and the United Kingdom show markedly similar patient outcomes across psychosocial treatment approaches for substance use disorders (Project MATCH Research Group, 1993; UKATT Research Team, 2005a, 2005b). These studies have demonstrated that patients improved significantly on important substance use and psychological outcomes during the course of treatment. Notwithstanding differences in treatment methodologies and traditions, however, the outcomes did not vary significantly across the programmes. In Project MATCH most of the variance in patient outcomes was explained by the relationship between the patients and therapists (i.e. the therapeutic alliance). Similar findings have been reported in psychiatric health care (Asay & Lambert, 1999) and other studies carried out among patients with substance use disorders (De Weert-Van Oene et al., 2001). A consequence is that additional factors to the specific treatment methodologies and programmes need to be investigated in order to obtain knowledge about how the service users experience their treatment and recovery.

Treatment of substance use disorders does not occur in an enclosed environment where the individuals are influenced solely by therapeutic interventions. A number of contextual and psychosocial factors, both in and outside the treatment context, are likely to influence how patients perceive processes related to treatment and recovery (Ravndal, 2007). Accordingly, semi-structured

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interviews carried out among patients with substance use disorders have shown that psychosocial and contextual factors, which are relatively common across specific therapeutic traditions and programmes, relate to patients' perceptions of treatment processes (e.g. Bacchus et al., 1999; Lovejoy et al., 1995). According to the informants in these studies, some of the more important variables for perceptions of treatment processes were the social relations between treatment personnel and patients at the facilities. In addition, the patients perceived consistent and fair practice of facility regulations as important contributors to the quality of treatment. These findings can be considered in light of the concept that Asay and Lambert (1999) refer to as Common Factors in Therapy. These factors relate to variables such as therapeutic relationships and treatment expectations, which are not specific to a particular therapeutic tradition. The authors argued that common psychosocial and contextual factors explain about 85% of treatment outcomes, whereas about 15% are explained by specific interventional techniques.

In regard to recovery processes, a study found that the establishment of adaptive coping strategies for life events was one of the more important domains of recovery reported by patients (Connors & Franklin, 2000). Specifically, the patients focused on learning alternative coping strategies to substance use when faced with such events. These individuals also stressed that a respectful, understanding and non-confrontational approach from their therapists was important for the perceived quality of treatment processes. Furthermore, it was underscored that patients at the clinics had mutual influence on each others' treatment motivation. The results reported by Bacchus et al. (1999) also underlined the relevance of interpersonal relationships between patients at the treatment facilities. For instance, patients who had been enrolled in treatment for a longer period reported deriving satisfaction from tutoring recently enrolled patients. Several scholars have also stated that variables related to the social ward atmosphere (e.g. the work environment and communication flow between treatment staff and patients) are associated with patients' perceptions of treatment processes (Finney & Moos, 1984; Jørgensen et al., 2009).

Reductions in substance use and improvements in psychological health are two of the more common outcome measures applied in studies among patients with substance addiction (Carroll et al., 1993; Grella & Stein, 2006). These factors are indeed relevant components of patient recovery. However, it might be an oversimplification to merely focus on these aspects of functioning. McIntosh and McKeganey (2000) found that the patients also strived to establish new social networks and focused on improvements in their social functioning after treatment. Orford et al. (2009) carried out semi-structured interviews and found that

significant others influenced changes in substance use and overall psychological functioning. A general shortcoming of RCT studies is that these investigations often demonstrate differences in patient outcomes without providing sufficient explanations for why and for whom different treatment outcomes occur (Gossop, 2002). In-depth semi-structured interview studies that investigate psychosocial and contextual factors relevant to treatment and recovery processes may shed light on additional explanatory factors for patient recovery that are not often revealed by studies with a quantitative methodology.

Previous studies that examined psychosocial and contextual factors relevant to treatment and recovery processes using semi-structured interviews had methodological sampling issues. Lovejoy et al. (1995) only included male patients who completed cocaine addiction treatment programme. The exclusion of those who did not complete treatment might skew results because patients who complete treatment could be more likely to report satisfaction with their treatment and recovery processes. A premature dropout from a treatment programme could be an indirect way of expressing negative reactions towards treatment processes and progress towards recovery (Brown & Wood, 2001). Therefore, research validity and ethical issues call for the inclusion of patients with premature programme dropout in these studies. Their opinions and experiences could reveal areas in need of improvement.

The cited studies show growing empirical support for relatively similar treatment outcomes across different treatment modalities. Research also advocates that potential recovery domains are complex among patients who manifest substance use disorders. In spite of this, decision makers tend to invest the majority of resources in studies aimed to demonstrate differences within a strictly limited number of outcome domains across different programme modalities (Ravndal, 2007). Indeed, studies that compare outcomes of different clinical interventions could yield feasible results. This is more likely to be true when strictly manualised treatment approaches are examined (Gullestad, 2003). These approaches are more likely to have high treatment fidelity, which in turn may increase the potential of ruling out alternative explanations. Meanwhile, it could promote misconceptions if outcome studies are applied without an in-depth consideration of the research questions (Gossop, 2002; Ravndal, 2007). Psychosocial and contextual factors related to treatment and recovery processes may ultimately serve as proxies for whether treatment is successfully adjusted to the specific problem domains of the patients (McLellan & Hunkeler, 1998). Perceptions of such factors are likely to vary substantially between individuals. The individual variation of psychosocial and contextual factors that are important for perceptions of treatment and recovery

could be ascertained through semi-structured interviews. Unfortunately, adequate Norwegian measurement instruments for these perceptions have yet to be established (Danielsen & Garratt, 2007). Therefore, alternative methods to quantitative questionnaires should be considered when a study aims to investigate which psychosocial and contextual factors are important for patients' treatment and recovery processes.

Consequently, several studies support investigation of contextual and psychosocial factors with importance for perceptions of treatment and recovery processes using methodology based on semi-structured interviews to yield information more specific to the individuals and more useful in clinical practice than traditional outcome studies. Hagen (2009) argued that processes detected at the group level in traditional outcome studies are not always relevant for the specific individuals. From this ontological perspective, perceptions of treatment and recovery processes are not necessarily possible to generalise to a vast numbers of patients (see also Gullestad, 2003). McLellan and Hunkeler (1998) also argued that traditional outcome evaluations of treatment tend to be time consuming and expensive. The researchers suggested investigations of user perceptions and satisfaction as alternative indicators of treatment performance. These examinations are usually less resource demanding in terms of data collection and analysis. The final aim of the present thesis was to explore psychosocial and contextual factors of importance for how patients perceived their treatment and recovery processes.

1.3. Specific aims of the thesis

As argued in the previous section, psychosocial and contextual variables may be relevant for relapse, substance use and perceptions of treatment and recovery processes among patients who manifest substance addiction. The core aim was subdivided into more specific sub aims because of its extensive scope.

An indicator of patient outcomes could be the time interval which proceeds after treatment discharge to a relapse (Myers et al., 1993). One of the main aims of treatment for substance use disorders is to develop patients' coping strategies to a level where they can cope with life without being dominated by substance addiction. And though relapse is undesirable, researchers have shown that relapse after treatment is common for patients with substance use disorders (e.g. Hunt et al., 1971; O'Brien & McLellan, 1996). Previous studies have mainly focused on co-occurring disorders and treatment interventions as predictors for relapse (e.g. Nace et al., 1986; Schadé et al., 2005; Tohen et al., 1990). These variables are important for relapse risk, but studies that also take demographic characteristics and contextual variables into account could yield valuable information. Factors that

relate to a prolonged period from treatment discharge to a relapse could be regarded as protective factors, whereas variables related to a reduced time interval from treatment discharge to a relapse could be considered risk factors for relapse. The investigation of these factors in further detail was the basis of the aims of paper I:

- Examine the time after treatment discharge to a potential relapse occurrence among the respondents;
- Explore contextual and psychosocial factors that prolonged or reduced the time interval from treatment discharge to potential relapse. These factors included demographic characteristics (e.g. gender, age-groups and housing situation), psychiatric diagnoses (e.g. depression and anxiety), substance use characteristics (e.g. age of onset of substance use, main substances used) and treatment background (e.g. types of previously attended programmes, total number of weeks in treatment).

In line with previous findings, it was hypothesised that the relapse risk would be high in the early months after treatment (Gossop et al., 2002; Hunt et al., 1971; Xie et al., 2005). It was also assumed that younger patients would experience a shorter time interval from treatment discharge to relapse than older patients (Oslin et al., 2002). Patients with full time employment were assumed to have a lower relapse risk compared to patients who were unemployed (Al-Nahedh, 1999; Xie et al., 2005). Furthermore, male patients were hypothesised to have a higher relapse risk than female patients (Xie et al., 2005). Indicators of social support, such as having a co-living partner and children, were expected to be protective factors for relapse (Cornelius et al., 2003; Hammerbacher & Lyvers, 2006). Individuals with psychiatric diagnoses were hypothesised to have higher relapse risk than patients without co-occurring psychiatric disorders (Domino et al., 2005; Nace et al., 1986; Tohen et al., 1990). It was assumed that patients who had attended several different treatment programmes would have higher relapse risk compared to patients who had not because a high number of attended programmes could reflect higher severity level of substance use disorders. Previous research has revealed contradictory findings regarding the role of specific substances for relapse rates (Ciesla et al., 2008; Domino et al., 2005; Hunt et al., 1971). Consequently, no hypothesis was asserted regarding the role of specific substances for relapse.

Significant life events may have implications for substance use. It is also probable that some life events occur independently of treatment interventions and may interact with the interventions in influencing the improvement processes of patients. Previous studies have tended to focus on how negative life events relate to

substance use (Biafora Jr et al., 1994; Taylor, 2006; Wills et al., 1992). However, positive life events could have stress buffering effects and thereby reduce substance use among patients. Few studies incorporated and tested models regarding how positive and negative life events relate to psychosocial functioning and self-efficacy among patients with substance use disorders. Studies that tested such models by gender also remain scant. To address some of the gaps in the literature, the specific aims of paper II were to:

- Test a model where significant positive and negative life events, psychological distress, interpersonal problems and self-efficacy predicted substance use;
- Examine whether this model varied by gender.

Based on previous research, it was hypothesised that accumulated negative life events would predict increased substance use among the patients (Aneshensel & Huba, 1984; Scheier et al., 1999; Wills et al., 1992). Positive life events were expected to be associated with reduction in substance use (Saunders & Kershaw, 2006; Scheier et al., 1999). Increased psychological distress was hypothesised to have a direct relation to increased substance use (Duncan, 1974; Grella et al., 2001; Khantzian et al., 1974), whereas interpersonal problems were expected to have an indirect relation to increased substance use because such problems could facilitate psychological distress (Dobkin et al., 2002; Snyder & Whisman, 2007). Psychological distress was assumed to predict reduced self-efficacy. Self-efficacy was hypothesised to predict reduction in self-reported substance use (Segrin, 2001; Sklar et al., 1999). The direct relation between life events and substance use was hypothesised to be stronger among males because they may be more prone to react to life stressors with behavioural action (Taylor et al., 2000). The relation between interpersonal problems and psychological distress was expected to be stronger among females (Mueller et al., 2009).

A possibility is that patients differ in specific domains of psychosocial distress according to their consumption level of illicit substances or alcohol. The majority of Norwegian studies aimed to investigate differences in psychosocial distress according to levels of substance use have been carried out in general psychiatric health care (e.g. Møller & Linaker, 2006). The studies conducted among patients with substance use disorders have usually applied general index scores of psychological constructs, which do not yield information about the specific problem domains where these differences may occur. Furthermore, these studies did not carry out separate analysis for legal and illegal substances and did not focus on interpersonal problems (e.g. Landheim et al., 2006). In order to partially fill this gap, the aim of paper III was to:

- Examine differences in psychosocial distress related to high or low consumption of illicit substances or alcohol.

Based on findings in previous work (Landheim et al., 2006; Møller & Linaker, 2006), it was hypothesised that patients with high levels of illicit substance or alcohol use would report more psychological distress than patients with lower consumption of these substances. More interpersonal distress was also expected among patients with high consumption levels of substances (Dobkin et al., 2002; Mueller et al., 2009). Because patients who manifest high consumption levels of alcohol may be less stigmatised than patients who primarily manifest high levels of illicit substances (Substance Abuse and Mental Health Services Administration, 2008), it was expected that the differences in psychosocial distress would be stronger for those who use illicit substances than those who use alcohol.

Despite that user evaluations are considered to be quality indicators of treatment services (Finney & Moos, 1984; Jones et al., 1994), surprisingly few studies have investigated psychosocial and contextual factors of potential importance for how patients perceive their treatment and recovery processes. Previous studies that have investigated these perceptions by semi-structured interviews tended to solely recruit patients who completed their treatment programme. Gender distribution was also skewed in these studies (e.g. Lovejoy et al., 1995). Information about factors related to treatment and recovery processes may yield knowledge about improvement potentials in treatment for substance use disorders. In addition, such studies could point out clinical approaches that the patients consider useful, and these approaches could thereafter be reinforced in practice. Furthermore, there are currently no validated Norwegian questionnaires for perceptions of treatment and recovery processes among patients who manifest substance use disorders (Danielsen & Garratt, 2007). A methodological approach based on semi-structured interviews may reveal contextual and psychosocial factors that should be included in a measurement instrument. Hence, the aim of paper IV was to:

- Investigate psychosocial and contextual factors of potential importance for positive and negative perceptions of treatment and recovery processes among the patients.

In accordance with previous research (Asay & Lambert, 1999), it was hypothesised that the patients would focus on common contextual and psychosocial factors across the different treatment programmes such as the quality of the social relationships established in the clinics (Bacchus et al., 1999; Lovejoy et al., 1995).

It was also hypothesised that the patients would put emphasis on psychological functioning, substance use, social networks and occupational activities when they expressed their opinions of which factors had relevance for their recovery processes (McIntosh & McKeganey, 2000; Orford et al., 2009).

In line with the community psychological approach of the present thesis, it was also of interest to examine subsample differences in demographics, material resources, substance use characteristics and treatment background variables. Such analysis can yield additional information about differences in resources and challenges experienced by sub-groups of patients. In paper I, such differences were examined between patients who had experienced a relapse after their initial treatment and patients who had not experienced relapse. Subsample differences were also studied between patients who manifested high and low consumption levels of illicit substances or alcohol (paper III).

2. Method

2.1. Sampling and procedure

The results of the present thesis were based on two different samples. The findings reported in papers I, II and III were obtained by a cross-sectional questionnaire survey conducted in a patient sample established from 16 treatment clinics for substance use disorders in Norway. The results reported in paper IV were based on semi-structured interviews among a purposeful strategic sample of patients with substance use disorders. These patients were recruited from six treatment facilities in the central region of Norway.

2.1.1 Cross-sectional sample

During March 2008 and August 2009 patients at 16 Norwegian treatment clinics for substance use disorders were approached and recruited by appointed research coordinators at each clinic. These units consisted of 12 inpatient and three outpatient facilities. One facility included OMT. Nine of the facilities were spread throughout the central region of Norway (i.e. Sør-Trøndelag, Nord-Trøndelag and Møre-Romsdal) and seven of the facilities were in the urban south eastern part of Norway (i.e. Oslo). Specialised treatment for substance use disorders were differentiated into four levels in Norway at the time of data collection. These four levels were: (1) outpatient treatment, (2) short-term inpatient treatment lasting less than six months, (3) long-term inpatient treatment lasting more than six months and (4) outpatient medically assisted rehabilitation (Norwegian Ministry of Health and

Care Services, 2008). The present sample included patients from all four treatment levels.

Applications were distributed to the Regional Committee for Medical Research Ethics in Central Norway and the Norwegian Social Science Data Services before patients were recruited, and the study received approval from both. Compliant with Norwegian ethical requirements, patients received both oral and written information about the study. The research coordinators explained the purposes of the study and informed the patients that the responses would be analysed anonymously. The patients were also orally informed that participation was voluntary. Patients who were interested in participation were asked to read a consent letter. The letter explained in further detail that participation was voluntary and described the applied methods that would be used to secure the confidentiality of respondents. This letter also clearly stated that the respondents could have their responses deleted during the study. Completion of the questionnaire served as a full consent for participation. Incentives for participation were two lottery tickets for prizes worth about € 580 each.

A cross-sectional convenience sampling procedure was carried out. Patients were approached and recruited by research coordinators during the first two months ($n = 139$) or during the last two months of treatment ($n = 83$). This methodological approach was chosen because the majority of coordinators were responsible for enrolling and discharging patients. Consequently, the patients were more available to the coordinators during these stages of treatment. In addition, potential respondents were more available for research and less occupied with clinical activities during these phases of treatment. Patients who received detoxification without any further treatment, patients under 18 years of age and patients who were unstable to an extent that they were incapable of giving informed consent were excluded from the study. The response rate for this part of the data collection was 53% ($n = 222$).

Patients located outside of the controlled treatment context were included to gain a representative sample. Therefore, persons on the treatment waiting lists ($n = 63$) and patients who had completed their treatment during the last 3 to 12 months ($n = 67$) were recruited to the study. Mailed questionnaires with a similar cover letter to the one distributed to patients at the facilities were sent to patients' households by the coordinators. One reminder letter was sent to non-respondents three weeks later. The response rate for this part of the survey was 28% ($n = 130$). The final sample included a total of 352 patients.

The age of the respondents ranged from 18 to 77 years ($M = 37.77$, $SD = 11.98$). The gender distribution was 70% male and 30% female. The majority of

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the sample had high school as their highest completed education (48%). However, 37% and 13% reported primary/secondary school or university/college as their highest completed education, respectively. About 2% of the sample had not completed primary/secondary school. Most of the patients were unemployed (56%), though 21% had full time employment about 10% had part-time employment and 13% were students. Social benefit was the more common source of patient income (78%). Only 10% of the sample had work-related salary as their major income, whereas 12% reported that they had multiple sources of income. A total of 76% reported that they had a live-in-partner and 53% of the patients were parents. About 63% of the sample lived in private housing, whereas 32% lived in housing owned by others and 5% reported that they had no housing.

The more common co-occurring psychiatric disorders were depression (45%) and anxiety (39%). Patients also reported attention deficit hyperactivity disorders (ADHD) (14%), personality disorders (10%), post-traumatic stress disorders (PTSD) (10%), eating disorders (5%), obsessive-compulsive disorders (2%) and schizophrenia (2%). A total of 41% used alcohol as their major substance. About 24% used opioids, 21% used stimulants, 9% used cannabis and 5% used other substances (e.g. psychopharmaca, ecstasy). It is important to point out that 60% of the sample used several substances simultaneously (i.e. poly-substance use). The patients had been to treatment for an average of 63.15 weeks ($SD = 124.89$). The majority of individuals (45%) were recruited by facilities that conducted long-term inpatient treatment; 31% were recruited by short-term inpatient treatment facilities, 12% attended OMT and 12% were recruited by open-ended outpatient treatment facilities.

The representativity of the sample for the Norwegian population of patients who manifest substance use disorders was investigated by comparisons with a substantial sample of the target population (Iversen et al., 2008). The data collection from the population was carried out on a yearly basis since 1997. The comparisons were carried out with data from 2007 ($N = 37\,197$), and included patient characteristics from 113 treatment facilities for substance use disorders across Norway. Data from the population sample are aggregated in a national database. The data comprise comprehensive information about demographic characteristics, variables related to substance use and psychological functioning and treatment background variables. The comparisons showed that there were slight differences between the present sample and the population sample in demographics, substance use characteristics and psychosocial functioning (see also paper I). The patients in the present sample were somewhat more likely to use stimulants (21% vs. 9%) and more likely to receive social benefit as their major

income source (78% vs. 57%). The patients in the present sample were also less likely to be unemployed (56% vs. 75%) and more likely to have mood disorders (45% vs. 34%) or anxiety disorders (39% vs. 32%). It is important to note that some indicators were either unavailable or measured differently in the population sample. Therefore, it was not possible to carry out sample comparisons for all central characteristics in the samples. In spite of this, the characteristics of the present sample mainly resemble those in other similar studies in Norway (Landheim et al., 2003; Melberg et al., 2003). Consequently, the representativity of the present sample for Norwegian patients who manifest substance use disorders was considered satisfactory.

2.1.2 Strategic sample

The sampling strategy for the study based on semi-structured interviews was pragmatically adjusted to the research topic and data analysis (Marshall, 1996). This sample was established from June to October 2008. Our goal was to recruit one patient who had completed treatment during the last two months and one patient who had dropped out of treatment during the last six months from each facility. These patients were obtained from five inpatient facilities and one OMT programme in Sør-Trøndelag and Møre and Romsdal counties in central Norway. We attempted to include both patients who had voluntarily left the programme and facilities and patients who had been dismissed because of violations of facility regulations. Patients who had prematurely left their programme were difficult to reach. Therefore, some of these patients were recruited from other facilities than the one from which they had prematurely dropped out. In these cases, retrospective interviewing was conducted related to the treatment programme they had prematurely left. Inclusion criteria were that the patients were over 18 years of age and that they had been enrolled in the treatment programme in question for more than three weeks. We did not require that the patients were abstinent during the interviews, only that they were sufficiently stable before the interviews were carried out. The distribution of demographic characteristics, such as informants' level of education and gender, were carefully monitored and balanced throughout the recruiting process.

The patients were recruited by appointed research coordinators at each clinic. The coordinators purposefully selected patients from patient lists and either contacted them by phone or approached them at the clinics. Coordinators were instructed to recruit informants who were likely to have substantial experiences and capabilities so that they could reflect on the research topic. First, the patients were orally informed about the study. Individuals who wanted to participate were asked

to read a consent letter. This letter described the purposes of the study in further detail. The information in the letter also included how the interviews would be carried out and explained the applied methods that secure the confidentiality of the informants. The consent letter also clearly stated that participation in the study was voluntary. Patients who participated signed and returned the letter. This procedure was formally accepted by the ethical authorities before patient recruiting was initiated. Fourteen patients were asked to participate in the interviews and 13 patients consented (a response rate of about 93%).

The age of the patients ranged from 22 to 47 years ($M = 31.38$, $SD = 8.87$). Six patients were male and seven were female. Five patients had primary/secondary school as their highest completed education, six patients had completed high school and two patients had a university or college education. Six patients were unemployed, four patients had full time employment, one patient had part-time employment and two patients were full time students. Three patients solely used alcohol and two patients used opioids as their main substances. Eight of the interviewed patients used more than one substance. The sample consisted of a fairly equal distribution of patients who had completed ($n = 7$) and prematurely left their treatment programme ($n = 6$). Four patients had received treatment in short-term inpatient treatment programmes and two patients had attended open-ended outpatient OMT. In addition, three patients had been enrolled in a therapeutic community and four patients had attended long-term inpatient treatment.

Among the patients who completed their programme, three were at the end of active treatment that lasted for approximately ten months, four had completed their programme and left the facilities and two had prematurely left their programme and attended other inpatient treatment programmes when the interviews were conducted. These programmes had lasted on average one and a half months for the latter group of patients. Furthermore, two of the patients who had prematurely dropped out of treatment participated in psychiatric outpatient treatment for approximately two months when the interviews were carried out. Two research assistants, who were recruited among master students in psychology and sociology, performed the semi-structured interviews. They were chosen because they have experience in qualitative methodology and clinical practice among patients with substance use disorders. Both assistants signed a confidentiality form before they became active in the study. An interview guide was developed in collaboration with the research assistants; the content of which is described below (see section 2.2.2.). Thereafter, the assistants were trained in interview techniques and a total of two pilot interviews were conducted among inpatients before the data collection

was initiated. The interview guide was adjusted according to the feedback received in the pilot interviews.

The assistants were instructed to be active in the interview situation in that they should ask for specific examples when patients' responses were incomplete. When patients, for instance, answered 'yes' or 'no' to questions that could provoke more reflection, the interviewers asked follow-up questions. During the interviews, the assistants tried to get balanced responses from the patients by, for example, asking about negative experiences when patients' responses seemed only to represent their positive treatment experiences.

The interviewers were also encouraged to allow the patients to speak freely when interesting topics and cues were brought up by the patients to minimise interruptions of patient reflections. The informants were interviewed individually in a private room at the treatment facilities. The interviews were completed within one to two hours and were recorded with a digital sound recorder. Speech-to-text transcriptions were carried out by the author of the present thesis and the two research assistants.

2.2. Measurement instruments

2.2.1. Questionnaire

A comprehensive questionnaire was developed in cooperation with a research group that consisted of clinicians, researchers and patients enrolled in substance addiction treatment (papers I, II and III). The questionnaire included validated instruments of substance use, psychological distress, interpersonal problems and self-efficacy. A section comprising demographic characteristics, information about relapse to substance use and significant positive and negative life events was also included in the questionnaire.

The Drug Abuse Screening Test-20 (DAST-20) (Skinner, 1982) consists of 20 dichotomous items that record substance use during the last month. The instrument excludes alcohol use and intake of prescription medications. The patients responded to items about the frequency of abstinent periods, loss of occupational activity and conflict in their social network caused by their substance use. The index score that can be calculated from the responses on the DAST-20 indicates the overall severity level of substance use. The cut-off score is six and above and indicates high severity level of substance use. The index score was used as a continuous variable in paper II, whereas categorical cut-off scores were included in paper III. The instrument has been widely tested and found to have good

psychometric properties in the context of general psychiatric health care (Cocco & Carey, 1998) and substance addiction treatment (Gavin et al., 1989; Skinner, 1982).

The Alcohol Use Disorder Test (AUDIT) (Saunders et al., 1993) was included to measure the severity level of alcohol use during the last month. This instrument comprises 10 dichotomous test items that address the frequency and amount of alcohol consumption and the patients' capability to maintain their social and occupational obligations. The reliability and validity of the AUDIT has been established (e.g. Allen et al., 1997). The total index score of the AUDIT reflects the overall severity level of alcohol consumption and ranges from 0 to 40 with a cut-off value of eight or above indicating problematic drinking behaviours. The index score was calculated and included as a continuous variable in paper II and categorical cut-off scores were applied in paper III.

Psychological distress was screened using the Symptom Checklist-90-Revised (SCL-90-R) (Derogatis, 1983). The patients reported how often they had experienced symptoms such as hallucinations, suicidal thoughts and uncontrolled rage during the last seven days. This measure was scored by patients on a five-point Likert scale ranging from (1) not at all to (5) very much. The SCL-90-R consists of 90 items segmented into ten different dimensions of symptom load. Detailed descriptions of dimensionality and content of specific dimensions are given in paper III. A general severity index (GSI) can be calculated to establish an overall indicator of symptom load. A GSI score above 1.75 indicates that the patient is approaching a similar symptom load as patients with anxiety and mood disorders in general psychiatric health care (Derogatis, 1974). Paper II used the GSI score to avoid overly complicated analysis. Paper III included the specific dimensions of the instrument in statistical analysis.

The Inventory of Interpersonal Problems – Circumplex (IIP-C) (Pedersen, 2002) was used to collect information about current interpersonal problems. The Norwegian version of the IIP-C is a 48-item modification of the original 64 item version (Alden et al., 1990). This instrument was scored on a five-point Likert scale ranging from (1) not at all to (5) very much. The instrument consists of two sections. In the first section the respondents judged the difficulty of 27 social behaviours. The second section contains 21 items related to socialisation. The patients were, for example, asked how often they experienced participation in groups or being introduced to new people as problematic. They were also asked about the tendency to manipulate people or demand excessive amounts of attention during social interaction. The test items are segmented into nine dimensions and the content and internal consistency are described in further detail in paper III. An index score can be calculated for the IIP-C and indicates the overall level of

interpersonal problems. The index score was used as a continuous variable in paper II, whereas the specific dimensions of the instrument were applied in paper III. Studies that have used the IIP-C have demonstrated that the instrument correlated with observer-rated personality disorders (Pedersen, 2002).

The General Perceived Self-Efficacy Scale (GSE) (Schwarzer & Jerusalem, 1995) consists of 10 items related to the confidence patients have in their stress coping abilities. The items were formulated as statements and the patients responded on a five-point Likert scale ranging from (1) not at all true to (5) exactly true. Examples of the statements are: 'I can always manage to solve difficult problems if I try hard enough' and 'I can remain calm when facing difficulties because I can rely on my coping abilities'. This unidimensional scale was used in paper II. The instrument has been used in several studies and has good psychometric characteristics in clinical samples in Norway (Leganger et al., 2000).

The questionnaire also included a section where patients reported positive and negative life events experienced during the last year. This measure was used in paper II. The patients reported significant life events in two open-ended text boxes, one for positive events and one for negative events. For space preserving purposes, a maximum number of five positive and five negative events were recorded. A few examples were provided of significant positive and negative life events such as the birth of a child, death of a spouse and religious experiences. The patients defined the events and whether they had positive or negative impact on their life (Melberg et al., 2003). The number of positive and negative life events reported by each patient was counted. A sum score was separately established for positive life events and negative life events, with scores ranging from 0 to 5 for each patient. A score of 0 reflected no reported life events and 5 reflected a maximum number of reported positive or negative life events.

The section that covered demographics and substance use characteristics was an adjusted version of the Norwegian National Client Assessment Form (NNCA) (Gerds & Iversen, 2000; Iversen et al., 2008). This instrument is usually applied with semi-structured interviews between physicians and patients. A research group of clinicians, researchers and patients who manifested substance use disorders collaborated to simplify and adjust the instrument for self-completion ease. Components from this section were included in all the papers related to the empirical material based on the questionnaire survey (papers I, II and III).

The original version of the NNCA covers an extensive item battery related to demographics, substance use characteristics and coping resources. For the purpose of the present study, the following demographic characteristics were recorded: gender, age, housing (private housing, no housing or living with others) and levels

of completed education (not completed primary/secondary, primary/secondary, high school or university/college). In addition, information was recorded about patients' civil status (single, boy/girlfriend, live-in-partner, married, separated, divorced or widow/widower), parental status (children or no children), employment status (full time, part time, student, no employment) and major source of income (e.g. social benefit, work-related income). Detailed information about substance use characteristics was limited to a total of four substances for space-preserving purposes. The patients reported the characteristics of their main substance of choice and three other substances that they frequently used. Substance use characteristics included the specific types of substances, age when the patients began using each substance (age of onset) and the total number of years of problematic use for each substance.

We also included a measure of relapse to substance use after discharge from treatment, which asked the patients about the time interval from when they were discharged from their last attended treatment programme until their substance use increased to a level where more treatment was perceived as necessary. The time interval was operationalised by the number of days, weeks, months or years to relapse occurred after discharge from treatment. The instrument also included a response option for patients that had not relapsed after their prior treatment. Time to relapse data was solely completed by those who had previously attended treatment for substance use disorders. Hammerbacher and Lyvers (2006) employed a similar retrospective measure of relapse.

Finally, the questionnaire included retrospective measures of treatment background variables that covered the type of treatment programmes the patients had previously attended, the number of times the patients had attended these programmes and the total amount of time they had been enrolled in the specific programmes. Patients also reported whether a physician had diagnosed them with any of the following psychiatric diagnoses during their lifetime: depression, anxiety, schizophrenia, personality disorders, obsessive disorders, PTSD, ADHD and eating disorders.

A draft version of the questionnaire was pilot tested among five patients enrolled in long-term inpatient treatment for substance use disorders. After these patients had completed the questionnaire, the different components of the questionnaire were discussed in a focus group. The patients were encouraged to ask questions and elaborate about test items that were poorly formulated or difficult to answer. The majority of feedback related to the adjusted version of the NNCA. Thus, amendments to the previously validated measurement instruments were not carried out. In addition to rephrasing of specific test items and general

improvements to the question framing in the modified NNCA, the patients suggested several additional items which they considered relevant for individuals with substance use disorders. The majority of their suggestions were integrated into the final questionnaire. Generally, the use of a focus group resulted in a number of substantial improvements to the questionnaire.

2.2.2. Interview guide

A methodology based on semi-structured interviews and contextual content analysis (see section 2.4) was considered suitable to investigate psychosocial and contextual variables related to how patients perceive their treatment and recovery processes. The interview guide developed for the present study was based on relevant published studies (e.g. Bacchus et al., 1999; Lovejoy et al., 1995). In addition, the guide was based on discussions and suggestions from a research group consisting of clinicians and researchers, research assistants and patients manifesting substance use disorders. The first section of the guide instructed the interviewer to inform the patients about the purpose of the study. This section also instructed the interviewer to inform the patients that they could withdraw from the study at any time, that the conversations would be tape recorded and how the data would be stored and maculated after analyses.

The guide covered three core topics. The first topic related to how the patients experienced their life situation before treatment initiation, which included their perception of their level of substance use, social support and psychological functioning pre-treatment. The patients were also asked about their reasons for entering the treatment programme in regards to whether there were specific events or primers that triggered the patients to seek treatment.

The second topic covered how the patients experienced various components in the treatment context. The questions addressed evaluations of the applied interventions and whether these interventions were well matched to the specific problems. Moreover, patients were asked about positive and negative aspects of the facility regulations and how they perceived the qualities of the social relations between the patients and treatment personnel. The patients also answered questions about the structural system of the clinics. For instance, they were asked about how they experienced the information flow and communication between personnel at the clinics (i.e. ward atmosphere). In addition, this section of the guide asked the patients whether they and/or their significant others had been actively involved in decision making related to treatment progress.

The final topic was about how patients perceived their current life situation. The questions focused on the quality of the patients' relationship to significant

others, current level of substance use, psychological functioning and participation in occupational activities. This section also asked patients to elaborate on the quality of aftercare and whether the treatment facility collaborated with community services to establish occupational activity for their patients. Questions about economy-related issues, housing and other contextual success factors were included.

A section related to background characteristics was included near the end of the guide. The characteristics collected included the age of the patients, which treatment programmes they had been enrolled in, information about occupational activities and time period at the relevant treatment programmes.

2.3. Statistical procedures

Violation testing was performed for outliers, normality, linearity and multicollinearity before analyses were conducted. This was carried out by visual examination of residual plots, histograms of frequencies, scatter plots and collinearity diagnostics, respectively. The expectation maximisation (EM) algorithm was used to impute missing values on the measures of psychological constructs used in paper II and III. The algorithm maintained the relationships between the imputed items and other variables in the measures because the values of specific items were estimated by the values of other items within the relevant measures. The algorithm estimated the likelihood of several potential values and imputed the value that was more likely to be correct (a maximum likelihood method).

Descriptive statistics were carried out to investigate sample characteristics. To compare the representativity of the present sample for the target population, the tables function in SPSS was used to reveal patient characteristics in the aggregated data obtained from the population sample (paper I). Percentiles in the aggregated data were compared with the present sample on all characteristics that were measured similarly and were available in both data sets. Chi-square (χ^2) analyses were carried out in paper I and III to investigate differences in categorical variables (e.g. gender and education) between subsamples. Similarly, independent samples t-tests were used in subsample comparisons on continuous variables such as age and weeks in treatment. These analyses used the conventional significance level of .05. To examine the internal consistency of the measurement instruments, Cronbach's α -values and average corrected item-total correlations were calculated and reported in paper II and III. An α -value of .70 and average corrected item-total correlations above .30 are considered satisfactory (Hair et al., 1998; Nunnally, 1978). However, the α is sensitive to the number of test items included in a scale (McKinnell, 1978).

For instance, high α -values may occur because the scale includes a high number of items. This constitutes a potential weakness in estimations of internal consistency by the α . The inclusion of the average corrected item-total correlations could adjust for this bias and, therefore, were reported along with the α -values.

Several multivariate statistical procedures were performed to investigate the postulated aims. In paper I, a backward stepwise Cox proportional hazards regression model (Cox, 1972) was executed to study the time intervals from treatment to relapse as well as factors that prolonged or reduced this time interval among patients. Model comparisons were conducted using Wald significance testing. A backward procedure was used because it usually reveals relatively similar results to a forward procedure. When the results between these procedures do not correspond, a backward procedure could detect variables that the more conservative forward procedure could miss. The testing was initiated with a model that included all the covariates (i.e. risk and protective factors) entered into the analysis. Covariates that failed to obtain a significance level of .50 were excluded by the stepwise procedure. All respondents in the sample (N = 352) were entered into the analysis of relapse. A status variable was used to identify the patients who reported a relapse and patients who did not report a relapse after their initial treatment or had their first treatment entry (1 = relapse, 0 = no relapse). The status variable was analysed in relation to the continuous time-to-relapse variable where patients reported the number of days, weeks, months or years until a relapse occurred. This variable only included information from those who reported a relapse (i.e. patients who did not report a relapse after their prior treatment or had their first entry to treatment were excluded by the analysis).

The relapse patterns of the respondents were examined by survival and hazard curves derived from the Cox-regression analysis. The time interval to relapse was represented by a survival curve, which illustrated a curve for respondents' probabilities of not experiencing a relapse over time. Time in days was represented at the x axis, while the probability of not experiencing a relapse (i.e. survival ratio) was reported along the y axis. This curve was estimated while the covariates were set to their respective means. The influence of the risk factors on the time-to-relapse variable was represented by hazard ratio curves. The hazard ratios include information about how a risk factor influences the odds of having a relapse. These ratios can be interpreted by positive or negative beta coefficients. A positive beta coefficient shows that by increasing a risk factor by one unit the probabilities of a relapse increase. Similarly, a negative beta coefficient shows that by increasing the risk factor by one unit the risk of relapse decreases. The beta coefficients are interpreted in relation to a reference category for categorical covariates, such as

levels of education and age-groups. However, the specific hazard ratio values yield important and more intuitive information on how groups differ in hazard risk compared to a category of reference. For instance, a hazard ratio of .10 means that a group has 90% smaller hazard risk than the category of reference. Conversely, a hazard ratio of, for instance, 1.70 reflects that a group has 70% higher hazard risk compared to the reference category. A hazard ratio of 1.00 shows that the covariate is weakly related to the hazard event in question. For continuous variables, the same interpretation applies to the hazard risk for a one unit increase in the covariate. This means that the logic of the hazard ratio is similar to the interpretation of odds ratios in logistic regression analysis. Confidence intervals (CI 95%) were also reported together with the hazard ratios in the analysis. These intervals are interesting because they indicate the range of hazard ratio values present in the population with a certainty level of 95%. In terms of interpretation, the lower bound of the CI should usually be below 1.0 if a covariate reduces the risk of a relapse. Similarly, the lower bound of the CI should indicate that the hazard ratio exceeds 1.0 in the population if the covariate increases the probability of a relapse (see also Spruance et al., 2004).

The Cox proportional hazards regression model was originally developed for prospective cohort studies in which the respondents are followed up over time. Such analysis is often applied to investigate the time until an event or a specific outcome occurs among the respondents (e.g. relapse). In cohort studies, the data from people who do not relapse are usually treated as censored data. This means that the elapsed time until, for instance, a relapse occurs (if the individuals relapse) is unknown. Data about people who cannot be located at follow-up are also treated as censored data. The Cox proportional hazard regression model can also be used for both retrospective (e.g. Ogata et al., 2000) and cross-sectional data (e.g. Lee & Chia, 1994). Censored data was not used in the present study because we used a cross-sectional retrospective design and solely obtained time-to-event data from patients who had a relapse after attending their most recent treatment programme.

Structural equation modelling (SEM) was applied to test a model that used positive and negative life events, psychosocial distress and self-efficacy as predictors for substance use (paper II). An advantage of SEM compared to more common multivariate techniques, such as multiple regression analysis, is that SEM allows the variables to be both dependent and independent in the same analysis. For example, self-efficacy can initially be treated as a dependent variable influenced by psychological distress and then operate as an independent variable by influencing substance use. Hence, SEM allows us to test more complex variable associations than regression analysis. The AMOS software, which was used for the

analysis, provided a consistent interface for the structural modelling. SEM incorporates multiple regression and Confirmatory Factor Analysis (CFA) (Ullman, 2007) into one analysis. SEM analysis can either be used to test how well a predefined hypothesis fits the data or to explore relationships without specific pre-assumptions about the associations between variables (Bollen & Long, 1993). In paper II, a predefined model based on previous research was hypothesised and tested. However, theoretically meaningful adjustments, as suggested by the modification indices, were considered acceptable, which means that a combination of a confirmatory and exploratory approach was carried out.

The estimated relations in SEM analysis are not equivalent to causal relations. The analysis allows for indirect testing of causal assumptions and disfavours models inconsistent with the data. The chosen method for estimation was the maximum likelihood method. The correspondence between the estimated model and the data was examined by fit indices. Paper II reported the χ^2 with the associated degrees of freedom (DF) and significance level, Root Mean Square Error of Approximation (RMSEA) and the Comparative Fit Index (CFI). Clear-cut criteria for a good fitting model have yet to be established. However, researchers have suggested that a RMSEA around .05 (Hair et al., 1998) and a CFI ranging from .95 to 1.0 indicates good model fit. The RMSEA is one of the more feasible indicators of model fit, because it is relatively independent of sample sizes (Loehlin, 1998). An additional advantage is that the RMSEA rewards simple parsimonious models with fewer parameter estimates (Hooper et al., 2008). The χ^2 is sensitive to larger samples (Friborg & Hjemdal, 2004) and is usually inflated towards significance in samples that comprise more than 200 respondents. This means that when larger samples are used in the analysis, the χ^2 could erroneously indicate that the estimated model deviates significantly from the covariance matrix. Therefore, the χ^2 could not stand alone from the other fit indices when the overall fit for the models was investigated in paper II.

Multi-group SEM analysis was performed in paper II to investigate gender differences in the model. This was done by testing invariant and non variant models. The invariant model constrained the structural relations to be equal among males and females, whereas the non variant model did not place parameter constraints on the structural path coefficients. If the non variant model is supported by the data, the model applies to both genders, but differences are detected in the strengths of structural path coefficients. When the invariant model is supported, both the model and the strengths of the structural path coefficients are equal across gender. For the purpose of choosing between the competing models in the multi-group SEM analysis, Akaike Information Criterion (AIC) indices were examined in

addition to the fit indices mentioned above. A lower AIC-value indicates the model that potentially has better fit to the data. In order to determine which of the models corresponded better to the data, a combination of the fit indices and a χ^2 difference significance test were investigated.

In paper III, multivariate analysis of variance (MANOVA) was used to test whether patients with different levels of illicit substance and alcohol use differed in psychosocial distress. This analysis allowed for the inclusion of several dependent and independent variables while controlling for a number of covariates. MANOVA tested whether the overall main effects of the independent measures on the dependent variables were statistically significant. Information from the univariate part of the analysis was used to investigate the specific dependent measures that obtained significance. An advantage of this approach over performing several repeated univariate analyses of variance (ANOVA) is that MANOVA avoids inflation of type I errors by an increasing number of dependent variables. Estimates of effect sizes (Cohen's *d*) were also included in paper III. These were calculated to examine the strength of group differences. A *d*-value around .10-.20 is usually interpreted as a small difference, .40-.50 as a medium difference and a value around .70 or above reflects a strong difference (Cohen, 1992).

2.4. Qualitative analysis

A contextual content analysis was performed to investigate contextual and psychosocial factors of potential relevance for treatment and recovery processes in paper IV. This qualitative technique results in quantitative descriptions of the properties of a text (Joffe & Yardley, 2004). One of the more important decisions concerning a contextual content analysis is related to the choice of the counting unit. The transcribed interviews consisted of 113 056 words and on average each interview contained 8697 words. For the purpose of the study reported in paper IV, sentences were judged to be a manageable and informative counting unit.

The content of sentences in the transcribed interviews was interpreted and the counting units were labelled and allocated into two major categories, which were deductively established after repeated readings of the transcribed interviews and before the analyses were carried out. The two main categories were termed: (1) perceptions of treatment and (2) perceptions of recovery. Subcategories were established within the major categories during coding. This was performed when the sentences were judged to represent unique thematic aspects of the two major categories of interest; a combination of deductive and inductive coding approaches was carried out. The specific sentences in the material were described and presented as more general themes (free text descriptions). Coding was carried out

with the QSR NVIVO 8.0 software, which provided a consistent interface for the coding process.

During the interviews and initial reading of the transcribed material, it was clear that the majority of sentences regarding perceptions of treatment and recovery processes were either positive or negative in content. Therefore, the sentences were segmented into positive and negative factors under the two major categories. An advantage of this distinction is that it was possible to investigate contradictory information in the material more directly. Examination of contradictory information is an adequate approach to avoid the analysis becoming overly influenced by the perceptions and presumptions of the researcher. Furthermore, this technique could help avoid overgeneralisations by the empirical material (Malterud, 2002). Sentences considered unrelated to the two major categories or too complicated to distinguish into positive and negative perceptions were excluded from further analysis (Weber, 1990). Identical sentences repeated within specific interviews were coded once.

One researcher carried out the coding, and definitions were established for each category to increase the reliability and validity of the data. Inter-rater coding reliability was examined using the Cohen's Kappa (κ). The κ takes agreement that occurs by chance into account and is considered to be a robust estimate of the level of coding agreement of the researchers (Wood, 2007). The first author and a research colleague blinded to the purpose of the study independently coded three identical interviews chosen at random. The level of agreement between the two researchers was recorded ($\kappa = .43$). In addition, the validity of the established categories was increased by discussing the content with other researchers, who were blinded to the purposes of the study. Adjustments to category definitions were made accordingly after feedback from these researchers.

A contextual content analysis results in quantitative representations of qualitative data. Therefore, one can discuss whether this is a qualitative or quantitative method. However, contextual content analysis does not solely imply a quantitative assessment of qualitative material. The distinction between positive and negative perceptions meant that the coder had to investigate and draw inferences about the content and context in which the sentences occurred. The counting units were not considered in isolation from the textual information around them. This approach separates a contextual content analysis from a quantitative content analysis. A quantitative content analysis usually implies that the frequencies of counting units are established without contextual interpretations by the researcher (Stemler, 2001). Consequently, quantitative content analysis could be regarded as a quantitative method, whereas contextual content analysis is a

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qualitative methodological approach to the data. An advantage of a contextual content analysis over other qualitative analyses is that it provides the researcher with a relatively clear-cut set of methodological procedures to investigate the properties of textual information (Joffe & Yardley, 2004). These procedures can increase the reliability and traceability of the results. The results might become less idiosyncratic than by, for instance, a discourse analysis or phenomenological approaches.

3. Results

3.1. Paper I: Relapse patterns among patients with substance use disorders

Research regarding the time interval after discharge from substance addiction treatment to a potential relapse remains relatively scarce. The core aim of paper I was to investigate the time interval and the contextual and psychosocial factors associated with increased or reduced time interval between treatment discharge and relapse among patients ($N = 352$). The included factors ranged from patients' age, educational level, employment and gender to psychiatric diagnoses and substance types (e.g. amphetamines, opiates) used by the patients. Relapse patterns and risk factors of relapse were investigated by survival analysis (i.e. a Cox proportional hazards regression model). Among the 352 patients, 160 individuals (46%) reported that they had experienced a relapse after their initial treatment. The 54% who did not experience a relapse were either in their first enrolment to treatment ($n = 143$) or had re-entered treatment without experiencing a relapse after their previous treatment enrolment ($n = 49$). The results showed that the relapse risk was very high during the immediate time after treatment. The majority of relapses occurred during the first month after treatment; the median time to relapse was 21 days. The probability of not experiencing a relapse (i.e. the survival ratio) was at the zero level about 16 months after treatment. Adolescents aged between 18 and 25 years had a significantly higher relapse risk than older patients aged between 41 and 80 years. The relapse risk was also significantly higher for patients who were unemployed compared to patients with regular employment. Patients, who used opioids or alcohol as main substances, had higher relapse risk compared to the category of reference (i.e. stimulants). Individuals who had attended inpatient treatment had a significantly longer time to relapse than patients who had not attended such treatment. A high number of attended treatment programmes was associated with the risk of early relapse. The findings underline the importance of establishing sufficient aftercare and treatment follow-up for patients before they leave the treatment facilities such as establishing occupational activities for the patients. Treatment follow-up should be differentiated according to individual needs. An increased focus on the perceived consequences of substance use and treatment motivation among adolescents could reduce the relapse risk among these patients.

3.2. Paper II: Interrelations between patients' personal life events, psychosocial distress and substance use

The aim of paper II was to test a hypothesised model where significant life events, interpersonal problems, psychological distress and self-efficacy predicted substance use. An additional aim was to study gender differences in the associations between these variables. A questionnaire was distributed in 16 Norwegian clinics to patients who had manifested substance use disorders ($n = 222$). Patients on waiting lists and those who had completed their treatment ($n = 130$) were also recruited. The respondents completed a questionnaire that consisted of validated measures concerning psychological distress, interpersonal problems, self-efficacy and substance use. The patients defined the relevant significant life events experienced during the last year and reported whether these had positive or negative impact on their life situation. The relations between the predictors and substance use were examined using SEM analysis. A multi-group analysis was performed to examine whether there were gender differences in these relations. The modification indices showed theoretically meaningful improvement potential in the hypothesised model. Therefore, direct paths were added from interpersonal problems and positive life events to self-efficacy and from negative life events to psychological distress. These small amendments improved the fit of the model. The model showed that accumulated negative life events were strongly associated with increased substance use. A non-significant tendency of reduction in substance use by positive life events was also detected, but these events were more related to self-efficacy. Negative life events were also related to self-reported current psychological distress. Such distress was the strongest predictor of increased substance use in the structural model. Interpersonal problems had an indirect relation to substance use through increased psychological distress and reduced self-efficacy. Sub-group analysis by gender indicated that the associations between the predictors and substance use differed among male patients and female patients. A strong direct relation between negative life events and substance use was found solely among male patients. The results also showed a statistical tendency for positive life events to be associated with reduced substance consumption among male patients. Psychological distress was more strongly associated with substance use among female patients. The importance of positive life events for self-efficacy was more predominant among female patients. Negative life events had stronger associations to psychological distress among males, whereas the relation between interpersonal problems and psychological distress was somewhat stronger for females.

3.3. Paper III: Do severity levels of substance use relate to self-reported variations in psychosocial distress?

Paper III aimed to investigate whether psychological distress and interpersonal problems differed among patients with high and low severity levels of substance use. Patients were separated according to cut-off scores, which reflected whether they had high ($n = 59$) or low severity levels ($n = 186$) of illicit substance use. Similarly, patients were divided into high ($n = 54$) and low ($n = 151$) consumption groups according to their self-reported severity levels of alcohol use. MANOVA showed that the overall main effect of consumption level of illicit substances was highly significant when variables such as gender, education and employment status were controlled for. The main effect of alcohol consumption also reached significance, whereas the interaction between alcohol and illicit substance use failed to reach significance. The group with a high severity level of illicit substance use reported systematically more psychological distress. This was especially true for anger-hostile, somatic, depressive and obsessive-compulsive symptom load. Differences were stronger for anxious symptom load related to alcohol consumption. Variations in interpersonal problems were relatively small for both illicit substances and alcohol. However, the results revealed that patients with high use of illicit substances reported stronger desire to use manipulative actions and tendencies to control social interaction. Patients with high severity levels of illicit substance use were also more prone to be suspicious and egocentric in social settings. Individuals who reported high alcohol consumption also reported more problems related to spending time alone and were more likely to require excessive amounts of attention in social contexts. The results imply that the patients who reported a severe level of illicit substance use experienced strong symptom load across a variety of psychological symptoms. It is possible that these patients are more sensitive to general negative emotional states and thereby become more vulnerable to excessive substance use. The results also support that high levels of alcohol consumption are associated with increased anxious symptom load. Patients with anxious tendencies could be more likely to use substances with sedative psychopharmacological properties as these substances may temporarily alleviate their symptoms. The small differences in interpersonal distress could indicate that interpersonal problems are more indirectly associated with substance use than psychological distress.

3.4. Paper IV: Treatment and recovery as perceived by patients with substance addiction

Psychosocial and contextual factors related to perceptions of treatment and recovery processes among service users are likely to reflect the quality of health care services. Despite the importance of these perceptions, few studies have investigated psychosocial and contextual factors related to how patients with substance use disorders perceive their treatment and recovery processes. This was the aim of study IV. This empirical study used semi-structured interviews with 13 patients with substance use disorders to investigate factors with potential importance for treatment and recovery among them. The patients were strategically sampled from five inpatient facilities located in two Norwegian counties in the central region of Norway and an OMT clinic located in Trondheim. The interviews were transcribed and coded using contextual content analysis. Inter-rater coding reliability estimated by Cohen's Kappa (κ) was .43. The results showed that the service users reported a fairly balanced pattern of positive and negative perceptions of their treatment processes. The patients focused on social relationships within the clinics when talking about their treatment experiences. They underscored the importance of therapeutic relationships characterised by mutual trust and respect between the clients and treatment personnel and the mutual support between the patients who were enrolled in the programmes. The patients also stressed the importance of a good match between their specific problems and therapy. Consistent practice of facility regulations was also important for the interviewed patients. The perceptions of recovery were mainly positive among the service users. These perceptions focused on psychosocial improvement and reduction in substance use. The majority of patients reported that they had more self-confidence, and felt that after treatment they were more capable of coping with life situations without turning to substance use. The interviewed patients stated that they had reinitiated hobbies and other activities, which previously had been neglected because of their addictive behaviours.

4. Discussion and implications of the findings

The main objective of the present thesis was to examine contextual and psychosocial factors associated with relapse, substance use and perceptions of treatment and recovery processes among patients with substance addiction. The specific aims were investigated and discussed in four empirical papers. The first paper focused on the time interval from patients' treatment discharge to potential relapse and contextual and psychosocial variables that may increase or reduce this time interval. These variables covered factors such as occupational activity, gender, education, psychiatric diagnosis and treatment history variables. In addition, a model that used positive and negative life events, psychosocial distress and self-efficacy as predictors of substance use was investigated for the complete sample and in sub-group analysis by gender (paper II). The study of differences in specific psychosocial symptoms related to severity level of substance use was reported in paper III. In paper IV, the investigation of contextual and psychosocial factors related to how the patients perceived their treatment and recovery processes are presented.

Together, the research papers presented and discussed the specific aims necessary to address the core objective of the study. The papers aimed to investigate how different contextual and psychosocial variables relate to possible key elements in recovery such as relapse risk and substance use. Paper IV also shed light on psychosocial and contextual variables important to how the patients experienced their treatment processes and overall recovery from substance use disorders. The results of the four papers show that contextual and psychosocial variables substantially contributed to relapse risk, substance use and the patients' general perception and satisfaction of treatment and recovery processes. The overall main conclusion of the thesis is that the results show that patient outcomes and recovery from substance use disorders cannot be solely facilitated by influencing intra-psychological emotions and cognitions through therapeutic interventions. A more holistic approach to substance use disorders that also takes into account the material and social resources available to patients outside the treatment context can potentially reduce the likelihood that patients relapse and continue to use substances after discharge from treatment.

These findings imply that treatment of substance use disorders should be considered an interdisciplinary field of research and practice. The findings in the four articles imply that patients could benefit from improved coordination between services, namely substance use disorder treatment, psychiatry, somatic medicine and community agencies. Rather than integrating treatment of substance use disorders into one of these specific domains of health care, treatment programmes

could include components from each of these services. When an individual patient enters treatment for substance use disorders, that patient could be met with coordinated aid from community services, psychiatry and somatic hospitals.

Recovery processes should not solely be facilitated and defined within the context of clinical treatment units. As recovery can also translate into improvements in the patients' housing, job situation, financial situation, relapse-coping abilities and social networks, many of the interventions needed to facilitate recovery could take place in the context of the patients' daily lives. Community services could focus on contextual and psychosocial success factors before, during and after the patients receive treatment in specialised units for substance use disorders (Bacchus et al., 1999). The patients could potentially benefit from increased exchange of competence between clinicians and personnel in social community services. For instance, personnel from specialised treatment for substance use disorders could contribute their clinical expertise when preventive interventional programmes for substance use disorders are developed. Similarly, personnel from the community services could become involved when clinicians and patients develop individual plans for treatment and aftercare.

Because knowledge about a wide range of psychosocial and contextual factors is necessary to establish effective interdisciplinary interventions for substance use disorders, the current study focused on a broad range of factors related to relapse, substance use and perceptions of treatment and recovery processes.

4.1. Relapse to substance use

The present study investigated the time interval from treatment discharge to relapse among patients with substance use disorders. It was hypothesised that the relapse risk would peak during the first months after treatment. The data supported this hypothesis. About 46% of the sample ($n = 160$) reported a relapse after their initial treatment. The relapse patterns showed that the majority of relapses occurred during the first month after treatment discharge. After about 16 months the likelihood of not having a relapse was almost zero among the respondents. This finding is consistent with previous research (Gossop et al., 2002; Hunt et al., 1971). These results imply that aftercare and treatment follow-up should be in particular focus during the first 16 months after the patients are discharged from treatment. Individual treatment plans should not solely include information about their treatment at the facilities, but should also include aftercare suited for the individual needs of the patients. In the light of these results, proper implementation of the coordination health reform (Norwegian Ministry of Health and Care Services, 2009) should be prioritised.

The implementation of the coordination health reform requires that service providers, who traditionally have operated separately and merely referred patients to each others' systems (e.g. treatment facilities for substance use disorders, community services and psychiatric services), coordinate their health services. Such coordination implies that personnel from clinical units and community services should meet regularly, along with the patients, and develop binding agreements that describe the coordinated health services adjusted to individual patient needs (i.e. individual plans). A possible way to implement improved coordination between different service levels could be to establish collaboration coordinators at each treatment unit for substance use disorders. These coordinators could establish and maintain contact with external service providers in the municipalities and ensure that they are involved during the development of binding patient plans. The coordinators could also involve these services before patients, for instance, are transferred from clinical treatment to social services. This could provide these services with information about the specific problems and resources of the individual patient and make the transition between health service levels more predictable for the patients. Common formal and informal meetings for employees in different health sectors could also help increase collaborative efforts across different service levels.

However, the coordination reform allocates the economic resources for coordination to the municipalities and treatment facilities without a clearly defined framework for how these resources can be effectively used. One may argue that the clients' and services' needs differ to such an extent across Norwegian municipalities that different implementations of coordination efforts are required. Yet, there could also be common challenges among people with substance use disorders in the Norwegian municipalities. Therefore, research should aim at investigating and documenting specific coordination measures that are effective for the recovery of patients. In order to reduce the probability of relapse after patients are discharged from treatment, health services and municipalities should facilitate coordinated measures that translate into coherent and un-bureaucratic rehabilitation systems for the individual patients.

A promising approach termed the Qualification Programme has recently been developed by the Norwegian Labour and Welfare Administration. This programme constitutes several individually differentiated activities aimed to improve client coping and functioning in society. In this programme, the individuals learn how to write applications and receive housing consultation. Physical training and leisure activities are also important components of this programme. The main objective of the programme is to facilitate about 50% part time occupational activities for the

patients after one year in the programme. If treatment facilities for substance use disorders collaborated with this programme, it could provide the individuals with opportunities to participate in alternative activities to substance use during the first critical year after discharge from treatment.

However, an evaluation of this programme identified several challenges regarding follow-up and individual adjustments to patients with different resources and capabilities (Legard et al., 2009). For instance, it may be stigmatising to educate people in writing applications when they have been productive in educational and occupational systems before they manifested excessive substance use. Moreover, several patients with substance use disorders were rejected when they applied to the programme because the staff in the programme reported that they did not have sufficient competence related to substance use disorders. Yet, the evaluation showed that the service providers reported improved capability to help those who did not benefit from alternative services or had dropped out of other social service programmes. The qualification programme could have potential as aftercare and follow-up for patients with substance use disorders if sufficient competence regarding substance use disorders and psychiatric disorders is established in this programme. The programmes could also become more flexible and be adjusted to the competence levels of the users.

The relapse patterns found in the present study also emphasised the importance of realistic expectations of outcomes among patients with substance use disorders. Unrealistic expectations of an immediate, permanent, complete cure of these disorders after treatment could hinder people returning to treatment after a relapse. Such expectations may also result in more reluctance and resistance to seek out help for substance use disorders in the first place (Sellman, 2009). Therefore, clinicians should consider relapse a part of a longer recovery process and not indicators of lower recovery potential. This approach is in line with the stages of change model (Prochaska et al., 1992). Clinicians can encourage openness about relapse during clinical consultations and focus on risk situations that facilitate relapse. Thereafter, problem domains that trigger relapse could be targeted by clinical interventions. According to the relapse-prevention model (Marlatt & Gordon, 1985) this could be carried out by psycho education in how to identify external and internal cues related to specific risk situations of relapse. Such cues could be, for instance, external or internal stressors, positive expectations of the short-term effects of substance use and certain people in the social environment of the individuals. The patients may learn more effective coping skills for these situations or learn to recognise the cues and avoid or escape these risk situations. It is also important to inform the patients that these situations alone do not constitute

risk and that individual interpretation of the situations may be more relevant for outcomes.

Another interesting approach that could reduce relapse risk among patients with substance use disorders is Community Reinforcement Approaches (CRA), which is closely linked with the behavioural choice theory (Bickel & Vuchinich, 2000). The CRA is based on the assumption that substance use could be reduced by increased negative consequences and social costs. This can be accomplished by providing the individual with alternative rewarding social activities to substance use (see also Miller & Meyers, 1999 for a detailed clinical overview). Moos (2007) argued that this could be established by helping the patients to restructure their social contexts and to establish activities that serve a similar purpose as substance use (e.g. meaningful work, physical activity and positive social relationships with significant others). Ultimately, these activities may compete with substance use when the individuals consider the behavioural choices are available to them. An important aspect of activities, such as for instance work, education and physical activity, is that substances are usually unavailable where the activities are carried out. The protective properties of alternative social activities were also emphasised by the social control perspective (Hirschi, 1969). This perspective views deviant behaviours, such as excessive substance use, as more likely when the individual lacks bonds to family and friends with monitoring and shaping functions. In addition, the probability of substance use may increase when the person lacks access to the supervisory functions of work-related activities. Such activities require concentration and attention, which may reduce the focus on substances (Hirschi, 1969; Moos, 2007). Future research should avoid the mere investigation of the effectiveness of the relapse-prevention model and CRA because perhaps a combination of these approaches could work better for the patients. Instead, future studies could examine whether patient outcomes improve when CRA are combined with treatment approaches adopted from the relapse-prevention-model compared to the two approaches in isolation and treatment-as-usual.

Indications of the potential effectiveness of the CRA also received support in the present study. In line with the research hypothesis and previous work (Al-Nahedh, 1999; Xie et al., 2005), the results showed that patients with full time employment had lower relapse risk compared to patients who were unemployed. Thus, a countermeasure for relapse could be to initiate occupational activities for the patients. Because a cross-sectional retrospective design was used, it cannot be entirely ruled out that patients had a full time employment simply because they avoided relapse over extended periods of time rather than the other way around. However, the semi-structured interviews in the present study showed that the

patients attributed relapse-avoidance to the possibility they had to take part in occupational activities. In addition, the interviews showed that patients who returned to their original social networks after treatment were more tempted to revert back to substance use. The workplace is often a social arena where the patients could establish new social networks. Such new networks could promote resistance to relapse and help establish a new life style for the patient. This idea has received empirical support (Robins, 1974). As discussed, the treatment facilities could collaborate with community services and establish training programmes for occupational activities before the patients complete their treatment. The qualification programme and CRA approaches may be feasible measures to accomplish this.

In line with the behavioural choice theory (Bickel & Vuchinich, 2000), occupational activities can serve as a domain where the individuals experience alternative rewards to substance use, which may significantly reduce the risk of a relapse. Participation in work-related activities also provides the patients with the security of regular income, without which it is difficult to keep private housing, pay for vital living expenses and avoid the accumulation of personal debt. In addition, occupational activities can reduce the stigmatisation of these patients. It is likely that patients who successfully take part in conventional work-related activities receive less discrediting attitudes from others. According to the patients who participated in the semi-structured interviews, factors related to finances, housing and stigmatisation are important for relapse to substance use after treatment. Overall, the study supported that these factors are relevant components in recovery from substance use disorders.

However, the labour market has tightened in Norway after the recession that followed the financial crisis. This may present challenges to employing patients who recover from substance use disorders. In addition, individual differences and capabilities must be taken into account when placing these patients in occupational activities. Some patients may not have the required levels of functioning to take part in these activities directly after treatment because of barriers such as co-occurring psychological disorders or lack of housing or supportive social networks. Were these patients to be incorrectly employed after treatment, they could experience reduced coping abilities. Stigmatising attitudes from co-workers could also result in worsened coping capabilities. Clinicians could provide alternative psychiatric outpatient treatment for patients who manifest psychiatric disorders and initiate work training when their psychosocial functioning suggests that they are ready to take part in such programmes.

It was hypothesised that younger patients would experience a shorter time interval from treatment discharge to relapse than older patients, and the results supported this: younger patients had a significantly higher relapse risk than older patients. This finding is in accordance with previous results (Oslin et al., 2002). Explanations for these results is perhaps that younger patients have yet to experience the negative consequences of excessive substance use or they may fail to recognise the negative consequences of their substance consumption, which makes early relapse after discharge from treatment more likely (i.e. they may be in the pre-contemplation stage of behavioural change) (Prochaska et al., 1992). Clinicians could increase their focus on relapse risk in this particular group and aim to change adolescents risk perception regarding substance use. This could give younger patients more insight into the potential hazardous effects of excessive substance use and facilitate progress to the contemplation and action stages of change for these patients.

Models of health behaviour advocate that perceptions of risk could influence behaviour. For instance, the health belief model (Rosenstock, 1974) argues that protective and risk-mitigating behaviours are more likely when individuals perceive themselves as vulnerable to the risk items in question. This model consists of two core elements (1) threat perception and (2) behavioural evaluation. Two concepts, perceived susceptibility (i.e. whether the individuals perceive themselves to be vulnerable to a health hazard) and anticipated severities (i.e. an affective evaluation of the potential severity of consequences of this health hazard), were included in the threat perception component of the model. Behavioural evaluation also includes two sub-components termed perceived benefits (i.e. benefits obtained by initiating protective behaviours) and perceived barriers (i.e. barriers that may inhibit protective behaviours) (Janz & Becker, 1984; Stroebe, 2000). In addition, cues to action (i.e. internal cues, such as psychological distress, and external cues, such as campaigns and education), individual health motivation, self-efficacy, perceptions of control and demographic characteristics are moderators in the model (Rosenstock et al., 1994). An implication is that when people perceive themselves as vulnerable to the potential negative consequences of substance use, they may also become more motivated to reduce such use and remain abstinent after treatment.

Battjes et al. (2003) empirically demonstrated that adolescents who were not aware of the potential negative consequences of substance use had a low treatment motivation. The authors emphasised that interventions that provide adolescents with insight into the negative consequences of substance use are needed. Interventions that manage this could reduce adolescents' relapse risk and provide

these patients with motivation to re-enter treatment when a relapse has occurred. In addition to interventions targeted towards adolescents' treatment motivation after treatment, personnel at the treatment facilities could use their competence and collaborate with municipality services to develop motivational courses for young patients who are on waiting lists. This could result in improved motivation and preparation among these patients before they enter treatment. A positive side effect of pre-treatment intervention is that the transition to the treatment situation could become smoother because they are actively preparing for treatment rather than passively waiting for treatment. However, a recent study indicated that people do not focus on the severity of consequences when the probability of harm is perceived as low (Rundmo et al., 2011). Though this study was carried out for probability and consequence estimates of transport accidents, it could indicate that interventions should simultaneously target both the perceived probabilities and perceived potential severity of health consequences of substance use among adolescents. An interesting approach for future studies could be to measure risk perception regarding substance use (i.e. probabilities and consequences of health hazards due to such use) and investigate interactions between these perceptions and age and the time to relapse after discharge from treatment. These studies could also investigate whether relapse rates and perceived risk of substance use are changed by motivational courses before and after treatment.

An additional reason for higher relapse rate among adolescents could be that these patients are more often referred to treatment by external counterparts, such as the family, school or police (Callaghan et al. 2005). Studies have pointed to internal motivation as a predictor of high persistence and individual involvement in treatment (Ryan et al., 1995). Therefore, high relapse risk, premature departure from programmes and intentional relapse among adolescents could be caused by more external treatment motivation. In the study based on semi-structured interviews, young patients with a premature dropout from their treatment programme complained that the treatment facilities should have given them more attention and communicated with them when they first considered to dropout and after they had dropped out. These patients often reported that they were ambivalent to treatment and explained that they could have returned to the treatment facilities had the personnel motivated them to re-enter the programme. The relapse risk among younger people could decrease if the facilities establish alternative treatment for patients who prematurely leave the programmes. Discussion about internal motivation between treatment personnel and this patient group could be beneficial in helping adolescents re-enter the programmes.

The high relapse risk among adolescents emphasises the importance of early intervention. It is probable that many of the relapse-related problems reported by younger people in the present study could have been avoided by successful implementation of effective preventive countermeasures in domains such as schools. These countermeasures could for instance focus on the probability of developing severe substance use disorders and the severe consequences of excessive substance use among adolescents. Included in the campaigns, for example, could be information about the developing brain in adolescence and how excessive substance use in this period can cause permanent damages to structures such as the nucleus accumbens, amygdala and the prefrontal cortex. These structures are highly important for motivation, emotions and self-regulatory behaviour (Breyer & Winters, n.d.). Countermeasures could also particularly target young people in the risk zone for development of substance use disorders. Young people in the risk zone are, for instance, children of patients with substance use or psychiatric disorders (Fisher et al., 2007; Melberg et al., 2003; Pape & Pedersen, 1997). Treatment units should offer family therapy to their clients and general psychiatric health care and substance addiction treatment should include follow-up for the children of patients who are in treatment.

However, there are reasons to question the appropriateness of early intervention and follow-up of younger individuals with high risk of developing substance use disorders. While few would argue against the intentions of reducing the risk of severe substance use disorders in this group, interventions targeting specific risk groups could result in stigmatisation. This is particularly relevant when countermeasures which do not yield the desired effects are implemented. Several interventions that have been carried out among risk groups for substance use disorders had the opposite effect because they aggravated the situation for the target groups (Agedal et al., 2006). A focus on substance use problems and psychological functioning could become an additional burden that facilitates these types of risky development patterns among people in the risk groups. Gates et al. (2006) asserted that we cannot draw clear-cut conclusions about the effectiveness of different non-school based interventions for substance use. On the other hand, studies showed that early interventions could reduce substance use among younger individuals (e.g. Faggiano et al., 2005; Trudeau et al., 2003). However, the majority of evaluation studies were carried out in the United States (Faggiano et al., 2005; Gates et al., 2006) and a number of interventions conducted among adolescents in Norway have not been evaluated by research. As there may be cultural differences that influences the types of early interventions carried out and their impact on the target groups, these interventions should be scientifically

evaluated before they are implemented. Furthermore, it may also be important to consider that not all individuals within the risk groups develop substance use disorders (e.g. on account of resilience factors). Such disorders are not limited to specific societal groups, but can develop among individuals from all societal tiers. Over-focusing preventive efforts on individuals in some risk groups could result in the information not reaching other relevant groups.

In addition to differences related to patients' employment status and age, the results of the present study showed that patients who had been to several different treatment programmes had higher relapse risk compared to patients who had attended one type of programme. This could reflect a higher severity level of substance use among patients who repeatedly enrol in different treatment programmes. Grella et al. (2003) argued that patients who had complex treatment histories more often reported severe histories of substance use, substantial treatment needs and involvement in criminal activities. Anglin et al. (2001) also found a positive correlation between the number of treatment consultations and severity level of substance use. Consequently, it is relevant to examine the components in previous treatment that have been effective and those that have not been effective for these patients. Screening for barriers to effective treatment, such as psychiatric disorders, somatic problems, lack of housing alternatives, economic problems and social networks, could also yield information about why previous treatment has not been successful in improving patient coping. In addition, the previous intensity of treatment (e.g. frequency of individual therapy consultations) could be reviewed and adjusted accordingly. Research shows that patients with more complex treatment histories may benefit from increased treatment intensity operationalised by higher therapy frequencies (Hser et al., 1999). Assessment and treatment adjustments could be carried out by the assessment and consideration teams after the patients have been referred to specialised treatment for substance use disorders by medical doctors or social services.

The present study's results also supported the idea that patients who had attended inpatient treatment had a longer time interval from treatment discharge to relapse. This finding should be interpreted with caution for long term inpatient treatment because the lower bounds of the CI indicated that the hazard ratio could be more than 1.00 in the population. One could argue, however, that the inpatient treatment context is usually characterised by more control than the outpatient treatment context. The differences in treatment approaches between inpatient and outpatient treatment could result in a longer period of abstinence from substances among patients treated in an inpatient setting, which in turn may influence their capabilities to remain abstinent. Kaminer (2001) argued that adolescents are more

likely to be referred to outpatient treatment than older individuals. This may be caused by a higher threshold to withdraw adolescents from the context of their families, educational activities and other duties for a long period. However, many adolescents who have developed severe substance use disorders could benefit from treatment in a strictly controlled environment (Winters, 1999). Consequently, a specialised inpatient treatment facility for adolescents was established in the Drug and Alcohol Treatment in Central Norway during 2008, which could result in more referrals to specialised inpatient treatment for adolescents and improve the substance use outcomes for this patient group. A research project aimed at investigating outcomes among patients in this clinic is ongoing

Previous findings (Hammerbacher & Lyvers, 2006; Hunt et al., 1971; Xie et al., 2005) showed that patients who mainly used alcohol or opioids had higher relapse risk than the category of reference (i.e. stimulants). A possibility is that the withdrawal symptoms of opioids and alcohol are more extreme than those of stimulants (Lago & Kosten, 2006), which would explain a higher relapse risk among patients who primarily used alcohol and opioids. However, the present study did not measure the specific substances associated with relapse, and, therefore, it is not possible to infer that the patients necessarily experienced a relapse related to their self-reported substance of preference. It is notable though that the influences of poly-substance use were controlled for in statistical analysis and had no significant association with the time-to-relapse variable. In addition, it is improbable that a vast amount of patients change their main substance of choice after discharge from treatment. Yet, this finding should be cautiously interpreted because the lower bound CI for both stimulants and alcohol indicated that the hazard ratios could be less than 1.00 in the population. Future research should investigate the consistency and validity in these findings and examine whether such differences are due to psychopharmacological influences of different substances or less effective treatment targeting patients who use specific substances.

It was pre-supposed that there would be differences in relapse risk by gender and among patients who had high and low levels of social support. Similar differences were also expected in relation to co-occurring psychiatric disorders. The multivariate model tested in the present study did not support these hypotheses. A reason for this could be the operationalisations of social support and psychiatric disorders used in the present study. Indirect indicators of social support, such as parenting and cohabitation status, were used as measures of social support. Perhaps more specific measurement instruments about the quality and size of their social networks and includes friends and acquaintances would have yielded other results. Information from patient journals regarding psychiatric disorders could also

have provided more reliable and valid measures of psychiatric co-occurring disorders. The lack of gender difference in relapse risk may be due to the relatively low number of women in the present study. Future studies should include validated measures of social support and obtain information about psychiatric disorders from patient journals and examine relapse risk in larger samples.

Taken together, the findings show that both contextual and psychosocial variables relate to relapse risk among the patients. In the present study the more important risk factors for relapse were younger age, unemployment and the use of opioids or alcohol as main substances. Moreover, patients who had attended several different types of treatment programmes had higher relapse risk. Protective factors were full time employment, older age and attendance in inpatient treatment. Future studies could aim to examine the validity of these risk factors and protective factors over time using longitudinal designs. Studies could also investigate aftercare strategies to improve outcomes in the suggested risk groups. However, it is unlikely that the above mentioned variables yield a complete explanation of patients' substance use, which is why psychosocial variables were included in the present study.

4.2. Psychosocial predictors of substance use

The development of more appropriate clinical countermeasures that reduce the risk of excessive substance use will require identifying psychosocial factors related to substance use. The present study investigated a model where several potential psychosocial influences on substance use were included. Whether significant positive and negative life events, psychological distress, interpersonal problems and self-efficacy predicted substance use was tested using the hypothesised model. In accordance with previous studies (Kostelecky, 2005; Melberg et al., 2003; Wills et al., 1992) and the life stress model for substance use (Aneshensel & Huba, 1984) it was expected that positive and negative life events would predict substance use. Interestingly, the results showed that this was only true among males. It is possible that previous studies have overestimated the generality of the direct association between life events and substance use behaviours. The results of the present study suggest that this relation is gender-specific among patients with substance use disorders. This finding is also congruent with Taylor et al. (2000) who postulated that the fight-or-flight response to stressors is not universal among human beings, but differs according to gender. Espnes (2008) argued that females, to a larger extent, react cognitively and emotionally to stress and tend to focus on the causes of stress. Males, however, tend to react to stressors using behavioural countermeasures (i.e. a fight-or-flight response). Substance use may reflect a

learned flight response to stressors among males. Clinicians could help male patients develop other adaptive behavioural coping strategies than substance use when they are confronted with significant negative life events.

An alternative explanation for these results is that they could be due to differences in statistical power within the male ($n = 239$) and female ($n = 102$) patient groups. A possibility is that the female sample consisted of too few respondents to reject a false null hypothesis regarding the relation between negative life events and substance use (a type II error). Although this alternative explanation cannot be entirely ruled out, the female sample met the subsample requirement of about 100 respondents for multi-group analysis to be appropriate (Deng et al., 2005). Generally, it is difficult to establish equal gender samples in the population of substance use disorders because the gender distribution is skewed: 70% male and 30% female (Iversen et al., 2008). A possible countermeasure to be considered in future studies is to oversample female patients from the treatment facilities. However, this approach may reduce the ecological validity of the samples for the clinical target population.

The results showed that accumulated negative life events also predicted higher contemporary psychological distress among the patients. Congruent with the self-medication hypothesis (e.g. Duncan, 1974; Khantzian et al., 1974) contemporary psychological distress was the strongest predictor of substance use among both male and female patients. However, this relation was stronger among female patients. Previous studies have found that females tend to report higher levels of psychological distress than males (Indig et al., 2007), which could explain their differences in the relation between psychological distress and substance use. However, a significant mean difference in self-reported psychological distress by gender was not supported in the present study. An alternative explanation could be that the female patients are more prone to self-medication for psychological distress than the male patients. Longitudinal studies are necessary to investigate the validity of this and to examine if gender parameters should be added to the self-medication hypothesis.

Positive life events were expected to be significantly related to reduction in substance use (Saunders & Kershaw, 2006; Scheier et al., 1999) because these events could have stress-buffering effects on the individuals. This was not supported by the data. However, sub-group analysis by gender revealed a tendency of reduced substance use by the male patients because of such life events, whereas positive life events did not have a direct relation to substance use among female patients. These life events were more strongly related to increased self-efficacy among female respondents. This suggests that males are more likely to alter

behavioural tendencies, such as substance use, when they are confronted with positive life events as well as negative life events. Females may be more likely to use these events to improve their coping cognitions and beliefs.

Although the results showed a relation between self-efficacy and substance use that was in the expected direction, it was somewhat surprising that self-efficacy did not significantly predict reduction in substance use. Perhaps this is because a measure of general perceived self-efficacy was applied instead of self-efficacy specific for substance use. Substance use was considered as only one of several domains where coping cognitions could be relevant for patients with substance use disorders. Patients who manifest substance use disorders also experience challenges within domains such as psychological distress, life events, financial issues and stigmatisation. In addition, temptation and intention to consume substances could stem from numerous situational cues, not only cues directly related to substances (Oei et al., 2007). For instance, Laberg (1990) argued that people may become tempted to relapse or use substances simply by revisiting sites where substance use took place or by a shift in internal mood state. Consequently, it was considered adequate to use a measure of general perceived self-efficacy in the present study. Similar studies could include both substance refusal self-efficacy and general self-efficacy to increase the knowledge of how general and domain specific self-efficacy relate to substance use.

Few Norwegian studies have investigated whether psychological distress and interpersonal problems differ in relation to level of substance use reported by the patients. Past studies (e.g. Landheim et al., 2006; Møller & Linaker, 2006) have tended to use general index scores of psychosocial functioning or samples from other clinical populations. Therefore, it was investigated whether patients with high and low severity levels of illicit substances or alcohol use reported different levels of psychological and interpersonal distress. The expectation was that patients with high severity levels of alcohol or illicit substance use would have higher scores on the specific dimensions of the psychological constructs even when demographic variables, substance use characteristics and treatment background variables were taken into account.

The results supported the idea that patients with high consumption levels reported more problems concerning psychological and interpersonal distress. However, the data showed that the severity level of illicit substance use was more strongly related to differences in psychosocial distress compared to alcohol consumption level. However, patients who mainly had a severe level of alcohol consumption were older than patients who manifested a severe level of illicit substance use. Older patients are perhaps more likely to engage in occupational

activities and to have developed more sophisticated coping strategies for psychological symptoms, which was supported in the analysis of characteristics in the two subsamples in the present study. Furthermore, patients who have developed an addiction for illicit substances tend to receive more negative attitudes from the general public than patients who mainly use alcohol (Substance Abuse and Mental Health Services Administration, 2008); this often results in lower social status as well as less support and resources. Such maladaptive contextual conditions could thereby facilitate increased psychosocial distress in this patient group.

Regarding illicit substances, the results showed that differences in psychological distress were stronger for the dimensions of anger-hostility, somatic symptoms as well as depressive and obsessive compulsive symptom load. These findings show that patients with higher severity levels of illicit substance use experience negative emotions from several different groups of symptoms. It is possible that they thereby increase their substance use to reduce the impact of these symptoms. The increased substance use may further escalate the impact of these symptoms. The role of psychological distress in substance use is also a feature in relapse for substance use. Marlatt and Gordon (1985) argued that negative affect and emotional distress explain a large proportion of patients' relapse to substance use.

The Khantzian et al. (1974) version of the self-medication hypothesis, which asserted that patients use specific illicit substances to reduce specific symptoms, seems unlikely to be applicable being that the majority of patients in the present study were poly-substance users (60%). However, the results add indirect support to an alternative postulation to the self-medication hypothesis, which was termed the alleviation of dysphoria model (Mueser et al., 1998). This model argued that patients who have a high psychological symptom load become more vulnerable to excessive substance use. A general accumulation of psychological symptoms can result in an overall negative emotional state that the patients try to reduce by consumption of a variety of substances. On the other hand, the present study also showed that high severity levels of alcohol consumption was more strongly related to anxiety symptoms compared to other domains of psychological distress. This is in line with previous research that showed that patients with anxiety symptoms may prefer substances with sedative effects (Book & Randall, 2005). Laberg (1990) also argued that alcohol is often used as an anxiety-reducing countermeasure. However, these findings must be interpreted with caution because of the cross-sectional nature of the present study. Longitudinal studies are needed to examine whether changes in severity level of substance use result in changes in specific psychological symptoms and vice versa over time.

Contrary to the study's hypothesis, there were few differences in interpersonal problems related to severity level of illicit substance and alcohol consumption. Interpersonal problems may have a more indirect relation to substance use than psychological distress. This was supported in the structural model tested in paper II where interpersonal problems had indirect relations to substance use through increased psychological distress. Moreover, there were small differences in interpersonal problems among patients with high and low levels of substance consumption in previous studies carried out in general psychiatric health care (e.g. Dixon et al., 1991; Møller & Linaker, 2006). It should be pointed out that patients with high illicit substance use reported that they had greater tendency to manipulate and desire to control others during social interaction. More suspicion and egocentrism during social interaction were also reported by these patients. Patients with severe levels of alcohol use reported that they had more difficulty spending time alone and greater tendency to need much attention in social settings. This could indicate that severity levels of substance use relate to differences in these specific domains of interpersonal functioning.

Taken together, these findings have relevance for clinical practice in substance addiction treatment. Clinicians should pay close attention to patients who have recently experienced a negative significant life event, such as the death of a significant other, as this could increase the likelihood of substance use. As the findings suggest that there may be gender differences in how life events are interpreted and utilised, different clinical approaches may necessary for male and female patients: male patients may need more adaptive behavioural coping activities, such as hobbies, work and education, and female patients may need help facilitating social networks that provide protection and support. Empirical evidence supports the idea that social support and physical contact stimulate neurotransmitters with sedative properties in the brain (Taylor et al., 2000). This type of neural activity could reduce the likelihood of substance use. Meanwhile, the gender differences found in the present study should be regarded as general trends. There is probably substantial within group heterogeneity in how significant life events influence substance use among female and male patients. In addition, the differences between the invariant and nonvariant model reached significance on the .05 level, which indicates that the overall gender differences were modest.

Competence levels related to psychiatric disorders have been scant in treatment of substance use disorders and competence levels of substance use disorders have been scarce in general psychiatric health care (Kirkehei et al., 2008). Because the present results support psychosocial distress as a possible risk factor for substance use, it is likely that the patients would benefit from integrated parallel treatment of

psychiatric and substance use disorders. Therefore, competence levels regarding co-occurring psychiatric conditions in treatment of substance use disorders should be raised to similar levels as in general psychiatric health care (Landheim et al., 2002). Based on these ideas, contextual and psychosocial factors related to patients' perceptions of treatment and recovery processes were investigated in hopes that it would reveal relevant information about how patients perceive treatment processes that aim to alter factors such as psychological distress, substance use and relapse risk.

4.3. Psychosocial and contextual factors related to perceptions of treatment and recovery

An important line of argumentation in the present thesis is that patients with substance addiction experience challenges and obstacles within a variety of domains relevant to human functioning. Several quantitative studies have examined patients' perceptions of treatment and recovery processes using self-report questionnaires (Jørgensen et al., 2009; McLellan & Hunkeler, 1998). Fewer studies have examined such processes using semi-structured interviews, which delve deeper into the individual experience and perspective than do questionnaires. As a result of the complex composition of problem domains experienced by these patients, it was expected that the interviewed individuals would focus on a great variety of psychosocial and contextual factors when they expressed their opinions and experiences about contextual and psychosocial factors related to their treatment and recovery processes. The data patterns from the semi-structured interviews supported this and segmented into a fairly equal distribution of positive and negative statements about how the patients' experienced and perceived their treatment processes. This is in opposition to previous studies (e.g. Lovejoy et al., 1995) which found that patient perceptions of treatment processes were inflated in a positive direction. The discrepancy could be due to the fact that the present study included both patients who had completed their programme and patients who had prematurely dropped out of their programme.

It was hypothesised that the patients would focus on relatively common contextual and psychosocial factors across the treatment programmes (Asay & Lambert, 1999), and the results showed that one of the more influential factors for the patients was the quality of interpersonal relationships between patients and treatment personnel. Mutual support between patients within the clinical programme was also frequently focused on during the semi-structured interviews. This is in line with previous work, which showed that the therapeutic alliance and social relationships between patients are important for treatment persistence and

satisfaction (Asay & Lambert, 1999; Bacchus et al., 1999; Cooper-Patrick et al., 2002; Lovejoy et al., 1995). Specifically, the patients reflected on the importance of an available and attentive therapist. The patients also underlined that they preferred an understanding and non-confronting approach from the treatment personnel. An interesting implication of these results is that the capability to establish interpersonal relationships does not solely relate to the level of psychological distress and substance use experienced by patients. The capability to establish adequate interpersonal relationships is also significant for treatment persistence, motivation and progress.

Accordingly, studies showed that conflicts with the programmes' staff and motivational problems were more relevant for patients' subjective reasons for premature treatment dropout than their addiction-related symptoms (Ball et al., 2006). The authors suggested that clinicians and patients aim to establish common expectations of the treatment programme and client behaviour during the early phases of treatment. This may reduce interpersonal conflict between patients and therapists as well as premature client dropout. On the other hand, De Weert-Van Oene et al. (2001) found that the therapeutic relationship, operationalised by the helpfulness scale, predicted reduced retention in treatment. The researchers concluded that those who reported high perceived helpfulness from the therapeutic relationship might feel more confident about their own coping abilities. In the same study, the cooperation scale related to the therapeutic relationship predicted higher treatment retention, which perhaps means that patients with higher scores on this scale perceived that they were more dependent on their therapist and, thus, perceived that they had a lower ability to cope with their addiction-related challenges without help.

The interviewed patients suggested that staff-turnover was an obstacle for the establishment of adequate therapeutic alliances. Frequent replacement of treatment personnel caused considerable frustration because patients had to reintroduce their problems to and re-establish trust with the new therapists. Several informants said that they had experienced stagnation in their treatment progress because the therapy sessions were used to introduce, explain and elaborate their problem domains to new clinicians instead of learning coping strategies and establishing adaptive solutions to these problems. An implication of these results is that measures to reduce frequent staff turnover could aid the recovery processes of patients within a programme. Factors such as a good psychosocial working environment and competitive salaries for qualified personnel can serve to keep qualified staff and improve the conditions for change among the enrolled patients by offering them a stable environment. This is consistent with Jørgensen et al.

(2009) who found that patient satisfaction in psychiatric units was related to the atmosphere and the psychosocial work environment at the facilities.

In the present study the patients also related their treatment motivation to the social processes and ward atmosphere at the clinics. One of the more interesting tendencies in the interview material was that when patients had been tempted to prematurely dropout or relapse, they were often convinced to remain in treatment by other patients. On the other hand, the patients also elaborated on the negative impact fellow patients can have. Those who attended inpatient treatment with patients who received medically assisted treatment expressed dissatisfaction about the motivation and treatment persistence of patients who received opioid substitutes. In the semi-structured interviews, the interviewed patients explained that the clinicians were not persistent when they received resistance towards psychosocial activities from patients who received opioid substitutes. According to the interviewed patients, the perceived severity of opioid addiction combined with the traditional medical maintenance approach to this disorder partly became a reason for not including these patients in psychosocial clinical activities that were mandatory for the rest of the patients. Patients who did not receive methadone or buprenorphine as a part of their treatment reported that this influenced their motivation and the overall ward atmosphere in a negative direction. Clinicians should include patients who receive opioid substitutes in mandatory psychosocial activities in the programmes. It would be dysfunctional to replace one addictive substance (e.g. heroine) with an alternative addictive substance (e.g. methadone) without educating the patients in additional psychological coping strategies for their psychosocial challenges. An increased focus on implementation and common facility regulations for all patients in the programmes could potentially reduce out-group stereotyping and an overall negative effect on the ward atmosphere in clinics that combine medically assisted and psychosocial approaches to substance addiction treatment.

Overall, the patients considered consistent regulatory practice for all patients at the clinics important for their own motivation. Inconsistencies in practice of facility regulations were one of the more important negative factors in the present study. A potential cause could be that we included patients with premature service dropout in the interviews. These patients often argued that they had received unreasonable sanctions (e.g. dismissal from treatment) when they had lapsed or relapsed while in treatment. Several of these patients perceived dismissal as a punishment for revealing what they perceived as symptoms of their disorders during treatment and that it would not have happened to patients in traditional hospitals with more socially acceptable somatic diseases. Some of the patients who had been dismissed

because they used substances during treatment also reported that they had observed other patients who had done the same and received only a warning. The dismissed patients also asserted that the treatment facilities should look into alternative treatment for patients who relapse during treatment rather than merely exclude them from the programme and send them back to the conditions where their symptoms thrived. These results are in line with Bacchus et al. (1999) who also found that patients focused on treatment regulations when they expressed their opinions of inpatient treatment programmes.

Though the patients mainly focused on contextual and psychosocial factors related to social relationships, facility regulations and the ward atmosphere when they spoke of their perceptions of treatment processes, they also expressed opinions about therapeutic approaches and techniques. The patients had a positive view of the possibility to express their problems and challenges to others in similar situations during group therapy. Specifically, these patients reported that the other patients enrolled in the programme had more insight, experience and understanding of their situation than their family and friends. The patients found satisfaction in learning practical everyday routines such as cleaning, cooking and maintaining a regular sleep pattern.

However, dissatisfaction was reported by patients who thought that the match of their specific problems with the provided therapy was poor. Several patients, who attended therapy groups where coping strategies related to alcohol were discussed, were frustrated by the fact that underlying psychological problems were not on the agenda. These patients reported that their psychological problems were the main reason they used alcohol, and they had expected clinical countermeasures for these disorders when they entered treatment. This emphasises the need for sufficient competence and screening routines for co-occurring mental disorders in substance addiction treatment. Matching individual clinical problems with the right therapy at the clinics could also improve outcomes. This could be made possible by first identifying patient variables that predict different responses to different interventions. Clinicians could also screen for the treatment expectations of the patients and then develop individual plans for treatment that meets the expectations.

Meanwhile, there are reasons to be critical towards matching specific patients to specific treatment programmes. International randomised controlled studies have shown that matched patients do not necessarily have better outcomes than patients who received treatment-as-usual (Project MATCH Research Group, 1993). There may also be practical reasons for complications in matching patients to different treatment programmes. In Norway, for instance, the patients, to a large extent,

choose the clinical hospitals where they wish to be treated. Decisions regarding allocation of patients to specific treatment sites may also be governed by geographical availability, which may conflict with the suggestions derived from treatment matching instruments. In addition, the availability of specific treatment programmes is stymied by long waiting lists (Winters, 1999). Norwegian health regulations state that patients have a legal right to be enrolled in treatment within a specific timeframe, and matching a patient to a specific treatment may conflict with the timeframe. Moreover, it may be difficult to incorporate all the individual psychosocial, contextual and somatic variables relevant to substance use disorders into a specific matching instrument. According to McLellan et al. (1997), it might be more feasible and realistic to match patients to specific services and therapies within facilities that offer a variety of treatment and therapy approaches. In their study, the authors concluded that about 30% to 40% of the improved treatment outcomes were due to internal client-treatment matching within four different programmes (see also Gastfriend, 2003).

In regards to patients' perceptions of their recovery processes, the results from the semi-structured interviews showed that contextual factors related to economy, housing and employment are relevant for maintaining abstinence after treatment. Patients who returned to their former substance using network because they lacked private housing reported that they were continuously exposed to substances. This made it considerably more difficult for them to maintain abstinence. Patients also argued that financial debt significantly increased their temptation to relapse and questioned why the facilities did not focus on personal debt during treatment. On the other hand, several patients reported that they had established new social networks through their occupational activities and that these activities helped them focus on alternative activities to substance use. These findings are in line with the behavioural choice theory and also lend support to the findings from the proportional hazard model tested in the present thesis (paper I).

McIntosh and McKeganey (2000) showed that one of the more important social coping strategies for patients with substance use disorders was to avoid former friends and networks that used excessive amounts of substances. Myers and Brown (1990) found that peer pressure to continue use is a central cause of relapse among adolescents. The interviewed patients in the present study were relatively young and the results imply that the treatment facilities should intensify their collaboration with community services to establish housing that meets the needs of these patients. Nearly all the interviewed patients who had not received assistance and guidelines for housing during their treatment attributed later relapses to this. This was partly because they sought out substance using networks to find housing

and were thereby exposed to excessive substance use after treatment discharge. Guidelines and the establishment of housing, financial stability and employment could be mandatory components in treatment programmes for substance use disorders so that patients do not depend on their former substance use networks for these essential components.

Meanwhile, it should be noted, that several of the interviewed patients also reported that they missed their former networks and friends. McIntosh and McKeganey (2000) argued that there are important contingencies for the avoidance strategies to work. The first contingency is that it can be difficult to break ties with former substance using networks if the patient has friends who continue to use substances in an excessive manner and the patient wants to help them. This received support in our semi-structured interviews, as several patients said that they felt distressed by the continuous substance use in their former social network and did not want to end the friendships there because they wanted to help them reduce their consumption. The two other contingencies are related to the ability of the patients to establish alternative, new activities and a contextual framework (e.g. housing situation, job situation) that allows the substance using networks to be avoided. By providing guidelines for housing, finances, work and education activities, the treatment units can help set up the conditions necessary for avoidance. The treatment facilities could also aim to include the patients' social networks in treatment, which may provide them with insight into the patients' situation. Ultimately this could reduce peer pressure when the patients return to their everyday lives after treatment.

Another interesting finding from the semi-structured interviews was that the patients who had prematurely dropped out of their programme also reported substantial improvements in their substance use behaviours. These findings are in opposition to Stark (1992) who argued that patients with a premature service dropout had similar outcomes as untreated patients. Service users who had prematurely dropped out said that they experienced more control over their substance use during lapses after treatment. They also reported that they were more capable of re-establishing abstinence after substance use episodes than before treatment. Increased perception of control during a lapse may reduce the probability of a full relapse (Brownell et al., 1986). Although several other patients used substances after treatment, nearly all the individuals who participated in the semi-structured interviews reported improved insight into how to cope with their substance consumption. The patients mainly attributed these improvements to coping strategies regarding high risk situations that they had learnt in treatment. These results yield qualitative support to the effectiveness of the guidelines

suggested in the relapse-prevention model. This model has a psycho educational approach and aims to improve patients' self-efficacy regarding high risk situations for relapse. Because the relevance of contextual factors, such as housing and occupational activities, was emphasised in the semi-structured interviews, these findings support the idea that CRA approaches and the relapse-prevention model used together could be more effective in preventing relapse. Laudet et al. (2009) argued that when patients leave the treatment facilities they often have a strong desire to regain and make up for the time that they spent intoxicated. This could work in the favour of the patient if education, work training or regular occupation is established for them as countermeasures to avoid passivity and boredom post-treatment.

The results from the semi-structured interviews also indicated that patients experienced less psychological distress and interpersonal problems than before treatment was initiated. These improvements were manifested by increased self-confidence and capability to take part in everyday activities without turning their attention to substance use. These patients reported improved interpersonal relationships to significant others and improved ability to share their substance-related challenges with these individuals. Yet, some patients reported severe symptom load related to psychological disorders (e.g. depression, anxiety and schizophrenia) after treatment. These patients could probably benefit from integrated treatment for these disorders and/or regular outpatient psychiatric consultations after they have left the treatment facility for substance use disorders. A possibility is that increased collaborations and coordination of services between substance use disorder treatment facilities and psychiatric services in the communities could improve the psychological outcomes among patients with substance use disorders and co-occurring psychiatric diagnoses.

Notwithstanding that the patients generally considered both the treatment and recovery processes satisfactory, they also pointed out a number of improvement potentials that policy makers and programme developers could consider. The majority of these improvement potentials were related to psychosocial and contextual factors. The results from the semi-structured interviews showed that there are several common psychosocial and contextual factors across treatment programmes that could interact with the therapeutic interventions to influence patient outcomes. Future studies should measure these factors rather than investigate various treatment interventions and their associated outcomes in isolation because well-established treatment techniques and a philosophy that integrates these factors should underlie treatment programmes for substance use disorders. Future studies could also aim to incorporate the categories and themes

found in the semi-structured interviews into a more specific questionnaire suitable for studying perceptions of treatment and recovery processes in larger Norwegian patient samples. The study based on semi-structured interviews also provided a user perspective of how treatment and recovery processes can be adjusted to reduce the probability that patients relapse and use substances after treatment. The four empirical studies of the present thesis have shown the relevance of psychosocial and contextual factors for patient outcomes using quantitative and qualitative data. These factors seem to be highly influential for the patients' ability to initiate change and for the maintenance of the changes when they return to their everyday lives after treatment.

4.4. Methodological considerations

4.4.1. Sampling

The response rate of the survey was relatively low at the clinics (53%) and by mailed questionnaires (28%). A common misinterpretation of low response rates is that they necessarily result in invalid data. Low response rates are only problematic if they result in a sample that is not representative of the target population (Krosnick, 1999). As we do not have information about the non-responders, we approached the representativity issue by comparing information about central characteristics of the target patient population to our sample. The comparison illustrated only small differences between our sample and the relevant Norwegian patient population. The differences were mainly related to the number of stimulant users, employment rate, co-occurrence of mental disorders and number of individuals with social benefit as their main income. These differences could reflect local characteristics specific to the central region of Norway. Trondheim, which is the largest town in this region, has a relatively high number of amphetamine users. The central region in Norway also has more methadone users in regular employment compared to the capital, Oslo (Waal et al., 2009). However, our sample mainly resembles characteristics of samples in studies previously carried out in Norway (e.g. Landheim et al., 2003; Melberg et al., 2003). Furthermore, there were no substantial differences between the present sample and the population sample regarding gender, age, education, cohabitation status and housing status.

It was more challenging to implement the project in outpatient treatment facilities than in inpatient treatment centres. A reason could be that in outpatient treatment the patients were mainly available for recruitment during clinical consultations, whereas patients enrolled in inpatient treatment were available for

enquiries outside consultation hours. In addition, several of the outpatient facilities reported that many of the patients personally financed their clinical consultations. According to the coordinators, this made it difficult to dedicate parts of the therapy sessions to research-related activities. These issues were discussed in meetings with the coordinators throughout the project. During the meetings, it was suggested that the coordinators encourage the patients to complete the questionnaire directly before or after the clinical consultations. A solution where the coordinators partly delegated these tasks to other staff was also discussed, but was difficult to carry out in practice because the receptionists at the facilities were often on sick-leave and already had a heavy workload. These implementation issues probably reduced the response rates at the outpatient facilities.

Information about the type of treatment that the patients were enrolled in was not available in the aggregated population data. Consequently, it was not possible to examine how much the distributions in the present sample deviated from the population estimates. However, patients recruited by open-ended outpatient facilities constituted about 24% of the sample when patients who attended outpatient OMT were taken into account. The figures in Melberg et al. (2003) were 64% inpatients and 36% outpatients when OMT clinics were included. It is important to note that Melberg et al. (2003) sample was recruited in the urban south eastern area of Norway (Oslo region), and this area has more methadone users and OMT centres than other areas in Norway. Though the representativity of the present sample is considered satisfactory, it is noteworthy that the findings concerning the cross-sectional and strategic samples could be somewhat more relevant to inpatients than outpatients.

An additional reason for low response rates could be that there were several ongoing projects at the clinics when the study was carried out. The coordinators made clear that simultaneous participation in several research projects could reduce the time available for clinical interventions and activities, which may have resulted in resistance to recruit patients at some of the clinics. The coordinators have obligations and responsibilities related to both clinical activities and administrative tasks. This could have reduced their possibilities to follow the patient flow and recruit patients when they entered and left the facilities. Moreover, response rates are usually lower for mailed questionnaires compared to direct participation. Therefore, it was not surprising that the response rate was somewhat lower among patients who were outside the clinics and recruited by mailed questionnaires. In addition, these patients may have been intoxicated when they received the questionnaire, which could have made it difficult to respond to the enquiry.

One could argue that a random selection of patients would have increased the ecological validity of the sample. However, an important aim of the study was to include patients from different treatment modalities and programmes for substance use disorders. This approach increased the probability of obtaining a representative sample of patients with substance use disorders. Another aspect of this approach was to include several facilities that had not taken part in comprehensive research projects before, because it was believed that inclusion of these treatment units would improve the infrastructure and attitudes toward research at these facilities. This objective appears to have been reached as most of those units currently have their own development projects underway and have dedicated coordinators for research and development projects. The majority of facilities in the central region of Norway do not admit many patients over longer time periods. If a randomised procedure had been carried out, patients from these treatment facilities would probably become underrepresented in the study since the small sampling frame was small. In addition, a relatively high number of patients declined to participate in the study, and it is likely that this would have further reduced the sample size if a randomised procedure had selected specific patients to be included in the study. Therefore, a convenience sampling procedure aimed to recruit patients when they were admitted or discharged from the clinics was considered the more feasible method to establish an adequate sample size. The recruitment of patients on waiting lists and patients who had completed their treatment further increased the ecological validity and relevance for the target population.

The questionnaire was distributed to patients either before treatment, at the beginning of treatment, during the end of treatment or 3 to 12 months after discharge from treatment. This approach increased the probability of having different groups of patients represented in the sample and thus raised the ecological validity of the study. One may question whether scores on the measures of psychosocial functioning and substance use differed systematically between patients who were enrolled in treatment and individuals who did not attend a treatment programme. For instance, patients in treatment might be less likely to use substances and treatment might reduce patients' psychological symptom load. However, whether the patients were in a treatment context or not was controlled for as a covariate in paper III. The relation between substance use and psychosocial symptoms was substantial when this variable was controlled for. Moreover, relatively high scores on the GSI ($M = 1.92$) and IIP-C index ($M = 2.08$) were reported among patients who attended treatment. These patients had an average self-efficacy score of 3.42. In comparison, patients outside the treatment context (i.e. patients on waiting lists and those who had left treatment) had an average of

1.86 on the GSI and had an average IIP-C index score of 1.94. The average self-efficacy score was slightly higher among these patients ($M = 3.69$). Similarly, the average AUDIT score was 7.92 and the mean DAST-20 score was 2.99 among patients outside the treatment context. Patients in treatment had a mean of 7.52 on the Audit and an average of 2.51 on the DAST-20. Hence, patients enrolled in treatment also reported substance use and symptoms related to psychosocial distress. Several treatment units in the present study did not practice zero tolerance for substance consumption while patients attended the treatment programmes (i.e. patients were not necessarily dismissed from treatment if they used substances while enrolled in the programmes). In addition, the study included outpatients who were not treated in a controlled inpatient environment (24%). The scores of substance consumption among patients in treatment were probably increased by inpatients who used substances while attending the programmes and by patients who received outpatient services. Moreover, a high number of patients were recruited immediately when they entered treatment. The substance use scales thereby measured their severity levels of substance use the month before their treatment was initiated.

Regarding the representativity of the sample who participated in the semi-structured interviews, a differentiation could be seen between quantitative and qualitative representativity. Kuzel (1992) argued that the purpose of qualitative sampling is to illustrate the diversity within a population rather than strive for statistical representativity of a population. The main purpose of qualitative semi-structured interviews is usually not to generalise and obtain universal truths, but to establish description and understanding relevant to the specific individuals who are in the study (Maxwell, 1996). Thus, the aim of the semi-structured interviews was not to generalise the findings to patients outside the recruited sample, but to obtain unique and specific information about psychosocial and contextual factors relevant for how the interviewed patients perceived their treatment and recovery from substance use disorders.

The study based on semi-structured interviews used purposive sampling. We aimed to include patients who had attended treatment long enough to be able to express their substantial experiences and perceptions about their treatment. Patients with a longer treatment history are also more likely to have experienced both the positive and negative aspects of recovery. In addition, we aimed to include patients who tend to fail to respond to questionnaires and have a tendency to drop out of prospective outcome studies, namely patients who prematurely dropped out of their treatment programmes. This approach provided a more varied sample. Furthermore, the sampling was monitored to be balanced regarding gender,

educational level, age and treatment programme type. This probably increased the relevance of the data for clinical practice and reduced the potential of overgeneralisations. The purposive sampling made it possible to examine the diversity of perceptions and experiences about treatment and recovery processes among patients with substance use disorders.

Substance addiction treatment could be improved by adjusting treatment to individual problem domains and facilitating individualised treatment progress. Therefore, it is also of interest that we consider non-generalisable individual phenomena and use scientific methods suitable for investigating such phenomena in detail (Malterud, 2002). Consequently, both survey studies and semi-structured interviews could yield relevant information in research focused on patients with substance addiction. Future studies could increase the generality of the qualitative findings by triangulation of respondents and methods of analysis. An interesting approach would be to also interview clinical personnel and ask them which contextual and psychosocial factors they perceive as important for treatment and recovery processes among patients. Thereafter, comparisons could be carried out between the physicians' and patients' categories and themes related to these factors. Additional analyses by, for example, discourse analysis could yield more detailed information about individual experiences of treatment and recovery processes. This would also allow for examination of the correspondence and stability of the results across different methods of analysis. Studies to come could use a contextual content analytic approach for all interviews and thereafter subject a couple of the more interesting interviews to in-depth discourse analysis. Contextual content analysis is more robust when it comes to uncovering the manifest content (explicitly stated by the patient) in the interviews. Supplementary analysis by, for instance, discourse analysis could yield more insights into the latent content (implicitly stated by the patient).

4.4.2. Causality

When the data from the survey were analysed, statistical tests such as SEM analysis and regression analysis were performed. Statistical terms such as 'predictor variables', 'explained variance' and 'risk factors' are also used throughout the thesis. This does not imply that the findings can be interpreted as causal relations¹. A longitudinal or experimental design would have been used if

¹ Mill (1872) stressed a positivistic approach to causal inferences consisting of two preconditions; (1) the effect should operate every time the cause is present and (2) the effect should be absent when the cause is not present. According to him, inferences about causality could be undertaken when these conditions are met because

such relations were to be tested in the present study. However, causal notions are usually easier to test and may have more applicability when the studied system has a closed nature with few variables in operation. In order to carry out controlled experiments it must be possible to manipulate the relevant independent variables. These conditions are more often met in the natural sciences than in the social sciences (Ringdal, 1987). Moreover, Cook and Campbell (1986) argued that experiments which include randomisation routines cannot be expected to exclude all alternative interpretations or rival hypotheses.

Among patients with substance addiction several issues arise related to the establishment of adequate experimental randomised controlled studies. A precondition of these designs is that patients who accept randomisation do not systematically differ from those who refuse randomisation. Several studies have shown that patients with substance addiction who accept randomisation of treatment services often have lower psychosocial functioning and less social resources than patients who refuse such randomisation (Finney et al., 1996; Kissin et al., 1970). Hence, the patients who are recruited to these studies may not adequately reflect the relevant clinical population. Another objection to these designs being used in substance addiction treatment research is that it is often difficult to manipulate the relevant independent variables. Relevant to the present study, it is both practically and ethically complicated to manipulate variables such as age, employment, life events and interpersonal problems. Nevertheless, it is also interesting to investigate how such variables relate to substance use and relapse among patients with substance use disorders rather than merely considering these variables as 'noise' or 'confounders' to be controlled out by randomisation.

Moreover, patients with substance addiction often have co-occurring psychiatric disorders (Grant et al., 2004; Landheim et al., 2002). An experimental design is more valid when the patients meet the criteria of one medical condition or

alternative interpretations are ruled out. Skog (2004) asserted that criteria about causality could be divided into three components: (1) Asymmetry (the cause should be present before the effect in time), (2) locality (the effect should be present close to the cause in time), and (3) constant conjunction (every time the cause is present, the effect should unfold). However, Hume (1711-1776) argued that statements about causality are simply rooted in events that are subjectively interpreted as united by human beings. For instance, when drawing an inference that A causes B we simply observe that B follows A in a regular pattern. According to Hume it is a fallacy to conclude that, for instance, psychological distress produces substance use on the basis of observing that one event follows after another event in time. He reasoned that if a consistent connection exists between these concepts there should be an agent that binds them together. According to the logic of Hume causality does not exist in the objects themselves, but rather as interpretations and habits of thought among human beings.

disorder (Gossop, 2002; Gullestad, 2003; Hagen, 2009). The more comprehensive RCT studies carried out in substance addiction treatment, namely the UK Alcohol Treatment Trial (UKATT), Project MATCH and the Pharmacotherapies and Behavioral Intervention Study, excluded patients with co-occurring mental disorders. This probably reduced the relevance and applicability of the results for clinical practice (Sellman, 2009) because an important patient group was excluded. Large-scale RCT studies that successfully include this patient group and investigate substantially different programs should be carried out. A limitation of the Project MATCH and UKATT was that the therapies and clients that were included were relatively similar (Ravndal, 1999).

The present study does not yield information about the relative influence of specific treatment interventions (e.g. 12-step programmes, therapeutic community) compared to contextual and psychosocial variables on relapse and substance use. This is an important domain to investigate, and an evaluation study based on the RCT method may yield information about the relative influence of treatment on relapse and substance use outcomes. In addition to the above-mentioned challenges related to randomisation, the treatment facilities in central Norway enrol few new patients over time, and it is therefore challenging to establish sufficient statistical power using such research designs. RCT studies are also resource demanding to carry out because research personnel must follow the patient flow (i.e. when patients enter and leave treatment) accurately and assign the respondents to the appropriate interventions. We did not have the resources to exempt the research coordinators from other duties at the clinics or compensate the research facilities for reduced staff capacity during the study. In addition, some of the treatment centres used a relatively high number of treatment interventions, and these interventions are often adjusted to the individual patients. For instance, a previous development project carried out in the therapeutic community, which was included in the present study, revealed that the facility regularly used between 190 and 240 interventions for females and males, respectively (Nordfjærn & Stallvik, 2009). This complicates the operationalisations of the interventions in RCT studies. As a result of the challenges related to randomisation, statistical power and operationalisations of interventions, it was considered too complicated and resource demanding to carry out a RCT study as part of the present thesis.

Outcome variables such as substance use, time from treatment discharge to relapse and perceptions of treatment and recovery processes usually have a multitude of potential causes. In order to narrow down the causal agents of these outcomes, it would be necessary to control for all the potential variables that could cause differences in these outcome variables. In spite of the fact that a high number

of relevant variables were controlled for as covariates in the present studies, the included covariates probably adjust for a small part of the variables with potential causal links to relapse, substance use and psychosocial distress. A feasible approach to further tests of such casual notions would be to follow the respondents over an extended period of time in prospective investigations. This would allow for investigation into the temporal ordering of the relationships and examination of whether changes in the predictor variables influenced the outcome variables over time. Such methodological approaches are congruent with one of the more central ideas in Hill's (1965) preconditions for causal inferences. Temporal ordering is especially relevant for disorders such as substance addiction and psychological disorders because these disorders often develop in concert over a longer temporal period (Hüsler & Plancherel, 2008). Independent of the chosen research design, however, it is difficult to draw strong causal inferences about the variables tested in the present study. If there was a necessary causal binding between, for instance, negative life events, psychological distress and substance use all people should use substances each time they were confronted with negative life events and psychological distress. Hence, patients' diathesis, predispositions and resilience factors are likely moderators of such causal relations. An improved understanding of causal mechanisms in the social sciences could also be obtained if intentions, motivation, habits and choices are taken into consideration when investigating behaviours such as substance addiction (Skog, 2004).

Moreover, a casual connection between predictor and outcome variables cannot be present if correlations are not found between the variables (Mill, 1872; Møller & Linaker, 2006). Although it is important to carry out longitudinal investigations related to the factors investigated in the present study, such designs are resource demanding and are vulnerable to self-selection as patients who have successful progress over time may be more likely to stay in the studies (Hubbard et al., 2003). This represents a potential problem for both the statistical power and the ecological validity of the results. This relates to one of Hill's (1965) criteria for causality, namely the consistency of the observed associations. According to this criterion the associations between variables should be consistently demonstrated among different individuals, who have different locations at different times if valid inferences about causality are to be drawn. Researchers should establish extensive follow-up and locator routines before carrying out longitudinal studies that are aimed at examining factors related to relapse, substance use and perceptions of treatment and recovery processes.

Structural equation modelling and regression modelling have been established as methods for investigating causal assumptions in the social sciences. This does

not necessarily imply, however, that valid interpretations of causality can be drawn from such statistical investigations. Alternative competing models consistent with the data cannot be ruled out simply because a model is found to have good fit. Moreover, the clinical realities are complex and we cannot expect to capture all factors related to processes such as relapse and substance use with theoretical models. However, a substantial proportion of variance in the criterion variables was explained by the predictors in the SEM models in the present study. Thus, a small proportion of the explained variance in the relevant criterion variables was left to the error terms. The Cox regression model also revealed good correspondence between the model and the empirical data. Cook and Campbell (1986) argued that researchers in the social sciences often assert causal assumption that cannot be tested within a strictly positivistic experimental paradigm. Assumptions about causality should be based on considerations regarding research methods, empirical data and theory. The findings in the present study indicate good correspondence between the theoretical presumptions about causality and the empirical data.

4.4.3. Measurements and operational definitions

Construct validity is one of the more important criteria for validity in survey investigations. This puts demands on the definitions and precision in the measurement instruments. Most of the measurement instruments in the applied questionnaire have been validated in previous work among patients with substance addiction. Two exceptions were the measures of relapse and life events. The measure of relapse utilised a consequence definition of this concept. Explicitly, this means that the patients were asked about the time interval from treatment discharge until their substance use increased to a level where the patients began to consider more treatment necessary. No formal validated standard exists regarding retrospective operational definitions of relapse. There is substantial disagreement in the literature about how to operationally define the required severity level to fulfil the criteria for relapse. A relapse could, for instance, be defined as any substance use after treatment or, alternatively, as a pattern of substance use episodes which could indicate the patient had reinitiated persistent substance use (Alemi et al., 2004). Maisto et al. (2003) found that different operational definitions of relapse could result in self-reported variations in the time interval between treatment discharge and a relapse. One could argue that the measure of relapse in the present study was too strictly operationalised because the patients may use substances in excessive patterns for longer periods without considering a new treatment necessary. The use of the strictest definition of relapse in Maisto et al. (2003) (i.e.

at least one heavy drinking day with associated problems following four abstinent days) caused the patients to report a median of 90 days until a relapse occurred. However, this finding was not supported in the present data. The median days to relapse in the present study were 21 days. An aim of the present definition of relapse was to avoid patients considering relapses as analogous to smaller incidents of substance use (i.e. lapses). Therefore, a definition where any drinking or substance use could be interpreted as a relapse was considered inadequate. Moreover, a conceptualisation where the patients consider treatment readmission because of increased substance use has been supported elsewhere (Rosenberg, 1983). Mortensen and Eaton (1994) also utilised a similar understanding of relapse in regards to schizophrenia. More recent studies have also applied similar operational measures of relapse to substance use with feasible results (Hammerbacher & Lyvers, 2006).

Relapses were measured retrospectively in the present study. Though it is questionable whether the patients were able to accurately remember their most recent relapse, the relapse rates in the present study are likely to be accurate as they are similar to those in previous longitudinal studies (Gossop et al., 2002; Xie et al., 2005). In addition, the median number of days between the most recent treatment programmes associated with relapses and the data collection was 425 days. Cognitive distortions and memory problems are common among patients with substance addiction. However, it is probable that the patients remembered their most recent relapse relatively accurately, especially when considering the relatively short period between the treatment for patients' relapse and the time of measurement. The majority of patients had also undergone detoxification before they were introduced to the questionnaire. Detoxification may have improved their ability to recall these events compared to their state immediately after the relapse when the patients were more likely to be intoxicated (Hammerbacher & Lyvers, 2006).

Previously validated measures of life events were not used in the present study because these instruments tend to predefine the characteristics of significant life events. These instruments also have a set list of events which may not be relevant to the specific individuals. A possible strength of the present study was that the patients defined the relevant life events and whether these events had positive or negative impact on their situation. A potential weakness was that we did not differentiate the life events using weighting of life events, which could, for instance, allow us to compare the impact on psychological distress of death among significant others compared to an individual overdose. This is a complicated approach because it is difficult to quantify the importance of different life events

(for a discussion see Biafora Jr et al., 1994) and grade their impact on the overall life situation of the individuals. In addition, the impact of positive and negative life events can interact and cancel each other out, as happens when the negative impact of the death of a beloved person can be partly reduced by the positive effect of the social support received after this event. Previous research has also demonstrated that the predictive power does not increase by the weighting of life events (Ross & Mirowsky, 1979 cited in Biafora Jr et al., 1994). However, future studies could ask the patients to report the relative positive and negative impact of life events on a bipolar scale. Within the framework of the outlined limitations, this would allow the researchers to examine whether specific life events have different relations to psychological distress, self-efficacy and substance use. Studies based on semi-structured interviews may also shed more light on how different life events relate to mental health and substance use behaviours.

Some of the challenges experienced from using qualitative coding with contextual content analysis should be discussed. A distinction between positive and negative perception was chosen before coding. In some instances, it was difficult to differentiate the statements into positive or negative categories. In these cases, the audio tapes were consulted. When it was considered too difficult to assign codes to these statements, they were excluded from analysis. It cannot be ruled out that relevant information was lost as a result of this procedure. However, the majority of sentences were possible to distinguish into these categories, and few sentences were excluded due to the positive/negative distinction. This segmentation was an overall strength of the analysis because it allowed us to investigate contradictory information in detail.

Another challenge of the coding procedure was related to a few overlapping categories. At times it was difficult to separate statements regarding social relationships between people at the clinics and specific treatment approaches and interventions. This applies particularly to interviews of patients who had received treatment in a therapeutic community where the close social structure at these clinics constitutes an important aspect of the treatment method (DeLeon, 1985). The research group was aware of the nature of this challenge when the data collection was carried out. The interviewers were supervised to ask the patients whether the social processes were directly related to the therapeutic approaches, such as group therapy or social interventions in the programme, or related to social relationships established relatively independent of specific treatment interventions. Similar challenges and solutions are also discussed elsewhere (see e.g. Orford et al., 2009). It is probable, however, that continuous discussions with other researchers improved the validity of the categories and codes applied to the

counting units. The inter-rater coding reliability was also found to be acceptable ($\kappa = .43$). According to Yardley (2000), a strictly pre-defined coding procedure may not be desirable because it could make the researcher less attentive to the context of statements. Intuitive interpretations and coding by the researcher are important aspects of contextual content analysis.

4.4.4. Self-reported data

The majority of findings in the present thesis relied on self-reported data of sensitive information. Survey questionnaires and semi-structured interviews are two of several possible methods used to study aspects of human functioning such as substance use behaviours and psychosocial distress. Structured interviews or ethnographical approaches are examples of alternative methods. Questionnaires and semi-structured interviews were considered feasible methods for the present study because this approach reaches many patients in a cost effective and time efficient way.

It was taken into consideration that the data quality could be improved were we to collect information from urine tests and patient journals. However, previous studies have shown that self-reported measures of substance use corresponded with information from urine tests and significant others (Secades-Villa & Fernandez-Hermida, 2003). Simpson et al. (2002) also demonstrated that self-reported substance use correlated with biological tests such as urine tests and hair samples. Friedman et al. (2004) statistically controlled for social desirability when the relations between self-reported substance use and psychological distress were examined. The relations achieved significance when social desirability was taken into account.

Moreover, the majority of the applied measurement instruments has been tested and validated in previous work. These instruments have been shown to have satisfactory psychometric properties among patients with substance addiction. Another rebuttal against low data quality is that patients in clinical settings receive numerous enquiries regarding their mental health and substance use during clinical therapy. We were impressed by the patients' candour during the semi-structured interviews. It is possible that on account of similar consultations regarding their mental health and substance use, the patients had become partly desensitised to presenting these problems to other people. Their openness and honesty regarding their disorders are likely to be therapeutically useful to the patients. In closing, the author of the present thesis argues that researchers and clinicians should move beyond the interpretation that information obtained from patients who have manifested substance use disorders is unreliable and invalid. These patients are a

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wealth of information: they are the experts in how they have lived with substance addiction, how they are influenced by treatment and what it is like for them to live in society post treatment. Consequently, the self-report nature of the data was not considered problematic for the data quality.

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Relapse Patterns among Patients with Substance Use Disorders

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Relapse Patterns among Patients with Substance Use Disorders

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Abstract

The aim of the study was to examine the time interval from treatment to relapse among patients with substance addiction. Some of the risk factors related to this interval were investigated. The sample ($N = 352$) was recruited from 16 substance addiction treatment facilities in four Norwegian counties. The respondents replied to a questionnaire either at waiting lists, when starting treatment, upon treatment completion or 3 to 12 months after treatment. Among these respondents, 160 patients had experienced a relapse after their prior treatment. Cox regression models showed that the relapse risk peaked during the first months after treatment. Older and employed patients had lower probabilities of early relapses. Patients who had an addiction pattern dominated by opioids or alcohol had higher probabilities of early relapses. Inpatient treatment of short and long durability was associated with a longer time interval from treatment to relapse. Aftercare should be intensified during the first months after treatment. Treatment follow-up should be individually differentiated and target patients with higher risk of relapse. Interventions could aim to target adolescents and facilitate occupational activities for the patients before they leave the facilities.

Key words: relapse pattern, psychological, Norwegian, substance addiction, patients

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**Interrelations between Patients' Personal
Life Events, Psychosocial Distress and
Substance Use**

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Interrelations between Patients' Personal Life Events, Psychosocial Distress and Substance Use

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Abstract

This study investigated interrelations between life events, psychosocial distress, self-efficacy and substance use among patients manifesting substance use disorders. Gender differences in these interrelations were also explored. Patients ($N = 352$) were recruited during 2008 and 2009 from 16 Norwegian facilities. These patients completed a questionnaire with validated measurement instruments. Interrelations were investigated by SEM analysis. The results suggested that negative life events facilitated substance use and psychological distress. Positive life events were associated with self-efficacy, but weakly related to substance use. The results supported the notion that males are more prone to use substances when faced upon negative life events.

Key words: Life events, interpersonal problems, psychological distress, self-efficacy, gender, substance addiction

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**Do Severity Levels of Substance Use
Relate to Self-Reported Variations in
Psychosocial Distress?**

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Do Severity Levels of Substance Use Relate to Self-Reported Variations in Psychosocial Distress?

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Abstract

This study aimed to examine whether patients who reported different severity levels of illicit substance use or alcohol differed in contemporary psychological distress and interpersonal problems. A patient sample ($N = 352$) was established from 16 treatment facilities for substance use disorders in Norway and by mailed questionnaires to patients at waiting lists and individuals who had completed their treatment. The response rates were 53% and 28% for data collected at the clinics and by mailed questionnaires, respectively. The questionnaire consisted of validated measures of substance use and the psychological constructs. The results showed stronger symptom load in the groups manifesting severe levels of illicit substance use and alcohol consumption. For illicit substances these differences were stronger for symptoms related to depression and somatic issues, whereas differences were more substantial in anxiety symptoms related to alcohol consumption. Differences in interpersonal problems were marginal both for illicit substance use and alcohol. The results indicate that psychological distress is more directly associated with substance use than interpersonal problems. The role of interpersonal problems for substance consumption may be of a more indirect character than the connection between psychological distress and substance use.

Key words: level, substance use, patients, psychological distress, interpersonal problem

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Treatment and Recovery as Perceived by Patients with Substance Addiction

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Treatment and Recovery as Perceived by Patients with Substance Addiction

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Abstract

Research concerning patients with substance addiction and how they perceive their treatment remains scant. The objective of this study was therefore to examine positive and negative perceptions of treatment and recovery from the perspectives of these patients. Data were collected with semi-structured interviews among seven patients who completed treatment and six patients who prematurely dropped out from their programme ($N = 13$). Patients were strategically sampled from five inpatient facilities and one outpatient opioid maintenance treatment clinic located in two Norwegian counties. All interviews were transcribed and thereafter analysed with contextual content analysis aided by the QSR NVIVO 8.0 software. This was carried out to obtain information about the manifest positive and negative content in the interviews. The results showed that the therapeutic alliance and mutual influences among patients were important for perceptions of treatment. Frequent staff turnover also related to these perceptions. The more important domains of recovery were psychosocial functioning and substance use. The implications of the results were discussed in relation to clinical practice and further research.

Key words: substance addiction; perception; treatment; recovery; qualitative method

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