# SOS

Improving awareness, understanding, and prevention of victimization among dual diagnosis patients

Marleen de Waal

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**Marleen de Waal**

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# SOS

## Improving awareness, understanding, and prevention of victimization among dual diagnosis patients

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# Chapter 1

## General introduction

# Introduction

Sexual intimidation, death threats, and bicycle theft. These are the crimes that I have personally been a victim of. What about yourself? Almost everyone has somehow been affected by crime victimization and experienced its impact. However, some are at higher risk to be victimized compared to others. Particularly vulnerable to crime victimization are individuals who suffer from mental illness and substance use problems. This disturbing, but understudied phenomenon deserves more attention from scientists and clinicians.

A countless number of times over the past five years I have had to explain - and repeat - that my PhD thesis was not about dual diagnosis patients as perpetrators of crime, but as victims. Besides, in the scientific literature, there is much less emphasis on victimization among people with mental illness compared to criminal offending. Moreover, in clinical practice, victimization is often overlooked. In 2013, I was able to visit the International Conference on Violence in Psychiatry as a fresh PhD student. I was perplexed to see that out of over a hundred speakers, I was the sole person to present on violence directed towards patients, instead of violence directed towards staff.

When the current research was designed in 2013, as part of the program *Violence Against Psychiatric Patients*, established by the Dutch Organization of Scientific Research (NWO) in collaboration with Stichting tot Steun VCVGZ, very little was known about victimization among individuals with dual diagnosis: a co-occurring substance use disorder and other mental disorder. It seemed highly valuable to me to study this unexplored topic in this complex patient group, to develop an intervention to reduce patients' vulnerability to victimization, and to evaluate its efficacy in a randomized clinical trial. The novelty of this topic provided us with ample opportunities, but also raised multiple questions and challenges. What kind of incidents do dual diagnosis patients experience? What makes them vulnerable to victimization? What sort of skills should be addressed? How do we develop an intervention for such an unexplored phenomenon?

**Dual diagnosis**

In the United States, 43.3% of adults with a past year substance use disorder also met criteria for another mental disorder in 2016 (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). Vice versa, 18.5% of adults with a past year mental disorder also met criteria for a substance use disorder (SAMHSA, 2017). Among these individuals with *co-occurring disorders* or *dual diagnosis*, prevalent mental

disorders are mood disorders, anxiety disorders, psychotic disorders, personality disorders, and attention-deficit/hyperactivity disorder (Dom & Moggi, 2015; National Institute on Drug Abuse, 2018). Although causality and even directionality are difficult to establish, three scenarios probably contribute to the prevalence of dual diagnosis: substance use problems can lead to the development of another mental illness, mental illness can lead to substance use as a form of self-medication, and both substance use problems and other mental disorders can be caused by overlapping contributing factors, such as genetic vulnerabilities and early exposure to trauma (Dom & Moggi, 2015).

**Dual diagnosis treatment**

Most individuals with dual diagnosis do not seek substance use disorder treatment (SAMHSA, 2017). Dual diagnosis patients who do receive treatment experience more treatment resistance, worse clinical outcomes, and increased relapse rates compared to those with substance use disorders alone (Hunt, Siegfried, Morley, Sitharthan, & Cleary, 2013; Kavanagh, Mueser, & Baker, 2003; Kessler, 2004). Evidence-based psychological interventions for these patients are scarce. Unfortunately, patients with substance use disorders are usually excluded from participating in clinical trials examining psychological interventions for mental disorders (Leeman et al., 2017). Vice versa, patients with psychiatric problems are often excluded from trials studying interventions in substance use disorder patients (Moberg & Humphreys, 2017). Many of the clinical trials that have been conducted in dual diagnosis populations have faced considerable methodological challenges, which is illustrated by a 2013 Cochrane Review summarizing evidence for the effectiveness of psychosocial interventions for patients with severe mental illness and substance use problems (Hunt et al., 2013). The authors reported that out of the 32 studies that had been conducted, only 14 studies involved more than 100 participants and only two involved more than 200 participants. The majority of the reviewed studies had considerable methodological shortcomings, such as high drop-out rates, an unclear description of the randomization process, and a high or unclear risk of bias. Hence, high-quality trials are urgently needed to improve treatment outcomes for patients with dual diagnosis.

**Victimization**

Each year, around three million of the 17 million inhabitants of the Netherlands are a victim of crime (Akkermans, Coumans, Kloosterman, Linden, & Moons, 2014; Wittebrood, 2006). Although property crimes and vandalism are most prevalent, yearly, around 500.000 inhabitants are victims of interpersonal violence. Since the 1970s, there is an international tradition of measuring crime victimization based on self-report questionnaires. This has provided us with increasingly accurate and detailed insight

in the prevalence and characteristics of crimes, especially with regard to crimes that were not reported to the police (Wittebrood, 2006). In this thesis, with *crime*, we mean all misdemeanor or felony offenses that are punishable by law. It does not include infractions such as littering, disturbing the peace, or drinking in public. Furthermore, we confine ourselves to *interpersonal* crimes between individuals, and therefore do not include offenses against the state and public-order crimes, such as tax fraud, driving under the influence, and illegal possession of weapons or drugs. The crimes we do consider include violent crimes (e.g. physical assault, sexual abuse), property crimes (e.g. burglary, theft), and vandalism: intentional damage of private property.

**Victimization among people with mental disorders**

Since the late 1990s, studies have consistently shown that rates of criminal victimization among individuals with severe mental illness are higher compared to rates of criminal victimization among other members of the general population (see Maniglio, 2009b, for a review). People with substance use disorders are at increased risk of being victimized as well (Meijwaard et al., 2015; Stevens et al., 2007; Vaughn et al., 2010). Although ample studies have demonstrated the increased rates of victimization in patients with mental disorders, little is known about risk factors, characteristics, and consequences of victimization for individuals with mental disorders. A study by Sells, Rowe, Fisk, and Davidson (2003) indicated that people with dual diagnosis are even more likely to be violently victimized compared to those with either a psychiatric disorder or substance use disorder only. Prior to the current thesis, determinants and characteristics of victimization had never been examined among individuals with dual diagnosis. In addition, it was unclear whether the *victim-offender overlap* that has been observed in other populations (e.g. Johnson et al., 2016; Maniglio, 2009b; Neale, Bloor, & Weir, 2005) is present in the dual diagnosis population as well.

**Prevention of victimization**

There were no evidence-based interventions available to reduce vulnerability to victimization of patients with mental disorders, although researchers had pleaded for the development of interventions for over a decade (e.g. Perese, 2007a; Teplin, McClelland, Abram, & Weiner, 2005). The major aim of the current project was to develop an intervention to prevent victimization in dual diagnosis patients and to evaluate its efficacy in a randomized controlled trial.

The most widely used criminological approach to explain differences in vulnerability to crime victimization is the routine activity theory, as first described by Cohen & Felson (1979). Routine activity theory states that crimes are likely to occur when three elements are present: a motivated offender, an attractive target, and the absence of

capable guardianship. The theory implies that potential victims can lower their risk of victimization if they are able to reduce their attractiveness as a target. Research has indicated that individuals with a history of victimization are more prone to future victimization (e.g. Christ et al., 2019; Roodman & Clum, 2001). However, underlying mechanisms are yet unclear. Although we can derive insights from criminology research, there is no comprehensive empirical basis to understand why certain individuals experience more *victim proneness* compared to others. In order to develop preventive interventions it is of utmost importance to identify potentially changeable factors related to victim proneness. The risk factors for victimization that have previously been established in patient populations are either hard to change (e.g. age, gender, living situation), or inherent to patients' illness (e.g. psychiatric distress, substance use problems) (Maniglio, 2009b; Neale et al., 2005; Stevens et al., 2007). Hence, it was yet uncertain which skills should be trained in order to successfully reduce the proneness of dual diagnosis patients as victims of crime, and potential targets for intervention had to be derived from other populations. It has been suggested that violent victimization may be related to psychological vulnerabilities, such as interpersonal problems (Stepp, Smith, Morse, Hallquist, & Pilkonis, 2012) and emotion regulation difficulties (Messman-Moore, Ward, & Zerubavel, 2013), especially in women.

**Victimization in female college students**

Several studies in college samples reported that dysfunctional emotion regulation is associated with both a history of sexual victimization and sexual revictimization (Carlson & Duckworth, 2016; Marx, Heidt, & Gold, 2005; Messman-Moore et al., 2013). Additionally, it has been suggested that women with a history of sexual victimization have a decreased ability to perceive risk in a potentially threatening situation (see Gidycz, McNamara, & Edwards, 2006, for a review). Marx et al. (2005) theorized that childhood sexual abuse elicits emotion regulation difficulties, and that these difficulties may in turn impair one's ability to recognize risk cues, thereby increasing one's vulnerability to future victimization. The aforementioned limited theoretical framework on psychological mechanisms underlying risk of victimization sparked my interest during the first phase of my PhD research project. To further contribute to the theoretical framework needed for the development and refinement of interventions, we set up an additional study in female college students in collaboration with prof. dr. Dekker of the VU University, Amsterdam, the Netherlands, and prof. dr. Messman-Moore of the Miami University, Oxford, Ohio, United States. In this study we aimed to examine hypothesized associations between impaired risk perception, emotion regulation difficulties, and sexual victimization, building on previous findings in a US college sample (Walsh, DiLillo, & Messman-Moore, 2012). In addition, childhood victimization has been suggested to increase the risk for revictimization (Christ et

al., 2019; Roodman & Clum, 2001), although underlying mechanisms are unclear. Our supplementary study in female college students provided us with the opportunity to expand on the impact of different types of childhood abuse on depressive symptoms, interpersonal problems, and emotion regulation difficulties in adulthood.

## Aims and outline of this thesis

In **Part I**, we describe our findings with regard to the prevalence, characteristics and associated factors of victimization and offending in dual diagnosis patients. We hypothesized that dual diagnosis patients would be more likely to be victims of crime compared to the general population, and that victimization would be associated with psychiatric symptom severity, substance use problems, and offending within this patient group.

In **Part II**, we outline the study protocol of the randomized clinical trial and report on the efficacy of the Self-wise, Other-wise, Streetwise (SOS) training: a newly developed intervention to prevent victimization in dual diagnosis patients. We hypothesized that adding the SOS training to care as usual would be more effective in preventing victimization compared to care as usual alone.

In **Part III**, we describe our findings regarding the relationship between sexual victimization, risk perception, and emotion regulation in female college students, and the impact of three types of childhood abuse on depressive symptoms in this population. We hypothesized that sexual victimization would be associated with emotion regulation difficulties and impaired risk perception. In addition, we hypothesized that childhood emotional abuse would be associated with depressive symptoms and that this relationship would be mediated by emotion dysregulation and interpersonal problems.

In **Part IV** we summarize our findings, discuss them in the context of the literature, and consider their implications for future research and clinical practice.

# Part I

# Victimization and offending in dual diagnosis patients

# Chapter 2

## Prevalence of victimization in patients with dual diagnosis

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# Abstract

**Objective:** The purpose of this study was to determine the prevalence of victimization in patients with co-occurring mental health and substance use disorders (dual diagnosis) and compare them to the general population.

**Methods:** In this cross-sectional survey study conducted in the Netherlands, 9 different types of victimization (e.g. physical assault) were assessed with the Safety Monitor in patients with dual diagnosis (*N* = 243) and a sample of the general population (*N* = 10865). Chi-square tests were used to compare patients with a weighted sample of the general population.

**Results:** Compared to the general population, patients with dual diagnosis were more likely to have been a victim of violence (60% vs. 11%), property crime (58% vs. 30%) and vandalism (21% vs. 14%) in the year preceding the assessment. Threats, sexual assault, physical assault, robbery, bicycle theft, other theft, and vandalism were more prevalent in patients with dual diagnosis compared to the general population. Car theft was more prevalent in the general population. The risk of burglary did not differ significantly between groups.

**Conclusions:** Patients with dual diagnosis are highly prone to victimization. In patients with severe mental illness, victimization is associated with psychopathology, substance use, homelessness, and engagement in criminal activity. Future research is necessary to explore underlying mechanisms in patients with dual diagnosis and develop interventions to reduce their vulnerability for victimization.

# Introduction

Patients with psychiatric disorders are more likely to be victims of crime compared to the general population (see Maniglio, 2009b, for a review). A large study conducted in the United States (Teplin et al., 2005) reported past-year rates of violent victimization (e.g. physical assault) of 25% in patients with severe mental illness compared to 3% of the general population. Property victimization (e.g. theft) was reported in 28% of the patients with severe mental illness compared to 8% of the general population. Patients with substance use disorders from four European countries (Stevens et al., 2007) reported past-year rates of 42% violent victimization and 48% property victimization. Victimization is associated with more severe symptomatology, homelessness, substance use, more psychiatric hospitalizations and engagement in criminal activity (Maniglio, 2009b).

Approximately 50% of patients with a substance use disorder has a co-occurring mental disorder (Kessler et al., 1996). The prevalence of co-occurring substance use and mental disorders is 3.3% in the general US population (SAMHSA, 2015). These patients with dual diagnosis have more severe and persistent symptoms (Kessler, 2004), are more often homeless (Drake, Osher, & Wallach, 1991) and experience treatment resistance (Hunt et al., 2013; Kessler, 2004). Patients with dual diagnosis may be even more prone to victimization than patients with a severe mental illness or substance use disorder only (Havassy & Mericle, 2013; Sells et al., 2003). However, research on victimization in this patient group is very limited.

Most studies in patients with psychiatric disorders examine either violent victimization or total victimization, without distinguishing between different types of crimes. We aim to indicate the prevalence of 9 different types of crime victimization in patients with dual diagnosis and compare them to a weighed sample of the general population. In accordance with studies conducted in patients with severe mental illness and patients with substance use disorders, we expect that victimization rates in patients with dual diagnosis are higher compared to the general population. This cross-sectional survey study is the first to compare the prevalence of victimization in patients with dual diagnosis to the general population.

# Methods

### Design

This cross-sectional study utilized baseline data from a randomized controlled trial designed to determine the effectiveness of a new intervention that aims to reduce victimization in patients with dual diagnosis (de Waal, Kikkert, Blankers, Dekker, & Goudriaan, 2015). The study has been reviewed, approved, and monitored by the ethics committee of the Academic Medical Center of the University of Amsterdam, Amsterdam, The Netherlands, and was conducted in accordance with the Declaration of Helsinki.

### Participants

The target population consisted of patients 18 years of age or older with substance dependence or substance abuse (involving alcohol and/or drugs) according to the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria and at least one other mental disorder on DSM-IV Axis I or Axis II. Patients could not participate in the study if they did not have sufficient understanding of the Dutch language, were not willing to provide informed consent, or were not eligible for group therapy according to their case manager due to, for instance, severe psychotic symptoms or anti-social behavior.

### Procedures

Patients were recruited in an addiction-psychiatry clinic and allied addiction-psychiatry outpatient care facility in Amsterdam. Patients who met the inclusion criteria were informed and invited by a caregiver and researcher. During the inclusion period, a total of 616 patients with dual diagnosis were available for participation in the care facilities. Of this sample, 129 (21%) were not eligible for participation, mostly due to severe psychotic symptoms ($N$ = 49), severe cognitive problems ($N$ = 23), insufficient understanding of the Dutch language ($N$ = 21) or severe anti-social behavior ($N$ = 17). Of the 487 eligible patients, 216 (44%) declined to participate, 18 (4%) did not show up on appointments, and 10 (2%) withdrew from participation during the first assessment. The most frequently reported reasons to decline were being unmotivated for treatment ($N$ = 65) and not having time due to work or other therapy programs ($N$ = 49). In total, 243 patients were included in the study. Once the procedures had been fully explained and patients had given written informed consent, a face-to-face assessment was performed. The assessments were conducted at the treatment facility by a researcher (master's degree) and four trained master's degree students (with bachelor's degree) in clinical psychology.

**Comparison group**

The comparison group consisted of 10,865 participants from the general population of Amsterdam, recruited by Research Information and Statistics, commissioned by the governmental institution Statistics Netherlands. Questionnaires were distributed via the Internet and as paper copies. Participants who did not respond to the survey were telephoned or visited at home to finish the assessment. Both violent and property victimization are more prevalent in Amsterdam compared to the rest of the Netherlands (Akkermans & van Rosmalen, 2014). To be able to make a representative comparison, only participants from Amsterdam were included in the comparison group.

**Measures**

General demographic characteristics of participants were collected during the assessments. Current DSM-IV diagnoses of patients were extracted from the electronic patient record.

In both the patient group and the comparison group, victimization was measured with the Safety Monitor (in Dutch: Veiligheidsmonitor), developed by the Dutch Ministry of Security and Justice (Akkermans et al., 2014). The Safety Monitor is an adequate self-report instrument used by Statistics Netherlands to measure victimization on a large scale. It strongly resembles the International Crime Victimization Survey (ICVS; Killias, 2010). The Safety Monitor was used to examine whether participants experienced 9 different types of crime in the last 12 months, subdivided in three categories: violent crimes, property crimes, and vandalism. Violent crimes consisted of threats, sexual assault, and physical assault. Property crimes consisted of burglary, robbery or pickpocketing, car theft or property stolen from inside a car, bicycle theft, and other theft. Vandalism is defined as intentional damage to or destruction of personal property. For each crime, participants answered in a dichotomous yes/no format. Violent victimization and property victimization were scored positively when at least one type of crime of that particular crime category was reported by the participant. Total victimization was scored positively when a participant reported at least one type of crime in the last 12 months. For each crime reported, details of the incident were examined. This made it possible for the assessor the determine what exactly had happened and whether the incident indeed fell under that category of crime.

**Data analysis**

Statistical analysis were performed in SPSS Statistics 22.0. Weightings were used to ensure the groups were comparable. We used 3 auxiliary variables – age, gender and ethnicity – that were measured in both groups and may be associated to risk of victimization. Weights larger or smaller than 1 were assigned to participants who were

respectively underrepresented or overrepresented in the general population sample compared to the patient sample (for example, males: 70.4% / 46.7% = 1.51). Final weights were calculated by multiplying the 3 weights for age, gender, and ethnicity. For each type of victimization, a chi-square test was used to determine whether there was a significant difference between the weighted sample of the general population and patients with dual diagnosis in the prevalence of victimization. Statistical significance was set at $p < .05$. Risk ratios were calculated for each type of victimization.

# Results

The 243 included patients with dual diagnosis were on average 42 years old ($M = 42.3$, $SD = 10.8$) and were mostly males ($n = 171$, 70.4%). On average, patients were diagnosed with 3.7 psychiatric disorders according to DSM-IV ($M = 3.7$, $SD = 1.4$; see table 1). This is in accordance with the average number of psychiatric disorders according to DSM-IV in the total group of patients with dual diagnosis in the addiction-psychiatry clinic and outpatient care facility ($M = 3.7$, $SD = 1.1$).

As shown in table 2, patients with dual diagnosis were 1.9 times more likely to have been a victim of crime in the 12 months preceding the assessment (77%) compared to the general population (40%), $\chi^2$ (1, $N = 11108$) = 135.27, $p < .001$. Violent victimization was 5.6 times more prevalent in patients with dual diagnosis (60%) compared to the general population (11%), $\chi^2$ (1, $N = 11108$) = 561.23, $p < .001$. Patients were 5.8 times more likely to be victims of threats, 5.8 times more likely to be victims of sexual assault, and 14.8 times more likely to be victims of physical assault in the 12 months preceding the assessment. Furthermore, property victimization was 2.0 times more prevalent in patients with dual diagnosis (58%) compared to the general population (30%), $\chi^2$ (1, $N = 11108$) = 91.35, $p < .001$. Patients were 3.6 times more likely to be victims of robbery or pickpocketing, 2.2 times more likely to be victims of bicycle theft, and 4.6 times more likely to be victims of other theft in the 12 months preceding the assessment. Patients were 18.2 times less likely to have been a victim of car theft. The risk of burglary did not differ significantly between groups. Finally, vandalism was 1.6 times more prevalent in patients with dual diagnosis (21%) compared to the general population (14%), $\chi^2$ (1, $N = 11108$) = 12.02, $p = .001$).

**Table 1**

Demographic and clinical characteristics of patients with dual diagnosis

| | Total sample (*N* = 243) |
|---|---|
| Age, years, mean (SD) | 42.3 (10.8) |
| Male, *n* (%) | 171 (70.4) |
| No fixed abode, *n* (%) | 56 (23.0) |
| Substance use disorder, *n* (%) | |
| Alcohol | 154 (63.4) |
| Cannabis | 112 (46.1) |
| Cocaine | 107 (44.0) |
| Opioid | 56 (23.0) |
| Sedatives | 49 (20.2) |
| Other substances | 39 (16.0) |
| Psychiatric disorders, *n* (%) | |
| Psychotic disorder | 93 (38.3) |
| Personality disorder | 90 (37.0) |
| Mood disorder | 54 (22.2) |
| Anxiety disorder | 52 (21.4) |
| Intellectual disability | 31 (12.8) |
| Attention-deficit/hyperactivity disorder | 20 (8.2) |
| Other disorder | 28 (11.5) |
| Total number of psychiatric disorders, mean (SD) | 3.7 (1.4) |

*Note.* SD = standard deviation.

**Table 2**

Comparison of prevalence of victimization in patients with dual diagnosis and a weighted sample of the general population of Amsterdam

| | Patients with dual diagnosis (*N* = 243) | Population Amsterdam (*N* = 10865, weighted) | | | | |
|---|---|---|---|---|---|---|
| Type of victimization | % | % | $\chi^{2a}$ | *p* | *RR* | [95% CI] |
| Total victimization | 77 | 40 | 135.27 | <.001 | 1.92 | [1.79-2.07] |
| Violent victimization | 60 | 11 | 561.23 | <.001 | 5.64 | [5.02-6.33] |
| Threats | 47 | 8 | 447.83 | <.001 | 5.84 | [5.04-6.76] |
| Sexual assault | 12 | 2 | 101.42 | <.001 | 5.83 | [4.02-8.46] |
| Physical assault | 38 | 3 | 929.55 | <.001 | 14.75 | [12.12-17.96] |
| Property victimization | 58 | 30 | 91.35 | <.001 | 1.96 | [1.75-2.18] |
| (Attempted) burglary | 10 | 7 | 3.57 | .059 | 1.46 | [.99-2.14] |
| Robbery and pickpocketing | 17 | 5 | 72.25 | <.001 | 3.58 | [2.66-4.81] |
| Car theft and theft from car | 0 | 7 | 17.32 | <.001 | .055 | [.01-.39] |
| Bicycle theft | 32 | 15 | 56.98 | <.001 | 2.20 | [1.82-2.65] |
| Other theft | 30 | 7 | 201.31 | <.001 | 4.61 | [3.76-5.66] |
| Vandalism | 21 | 14 | 12.02 | .001 | 1.57 | [1.23-2.01] |

*Note.* CI = confidence interval; RR = risk ratio.
[a] *df* = 1

# Discussion

This study demonstrated that patients with dual diagnosis are more likely to be victims of crime compared to the general population. Disturbingly, 60% of the patients reported violent victimization and 58% reported property victimization in 12 months prior to the assessment. These rates are higher than those in patients with either a mental disorder or substance use disorder only. By comparison, a Dutch study using the same measurement instrument found past-year rates of 23% violent victimization and 22% property victimization in a sample of patients with severe mental illness (de Mooij et al., 2015). A European study in patients with substance use disorders reported past-year rates of 42% violent victimization and 48% property victimization (Stevens et al., 2007).

Previous studies showed that victimization is associated with psychopathology, substance use, homelessness, and engagement in criminal activity in patients with severe mental illness (de Mooij et al., 2015; Maniglio, 2009b). Substance use, more severe psychopathology, homelessness, and engagement in criminal activity may decrease patients' ability to accurately identify, evaluate, and avoid or cope with potentially dangerous situations (Maniglio, 2009b). For instance, patients who are intoxicated by alcohol or drugs are more likely to leave property unattended, are slower to react and less able to defend themselves, which makes them a suitable target for offenders (Bean, 2014; Traverso & Bagnoli, 2001). The high risk of victimization of patients with dual diagnosis might be due to the fact that a lot of risk factors for victimization are present in these patients. Psychopathology and substance use are inherent to suffering from dual diagnosis. Moreover, homelessness and criminal behavior are common problems in these patients (Drake et al., 1991; Scott, Lewis, & McDermott, 2006). Future research is necessary to expand knowledge on risk factors for victimization in patients with dual diagnosis. It should be examined whether risk factors observed in patients with severe mental illness also apply to patients with dual diagnosis.

The findings should be considered in the light of several limitations. We used baseline data of a randomized controlled trial and therefore the generalizability of the sample can be questioned. Patients that lacked the motivation or time declined participation. Nevertheless, the average number of psychiatric disorders of patients in this study sample is in accordance with the average number of psychiatric disorders of all patients with dual diagnosis in the addiction-psychiatry clinic and outpatient care facility. This supports the representativeness of the sample. In addition, victimization was measured with a self-report questionnaire, which is subject to memory bias. However, self-reports of victimization are considered to be more accurate than police reports, which tend to underestimate victimization rates (Truman & Planty, 2012).

This study is the first to compare past-year rates of victimization of patients with dual diagnosis with a sample of the general population. The results indicate that patients with dual diagnosis are highly prone to victimization. Awareness should be raised among clinicians and prevention programs are needed to reduce patients' vulnerability for victimization. A better understanding of the mechanisms underlying victimization can contribute to the development of prevention programs.

## Acknowledgements

We wish to thank Onderzoek en Statistiek Amsterdam, The Netherlands (Statistics Netherlands) for collecting the data in the general population of Amsterdam and providing us access.

# Chapter 3

## Gender differences in characteristics of physical and sexual victimization in patients with dual diagnosis: a cross-sectional study

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# Abstract

**Background:** Patients with substance use disorders and co-occurring mental health disorders are vulnerable to violent victimization. However, no evidence-based interventions are available to reduce patients' vulnerability. An exploration of the characteristics of physical and sexual violence can provide valuable information to support the development of interventions for these patients. This study aimed to examine gender differences in characteristics of violent victimization in patients with dual diagnosis.

**Methods:** In this cross-sectional survey study recent incidents of physical and sexual assault were examined with the Safety Monitor in 243 patients with dual diagnosis. Chi-square tests were used to examine gender differences in the prevalence of physical and sexual victimization. Fisher's exact tests and Fisher-Freeman-Halton exact tests were used to determine whether there were significant differences between victimized men and women with regard to perpetrators, locations, reporting to the police and speaking about the assault with others.

**Results:** There was no significant difference in the prevalence of physical violence in men (35%) and women (47%) with dual diagnosis. There was a significant association between gender of the victim and type of perpetrator ($p < .001$). Men were most often physically abused by a stranger or an acquaintance, whereas women were most frequently abused by an (ex)partner. Sexual violence was more prevalent in women (29%) compared to men (4%) ($p < .001$). Patients with dual diagnosis were unlikely to report incidents of physical abuse and sexual assault to the police and to speak about it with caregivers.

**Conclusions:** Characteristics of physical violence are different for men and women with dual diagnosis. Women with dual diagnosis are more often victims of sexual violence compared to men. Interventions aimed at reducing patients' vulnerability for victimization should take gender differences into account.

# Introduction

Almost half a million people die each year as a result of interpersonal violence (World Health Organization [WHO], 2014). Millions more suffer from non-fatal violence and it's far-reaching health consequences (WHO, 2014). Alongside physical injuries, interpersonal violence can lead to depression, unemployment, drug and alcohol misuse and posttraumatic stress disorder (Krug, Mercy, Dahlberg, & Zwi, 2002; WHO, 2014). Men are more often victims of fatal as well as non-fatal physical violence compared to women. In men, in most cases the perpetrator is a stranger (Tjaden & Thoenes, 2000). Domestic violence and sexual victimization are more prevalent in women. In women, in most cases the perpetrator of physical and sexual assault is an acquaintance or intimate partner (Krug et al., 2002; Tjaden & Thoenes, 2000). In the United States only 48% of physical assaults is reported to the police (Langton, Berzofsky, Krebs, & Smiley-McDonald, 2012). Victims of sexual violence are even less likely to report the abuse (Felson & Paré, 2005; Kaukinen, 2002; Langton et al., 2012).

Vulnerable groups, such as the elderly (Krug et al., 2002), people with disabilities (Fogden, Thomas, Daffern, & Ogloff, 2016; Hughes et al., 2012) and the homeless (Meinbresse et al., 2014) have a higher risk of becoming a victim of abuse. The last decades, numerous studies in different countries showed that violent victimization is also more prevalent in patients with severe mental illness (Khalifeh, Oram, Osborn, Howard, & Johnson, 2016; Maniglio, 2009b) and patients with substance use disorders (Stevens et al., 2007). In these patients, victimization has consistently been associated with more severe symptomatology, homelessness, more substance use, more psychiatric hospitalizations and engagement in criminal activities (Khalifeh et al., 2016; Maniglio, 2009b; Stevens et al., 2007). While numerous studies and several reviews cite prevalence rates and risk factors for violent victimization in patients with mental illness, only few studies with small sample sizes address *characteristics* of the incidents. Therefore, a clear picture of the characteristics of violence in patients with mental disorders is lacking. One study reports that patients with severe mental illness are mostly victimized by family members (Katsikidou et al., 2013), whereas two other studies report that most patients are victimized by strangers, followed by acquaintances, such as neighbors and to a much lesser extent by (ex)partners and family members (Bengtsson-Tops & Ehliasson, 2012; Meijwaard et al., 2015). Patients with severe mental illness seem to be most often violently victimized in their own home, whereas patients with substance disorders are most often violently victimized in public (Meijwaard et al., 2015; Mericle & Havassy, 2008). Unfortunately, none of these studies report results disaggregated by gender, probably due to small sample sizes.

It is thus unclear whether the gender differences that exist in the general population can be translated to patients with mental illness.

Patients with both psychiatric and substance use disorders (dual diagnosis) are even more vulnerable to victimization compared to patients with mental illness or substance use disorder only (de Waal, Dekker, & Goudriaan, 2017). Dual diagnosis are very common in the community and treatment settings (Kessler et al., 1996; SAMHSA, 2015), yet very little is known about victimization of this patient group. Caregivers need to be aware of incidents of violence to be able to provide support to patients. There is evidence that victimization is often undetected in health care facilities (Howard et al., 2010), but it is unclear whether patients are inclined to speak about incidents of victimization with caregivers, partners, family members or friends. Furthermore, it has been hypothesized that individuals with mental illness might be less likely to report victimization to the police, because of fear of not being believed or taken seriously (Silver, Arseneault, Langley, Caspi, & Moffitt, 2005). However, there is no evidence to support this hypothesis.

There is an urgent need for evidence-based interventions to reduce the risk of victimization of patients with mental illness and thereby improve their well-being (de Mooij et al., 2015; Morgan et al., 2016; Teplin et al., 2005). First attempts to develop interventions and investigate the effectiveness are underway (de Waal et al., 2015; van der Stouwe et al., 2016). An exploration of characteristics of physical and sexual violence in patients with dual diagnosis can provide valuable information to support the development of interventions for these patients. Furthermore, it provides caregivers with more insight in a phenomenon often overlooked (Howard et al., 2010). To the best of our knowledge, this is the first study to examine gender differences in characteristics of violent victimization in patients with dual diagnosis. Recent incidents of physical and sexual assault are explored with regard to the perpetrator, the location, reporting to the police and speaking about it with others. Consistent with studies in the general population, we hypothesize that men with dual diagnosis are most often victimized by strangers while women are most often victimized by partners or ex-partners. In both men and women we expect low rates of reporting victimization to the police.

# Methods

**Participants**

This cross-sectional study utilized baseline data from a randomized controlled trial designed to determine the effectiveness of a new intervention that aims to reduce

victimization in patients with dual diagnosis. Complete study details are described elsewhere (de Waal et al., 2015). The sample consisted of 243 participants. Participants were patients 18 years of age or older diagnosed with substance dependence or substance abuse (involving alcohol and/or drugs) according to the *Diagnostic and Statistical Manual of Mental Disorders-IV* (DSM-IV) criteria and at least one other mental disorder on DSM-IV Axis I or Axis II. Patients could not participate in the study if they did not have sufficient understanding of the Dutch language, were not willing to provide informed consent or were not eligible for group therapy according to their case manager, due to for instance severe psychotic symptoms or anti-social behavior.

**Procedures**

Patients were recruited in an addiction-psychiatry clinic and allied addiction-psychiatry outpatient care facility. Patients who met the inclusion criteria were informed and invited by a caregiver and researcher. Once the procedures had been fully explained and patients had given written informed consent, a face-to-face assessment was performed. The assessments were conducted at the treatment facility by a researcher (master's degree) and trained master students (with a bachelor's degree) in clinical psychology. The inclusion period lasted two years, from April 2014 to April 2016.

**Measures**

***Demographics***

Demographic characteristics were collected during the assessment. Current DSM-IV diagnoses were determined by psychiatrists and extracted from the electronic patient record.

***Victimization***

Victimization was measured with the Safety Monitor (in Dutch: Veiligheidsmonitor), developed by the Dutch Ministry of Security and Justice (Akkermans et al., 2014). The Safety Monitor is an adequate self-report instrument used by the governmental institution Statistics Netherlands to measure victimization on a large scale. It strongly resembles the International Crime Victimization Survey (ICVS; Killias, 2010). The Safety Monitor was used to examine whether participants experienced different types of crime in the last 12 months. Each crime reported is followed by an exploration of the most recent incident. Data regarding physical abuse and sexual assault were used in this study. The Safety Monitor contains questions regarding the perpetrator and the location of the abuse. Perpetrators can be strangers, (ex)partners, relatives, neighbors, fellow patients or acquaintances. The category 'acquaintance' includes: friends of friends, friends or relatives of ex-partners and drug dealers. Furthermore, it is examined whether the incident was reported to the police and whether participants

spoke about the incident with others. If relevant, reasons for not reporting to the police were examined. To be able to exemplify our findings we extended the Safety Monitor with an open question which invited participants to shortly describe what led to the incident.

**Data analysis**

Statistical analyses were performed in SPSS Statistics 22.0. Chi-square tests and independent t-tests were used to examine gender differences in clinical and demographic characteristics and prevalence of physical and sexual victimization. Patients that were a victim of physical and/or sexual violence were included in the subsequent analyses. Fisher's exact tests and Fisher-Freeman-Halton exact tests were used to determine whether there were significant differences between victimized men and women with dual diagnosis with regard to perpetrators, locations, reporting to the police and speaking with others. The Fisher-Freeman-Halton exact test is an extension of the Fisher's exact test that can be applied to unordered r x c tables. A Fisher-Freeman-Halton exact test was used to determine whether there is an association between type of perpetrator and location of violence in the four most frequently reported perpetrators. Statistical significance was set at $p < .05$.

# Results

In total, 243 participants were included in the study. During the inclusion period, there were 487 eligible patients, of which 216 (44%) declined to participate, 18 (4%) did not show up on appointments and 10 (2%) withdrew from participations during the first assessment. The most frequently reported reasons to decline were being unmotivated for treatment ($n$ = 65) and not having time due to work or other therapy programs ($n$ = 49). On average, the 243 included participants were 42.3 years old ($SD$ = 10.9) and were diagnosed with 3.7 mental health disorders according to DSM-IV ($SD$ = 1.4). The majority was male (70.4%).

**Demographic and clinical characteristics by gender**

Table 1 lists demographic and clinical characteristics of the 243 participants disaggregated by gender. Personality disorders were more prevalent in women compared to men (61% vs. 27%, $\chi^2 = 25.428$, $df = 1$, $p < .001$). There were no other significant gender differences in demographic and clinical characteristics.

**Table 1**

Demographic and clinical characteristics and violent victimization of men and women with dual diagnosis

| | Patients with dual diagnosis (*N* = 243) | | | |
|---|---|---|---|---|
| | Men (*n* = 171) | Women (*n* = 72) | $t/\chi^2$ | *p* |
| Age, mean (SD) | 41.8 (11.0) | 43.4 (10.4) | 1.100 | .273 |
| Unemployed, % | 91.8 | 95.8 | 1.259 | .262 |
| Substance use disorders, %[a] | | | | |
| Alcohol | 63.2 | 63.9 | 0.012 | .914 |
| Cannabis | 49.7 | 37.5 | 3.039 | .081 |
| Cocaine | 44.4 | 43.1 | 0.040 | .842 |
| Opioid | 21.1 | 27.8 | 1.292 | .256 |
| Sedatives | 17.0 | 27.8 | 3.684 | .055 |
| Other substances | 12.9 | 15.3 | 0.251 | .616 |
| Psychiatric disorders Axis I, %[a] | | | | |
| Psychotic disorder | 42.1 | 29.2 | 3.590 | .058 |
| Mood disorders | 22.2 | 22.2 | 0.000 | 1.000 |
| Anxiety disorders | 21.6 | 20.8 | 0.019 | .889 |
| Attention-deficit/hyperactivity disorder | 8.8 | 6.9 | 0.224 | .636 |
| Other disorder | 13.5 | 6.9 | 2.104 | .147 |
| Psychiatric disorder Axis II, %[a] | | | | |
| Personality disorder | 26.9 | 61.1 | 25.428 | **<.001** |
| Intellectual disability | 12.9 | 12.5 | 0.006 | .938 |
| Total number of disorders, mean (SD) | 3.7 (1.4) | 3.8 (1.3) | -0.831 | .407 |
| Violent victimization, % | | | | |
| Physical violence | 34.5 | 47.2 | 3.470 | .063 |
| Sexual violence | 4.1 | 29.2 | 31.243 | **<.001** |

*Note.* Significant findings are shown in bold. SD = standard deviation.
[a] Disorders can co-occur.

**Violent victimization**

Of the 171 male participants 59 (35%) reported physical violence in the last 12 months and 7 (4%) reported sexual violence. Of the 72 female participants 34 (47%) reported physical violence in the last 12 months and 21 (29%) reported sexual violence. There was no significant gender difference in the prevalence of physical violence. Sexual violence was significantly more prevalent in women compared to men ($\chi^2 = 31.243$, $df = 1$, $p < .001$, Table 1). Participants that were a victim of physical and/or sexual violence ($n = 102$) were included in the subsequent analyses.

**Physical violence**

In victims of physical violence ($n = 93$) there was a significant association between gender of the victim and type of perpetrator ($p < .001$), as shown in Table 2. Male patients with dual diagnosis were most often physically victimized by a stranger (35.6%) or an acquaintance (32.2%), followed by a relative (11.9%), (ex)partner (8.5%), fellow patient (8.5%) and neighbor (3.4%). Female patients were most often victimized by an (ex)partner (41.2%), followed by a stranger (26.5%), fellow patient (11.8%), acquaintance (11.8%) and neighbor (9.1%). Furthermore, there was a significant association between gender of the victim and location where the physical violence took place ($p = .007$). Male patients with dual diagnosis were most often physically victimized in public (55.9%), followed by at home (37.3%) and in another person's home (6.8%). Female patients were most often victimized at home (44.1%) followed by in public (32.4%), in a care facility (14.7%) and in another person's home (8.8%).

Men with dual diagnosis were significantly less likely to report physical victimization to the police compared to women (8.5% vs. 29.4%, $p = .017$, Table 2). In the group of participants that did not report the physical abuse to the police, the most cited reasons for not reporting were: belief that the police could or would not do anything to help (26.9%), fear of reprisal or getting the offender in trouble (25.6%), dealt with it in another way (16.7%) and fear to get in trouble with the law themselves (15.4%). There was no significant gender difference in speaking with others about the incident. Most of the victims of physical abuse spoke about the abuse with at least one other person (86.0%). The most cited persons with whom victims spoke about the abuse were: a friend (41.9%), relative (30.1%), caregiver (29.0%) and partner (15.1%).

**Table 2**

Characteristics of most recent incident of physical victimization in men and women with dual diagnosis

| | Total ($n$ = 93) | Men ($n$ = 59) | Women ($n$ = 34) | $p$ |
|---|---|---|---|---|
| Perpetrator, % | | | | |
| Stranger | 32.3 | 35.6 | 26.5 | **<.001**[a] |
| (Ex)partner | 20.4 | 8.5 | 41.2 | |
| Relative | 7.5 | 11.9 | 0.0 | |
| Neighbor | 5.4 | 3.4 | 9.1 | |
| Fellow patient | 9.7 | 8.5 | 11.8 | |
| Acquaintance | 24.7 | 32.2 | 11.8 | |
| Location, % | | | | |
| At home | 39.8 | 37.3 | 44.1 | **.007**[a] |
| Other's home | 7.5 | 6.8 | 8.8 | |
| In public | 47.3 | 55.9 | 32.4 | |
| Clinic/daycare | 5.4 | 0.0 | 14.7 | |
| Reported to police, % | | | | |
| Yes | 16.1 | 8.5 | 29.4 | **.017**[b] |
| No | 83.9 | 91.5 | 70.6 | |
| Speaking with others, % | | | | |
| Yes | 86.0 | 84.7 | 88.2 | .762[b] |
| No | 14.0 | 15.3 | 11.8 | |

*Note.* Significant findings are shown in bold.
[a] Fisher-Freeman Halton test
[b] Fisher's exact test

**Sexual violence**

One of the 7 male patients that reported sexual violence refused to answer questions about characteristics of the incident. The remaining number of males who reported sexual assault ($n$ = 6) was too low to make a reliable comparison with the female sexual assault victims ($n$ = 21). Therefore we will describe the characteristics of the total group of patients with dual diagnosis that were a victim of sexual assault. As shown in Table 3, most victims reported sexual assault by a stranger (40.7%) followed by an (ex)partner (18.5%) and fellow patient (18.5%). Patients were most often sexually victimized at home (37.0%) followed by in another person's home (29.6%), in public (18.5) and in a care facility (14.8%).

Only 18.5% of the victims reported the sexual assault to the police. The most cited reasons for not reporting the incident were: the belief that the police could or would not do anything to help (27.3%) and fear of reprisal or getting the offender in trouble (18.2%). Most of the victims of physical abuse spoke about the abuse with at least one other person (74.4%). The most cited persons with whom victims spoke about the abuse were: a friend (37.0%), caregiver (37.0%), relative (14.8%) and partner (11.1%).

**Further exploration per type of perpetrator**

We further explored the four most frequently reported perpetrators of all incidents of physical and sexual violence. As shown in Table 4, there was a significant association between the type of perpetrator and the location where the victimization took place ($p < .001$). When patients with dual diagnosis were victimized by a stranger, this mostly took place in public (71%). When patients with dual diagnosis were victimized by an (ex)partner, this mostly took place at home (71%). When patients were victimized by a fellow patient, this mostly took place at home (36%) or in a care facility (36%). Table 5 provides several incident descriptions of participants to exemplify the types of violence suffered by different perpetrators.

**Table 3**

Characteristics of most recent incident of sexual victimization in men and women with dual diagnosis

| | Total (*n* = 27) | Men (*n* = 6) | Women (*n* = 21) |
|---|---|---|---|
| Perpetrator, % | | | |
| Stranger | 40.7 | 83.3 | 28.6 |
| (Ex)partner | 18.5 | 0.0 | 23.8 |
| Relative | 0.0 | 0.0 | 0.0 |
| Neighbor | 7.4 | 0.0 | 9.5 |
| Fellow patient | 18.5 | 16.7 | 19.0 |
| Acquaintance | 14.8 | 0.0 | 19.0 |
| Location, % | | | |
| At home | 37.0 | 0.0 | 47.6 |
| Other's home | 29.6 | 50.0 | 23.8 |
| In public | 18.5 | 50.0 | 9.5 |
| Clinic/daycare | 14.8 | 0.0 | 19.0 |
| Reported to police, % | | | |
| Yes | 18.5 | 16.7 | 19.0 |
| No | 85.2 | 83.3 | 81.0 |
| Speaking with others, % | | | |
| Yes | 74.4 | 67.7 | 76.2 |
| No | 25.6 | 33.3 | 23.8 |

**Table 4**

Associations between type of perpetrator and location of violent victimization of patients with dual diagnosis

| | Stranger (*n* = 41) | (Ex)partner (*n* = 24) | Fellow patient (*n* = 12) | Acquaintance (*n* = 27) | *p* |
|---|---|---|---|---|---|
| Location, % | | | | | |
| At home | 12.2 | 70.8 | 35.7 | 25.9 | **<.001[a]** |
| Other's home | 12.2 | 8.3 | 14.3 | 22.2 | |
| In public | 70.7 | 12.5 | 14.3 | 51.9 | |
| Clinic/daycare | 4.9 | 8.3 | 35.7 | 0.0 | |

*Note.* Significant findings are shown in bold.
[a] Fisher-Freeman Halton test

**Table 5**

Examples of incident descriptions of victimization of dual diagnosis patients ordered by type of perpetrator

| |
|---|
| Stranger |
| A stranger that I met on the streets promised me drugs, so I went with him to his place. When we were there he suddenly started to undress me. |
| Two guys pulled me from my bike, knocked me down and threatened me with a knife. They took the money from my wallet. |
| (Ex)partner |
| I used all our money to buy cocaine. When my partner found out she got angry and hit me. |
| I got home late, which made my husband think I cheated on him and therefore he beat me up. |
| Fellow patient |
| He is very short tempered and outside he suddenly kicked me in the shins because of an argument we had earlier at daycare. |
| We were both admitted in the clinic. He made sexually offensive remarks and touched my intimate body parts. |

# Discussion

In the present study, patients with dual diagnosis were most often physically victimized by a stranger (32.3%), followed by an acquaintance (24.7%) and (ex)partner (20.4%). This is in accordance with findings in patients with severe mental illness from the Netherlands (Meijwaard et al., 2015) and from Sweden (Bengtsson-Tops & Ehliasson, 2012), but in contrast to a study conducted in Greece (Katsikidou et al., 2013) in which patients with severe mental illness were mostly victimized by family members (45.8%). This difference is probably due to the fact that the Greek study was conducted in an isolated, rural area where family members are more dependent on each other, whereas the present study is conducted in the capital city of the Netherlands. In our study, physical abuse of patients with dual diagnosis mostly took place in public (47.3%), or in a patient's own home (39.8%). Previous studies imply that patients with substance use disorders are mostly victimized in public, whereas patients with severe mental illness are more often victimized at home (Meijwaard et al., 2015; Mericle & Havassy, 2008). Patients with co-occurring mental health and substance use disorders seem to be vulnerable to physical abuse in both locations. Perpetrators of sexual assault were mostly strangers (40.7%) followed by (ex)partners (18.5%). Sexual violence mostly took place at home (37.0%) followed by in another's home (29.6%) and in public (18.5%). This is largely in line with findings in patients with severe mental illness from Sweden (Bengtsson-Tops & Ehliasson, 2012).

In contrast to previous studies (Bengtsson-Tops & Ehliasson, 2012; Katsikidou et al., 2013; Meijwaard et al., 2015), we examined gender differences with regard to the perpetrators and locations of physical violence. We found that men were mostly physically abused in public, whereas women were most often physically abused at home. In men, in most cases, the perpetrator was a stranger, whereas in women in most cases the perpetrator was an (ex)partner. This is in accordance with our hypothesis and with findings in the general population (Krug et al., 2002; Tjaden & Thoennes, 2000). We found that sexual assault was more prevalent in women with dual diagnosis compared to men. Too few men reported sexual assault in the 12 months prior to taking the assessment to draw reliable conclusions on the effect of gender on characteristics of sexual victimization. Women were mostly sexually assaulted by a stranger. This is in contrast to the general population, in which 62% of women who are raped during adulthood are raped by an intimate partner (Tjaden & Thoennes, 2000).

Consistent with our hypothesis we found that patients with dual diagnosis were unlikely to report physical victimization to the police (16.1%). Men were even more unlikely to report physical abuse to the police compared to women. We found lower rates of

reporting in patients with dual diagnosis compared to the general population of the Netherlands in which it is estimated that 44% of incidents of violent victimization are reported to the police (Centraal Bureau voor de Statistiek [CBS], 2016). Interestingly, the gender difference that we found in patients with dual diagnosis does not exist in the general population (CBS, 2016; Felson & Paré, 2005; Kaukinen, 2002). Women with dual diagnosis reported physical victimization in 29.4% of the cases and sexual victimization in 19.0% of the cases. Whilst these women are less inclined to speak to the police compared to women from the general population, the pattern is similar: sexual violence is less likely to be reported than physical violence (Felson & Paré, 2005; Kaukinen, 2002; Langton et al., 2012). For both physical and sexual assault, the most cited reasons for not reporting the incident to the police were the belief that the police could or would not do anything to help and fear of reprisal or getting the offender in trouble. Furthermore, with regard to physical abuse, victims reported that they dealt with the incident in another way or did not report the incident because of fear to get in trouble with the law themselves. Similar beliefs and fears also exist in the general population, except for two differences (Felson & Paré, 2005; Langton et al., 2012). First, the percentage of people who believe the police could or would not do anything to help is larger in patients with dual diagnosis compared to the general population. Second, patients report more fear to get in trouble with the law themselves. This might (partly) explain why rates of reporting are lower in patients with dual diagnosis. The 'stratification hypothesis' (Black, 1976) states that social-economic disadvantaged people are more inclined to try to deal with problems themselves without involving the justice system. The relationship between socioeconomic status and victim reporting may be mediated by the factor trust in (the effectiveness of) the police (Baumer, 2002). A subculture of people who are somewhat alienated from society may develop alternative ways of dealing with crime, in which people are seen as responsible for their own safety and in which involving the police is seen as weak and cowardly (Anderson, 1999; Baumer, 2002). This theory could be applicable to patients with dual diagnosis, who have to engage themselves in the illegal circuit to obtain drugs and who, on average, are more inclined to engage in criminal behavior themselves (Somers, Moniruzzaman, Rezansoff, Brink, & Russolillo, 2016). The concern that their own illegal activities might come up may detain patients from making contact with the police (Anderson, 1999). Finally, the lower tendency of patients with dual diagnosis to report victimization to the police may be explained by the finding that in general, victims who were using drugs or drinking alcohol when they were victimized are less likely to notify the police (Felson & Paré, 2005). Future studies should address these hypotheses.

Most victims of physical abuse and sexual assault spoke about the incident with at least one other person (respectively 86.0% and 74.4%). Victims mostly spoke with

friends and to a lesser extend with caregivers and relatives. In the general population, many victims who do not report to the police use alternative help-seeking strategies, such as seeking support from friends, family or social services (Kaukinen, 2002). This can provide social support and comfort to crime victims. The availability and benefits of support from friends, family and caregivers need to be further explored in patients with dual diagnosis. Future studies should examine whether seeking help from others and reporting to the police influence well-being and risk of future victimization and how patients' willingness to seek help can be raised.

The most important strength of this study is the amount of detailed information collected in a sample of patients with dual diagnosis. However, the study is not without limitations. First, the experiences of physical and sexual violence were examined with a self-report questionnaire, which is subject to memory bias. Second, we only have information about the most recent incidents of physical and sexual violence and therefore cannot draw conclusions on perpetrators, locations and police reporting in patients who are victims of multiple incidents of violence. Finally, it was impossible to draw conclusions on gender differences with regard to sexual violence, since a small number of men experienced sexual violence. This limitation also applies to studies in the general population (Black, et al., 2011).

**Conclusions and implications**

There are similarities as well as differences between men and women with dual diagnosis in characteristics of physical and sexual victimization. Both men and women are frequently violently victimized in public by strangers, which suggests it may be useful for patients with dual diagnosis to gain more 'street skills' by learning about changeable factors that contribute to their safety in public (Corrigan & Holmes, 1994; Holmes, Corrigan, Stephenson, & Nugent-Hirschbeck, 1997). Furthermore, both men and women are frequently violently victimized by someone they know, which suggests it may be helpful for patients with dual diagnosis to gain more social skills and conflict resolution skills (de Waal et al., 2015). Women with dual diagnosis are more often a victim of sexual violence and partner violence compared to men. Recently, two new interventions have been developed that aim to reduce patients' vulnerability for victimization (de Waal et al., 2015; van der Stouwe et al., 2016), however, these interventions do not take gender differences into account. Our findings suggest that it is necessary to address at least some of the needs of women with dual diagnosis separately. Since, to the best of our knowledge, we are the first to examine gender differences in characteristics of physical and sexual violence in patients with dual diagnosis, replication of our findings is necessary, also in other countries.

Besides, further research is needed to determine differences in characteristics of victimization in different patient groups (e.g. patients with psychotic disorders, patients with personality disorders and patients with substance use disorders) and different living situations (e.g. rural vs. urban). This type of research can provide a clearer understanding of violent victimization in patient populations and result in suggestions for the further development of personalized interventions to reduce victimization in the diverse population of patients with psychiatric disorders.

# Chapter 4

## Factors associated with victimization in dual diagnosis patients

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# Abstract

**Background:** Patients with a substance use disorder and co-occurring mental disorder are prone to victimization. There is a lack of research identifying variables related to violent and property victimization in this high risk group. The aim of this study was to identify factors associated with violent and property victimization in male and female dual diagnosis patients in order to identify targets for prevention.

**Methods:** In a cross-sectional study, victimization and demographic, clinical and psychological characteristics were assessed in 243 treatment-seeking patients with dual diagnosis. Patients were recruited in an addiction-psychiatry clinic and an allied outpatient care facility in Amsterdam, the Netherlands.

**Results:** In a multiple logistic regression analysis, violent victimization was independently associated with younger age, female gender, violent offending and a self-sacrificing and overly accommodating interpersonal style ($p < .001$; $\chi^2 = 108.83$, $df = 8$, $R^2 = .49$) in dual diagnosis patients. In male patients, violent victimization was independently associated with younger age, violent offending and a self-sacrificing and overly accommodating interpersonal style ($p < .001$; $\chi^2 = 91.90$, $df = 7$, $R^2 = .56$). In female patients, violent victimization was independently positively associated with homelessness, violent offending, a domineering/controlling interpersonal style, and negatively associated with being socially inhibited and cold/distant ($p < .001$; $\chi^2 = 34.08$, $df = 4$, $R^2 = .53$). Property victimization was independently associated with theft offending ($p < .001$, $\chi^2 = 26.99$, $df = 5$, $R^2 = .14$).

**Conclusions:** Given the high prevalence of victimization in dual diagnosis patients and its related problems, preventive interventions should be developed. Interventions should target interpersonal skills to decrease vulnerability to victimization, address the overlap between victimization and offending and incorporate gender-specific elements.

# Introduction

Patients with substance use disorders are more likely to be victims of crime compared to the general population (Stevens et al., 2007; Vaughn et al., 2010). The stressful experience of victimization leads to worse treatment outcomes in these patients (Pirard, Sharon, Kang, Angarita, & Gastfriend, 2005). Almost half of the people who suffer from an alcohol or drug use disorder also suffer from another mental disorder (Kessler, 2004). These dual diagnosis patients have been found to be especially vulnerable to violent and property crime (de Waal, Dekker, & Goudriaan, 2017). The current study examined factors associated with violent and property victimization in male and female dual diagnosis patients.

In substance use disorder patients, violent victimization (e.g. physical abuse) has been associated with younger age, female gender, homelessness, offending, psychiatric distress, frequent drug use and involvement in the drug subculture (Neale et al., 2005; Stevens et al., 2007; Walton, Chermack, & Blow, 2002). Substance users may be more prone to both victimization and offending compared to the general population due to their lifestyle, routines and activities. Routine activity theory (Cohen & Felson, 1979) states that people who are suitable targets, spend time in groups that include many offenders, and have no 'capable guardians' are more likely to become victims of crime. Capable guardians can be police patrols, health professionals, and friends, family members or neighbors who discourage potential offenders from perpetrating a crime. Amongst substance users, the roles of victims and offenders seem to be closely intertwined. Those who are violent themselves are at increased risk of experiencing violence (Neale et al., 2005).

In patients with severe mental illness, violent victimization has been associated with similar factors, namely, homelessness, offending, more severe symptomatology and substance use (Goodman et al., 2001; Maniglio, 2009b). In addition, female gender is associated with violent victimization in homeless individuals with severe mental illness (Roy, Crocker, Nicholls, Latimer, & Ayllon, 2014). However, there is a lack of research identifying variables related to victimization in the high risk group of dual diagnosis patients. Presumably, the risk factors for violent victimization of patients with a substance use disorder or a mental disorder also apply to patients who suffer from dual diagnosis, but this is still unknown.

Unfortunately, most studies in patient groups have linked violent victimization to characteristics that are hardly changeable (e.g. age, gender, living situation) or inherent to the patients' illness (e.g. psychiatric distress, substance use) (Neale et al.,

2005; Stevens et al., 2007; Walton et al., 2002). Consequently, there are no evidence-based treatments available directly aimed at increasing resilience and reducing victimization in people with substance use disorders and/or other mental disorders. Several researchers have advocated skills training (de Mooij et al., 2015; Kamperman et al., 2014; Teplin et al., 2005) to improve conflict management skills or personal safety skills and thereby reduce the risk of victimization, and results of the first attempts to develop and study interventions are underway (de Waal et al., 2015; van der Stouwe et al., 2016). However, it is unclear which vulnerabilities should specifically be addressed by skills training. Some studies have indicated that violent victimization may be related to potentially changeable, psychological vulnerabilities, such as interpersonal problems (Stepp et al., 2012) and emotion regulation difficulties (Messman-Moore et al., 2013), especially in women. Women with a history of childhood abuse are more likely to be revictimized as adults (Neumann, Houskamp, Pollock, & Briere, 1996). Childhood abuse may alter an individual's personality and social development in such a way that it leads to an increased risk of adult revictimization (Grauerholz, 2000). Children learn rules and social constructs of relationships through experiences with their primary caregivers. According to attachment theory (Bowlby, 1973), growing up in an unsafe and violent environment may prohibit the acquisition of social skills and lead to serious problems in relationship patterns. Classen, Field, Koopman, Nevill-Manning, and Spiegel (2001) found that in women with childhood abuse-related PTSD, those who were recently revictimized reported more interpersonal problems. The authors theorized that childhood abuse can lead to interpersonal difficulties, which in turn may lead to a greater likelihood of being revictimized in the future. Similarly, in patients with an anxiety disorder and/or depression, childhood physical abuse is related to significantly higher levels of domineering/controlling and intrusive/needy interpersonal styles during adulthood (Huh, Kim, Yu, & Chae, 2014). Unfortunately, this study did not measure adult revictimization. In psychiatric outpatients, interpersonal problems were demonstrated to mediate the relationship between borderline personality disorder (BPS) symptoms and violent victimization (Stepp et al., 2012). Higher levels of aggression and hostility predicted violent victimization, whereas higher levels of interpersonal sensitivity protected patients from being violently victimized. The authors theorized that patients who are highly sensitive to criticism may avoid relationships with individuals who are prone to engage in violent behavior. Yet another study reported that the relationship between BPS symptoms and experiences of violent victimization is fully mediated by emotion regulation difficulties (Scott, Stepp, & Pilkonis, 2014). The authors suggest that patients who find it difficult to regulate intense emotional experiences may be more prone to risky behaviors and involvement in abusive relationships, which increases their vulnerability to violent victimization. Emotion regulation difficulties have also been associated with sexual revictimization in female college students in a cross-sectional (Messman-Moore, Walsh, & DiLillo, 2010) as well

as a prospective study (Messman-Moore et al., 2013). Unfortunately, to the best of our knowledge, there are no studies in patients with substance use disorders (or dual diagnosis) that have examined the link between potentially changeable characteristics, such as interpersonal problems and emotion regulation difficulties, and violent victimization.

The studies described above, which link interpersonal problems and emotion dysregulation to violent victimization, were mostly conducted in female samples. Most studies examining risk factors for violent victimization in patients with substance use disorders or severe mental illness do not report results for males and females separately. One study that did examine gender differences observed similar demographic and psychiatric correlates of recent violent victimization for women and men with severe mental illness (Goodman et al., 2001). However, a recent study in our cohort showed that the nature and context of violent victimization differs for male and female dual diagnosis patients, with men most often being physically abused by a stranger or acquaintance in public areas and women being most frequently abused by an (ex)partner at home (de Waal, Dekker, Kikkert, Kleinhesselink, & Goudriaan, 2017). Therefore it is relevant to examine variables associated with victimization for male and female patients separately.

Alongside violent crime, patients with severe mental illness and/or substance use disorders are at higher risk to be victims of property crime (e.g. theft) compared to the general population (de Mooij et al., 2015; de Waal, Dekker, & Goudriaan, 2017; Stevens et al., 2007). However, in patient groups, relatively little attention has been paid to correlates of property crime victimization. One study in patients with drug dependence reported that property victimization was associated with being female and having a history of anxiety (Stevens et al., 2007). From a routine activity theory perspective, one could argue that patients with substance use disorders are at higher risk of property victimization since they are suitable targets that spend time in groups with many offenders, in the absence of capable guardians (Cohen & Felson, 1979). When intoxicated by alcohol or drugs, one is more likely to leave property unattended, is slower to react, less able to defend him/herself and therefore an easier target (Traverso & Bagnoli, 2001). Furthermore, to obtain an illegal drug, the user must enter the world of drug trade, where a variety of transaction-related crimes occur, such as theft from drug dealers, theft from users who did not pay their debts and resolution of disputes over low-quality drugs (Traverso & Bagnoli, 2001). In the Dutch general population, offenders of property crimes are more likely than non-offenders to also be victims of property crimes (Wittebrood & Nieuwbeerta, 1999). To the best of our knowledge, there are no studies in dual diagnosis patients that have examined factors associated with property victimization.

This study is the first to examine factors that may be associated with victimization in dual diagnosis patients. This is important, since it will help to identify which patients are particularly prone to victimization and will provide a basis for the development of preventive interventions. We aimed to determine which of the factors described in the literature are related to violent and property victimization in dual diagnosis patients in Amsterdam, the Netherlands, overall, and in men and women separately. Routine activity theory was used as a guiding framework, the tenets of the theory were not directly tested. We hypothesized that female gender is a risk factor for both violent and property victimization. Furthermore, we hypothesized that violent victimization is associated with younger age, homelessness, violent offending, more severe psychopathology, more severe substance use problems, interpersonal problems and emotion regulation difficulties in both male and female dual diagnosis patients. Finally, we hypothesized that property victimization is associated with theft offending and more severe substance use problems in both male and female dual diagnosis patients.

# Material and methods

**Design and procedures**

This cross-sectional study was based on baseline data from the Self-wise, Other-wise, Streetwise (SOS) study (de Waal et al., 2015). The SOS study is a randomized controlled trial to investigate the effectiveness of a new intervention that aims to reduce victimization in dual diagnosis patients. The data used in the current study was collected prior to randomization. Patients were recruited from an inpatient addiction-psychiatry clinic and an allied addiction-psychiatry outpatient care facility in Amsterdam, where patients are treated for substance use disorders and other mental disorders simultaneously. Although some patients were mandated to treatment, participating in this study was voluntarily. During the inclusion period of two years (April 2014 – April 2016), eligible patients were informed and invited by a caregiver and researcher. There were 487 eligible patients, of whom 216 (44%) declined to participate, 18 (4%) did not show up on appointments and 10 (2%) withdrew from participations during the first assessment. The most frequently reported reasons to decline were lack of motivation for therapy ($n$ = 65) and not having time due to work or other therapy programs ($n$ = 49). All participants completed a 1.5 hour face-to-face assessment which was conducted at the treatment facility. Participants received a monetary compensation of 15 Euros for the assessment. The assessments were conducted by a researcher and trained master students with master's and bachelor's degrees in clinical psychology, respectively.

**Table 1**

Sociodemographics and DSM-IV diagnoses of dual diagnosis patients (*N* = 243)

| | Dual diagnosis patients (*N* = 243) |
|---|---|
| Age, years, mean (SD) | 42.3 (10.9) |
| Sex, *n* (%) | |
| Male | 171 (70.4) |
| Female | 72 (29.6) |
| Country of birth, *n* (%) | |
| The Netherlands | 178 (73.3) |
| Europe, other than NL | 15 (6.2) |
| Suriname | 15 (6.2) |
| Morocco | 11 (4.5) |
| Netherlands Antilles | 6 (2.5) |
| Other | 18 (7.4) |
| Homelessness, *n* (%) | |
| Not homeless | 187 (77.0) |
| Homeless | 56 (23.0) |
| Employment status, *n* (%) | |
| Employed | 17 (7.0) |
| Unemployed | 226 (93.0) |
| Psychiatric Disorder Axis I: substance use disorder, *n* (%) | |
| Alcohol | 154 (63.4) |
| Cannabis | 112 (46.1) |
| Cocaine | 107 (44.0) |
| Opioid | 56 (23.0) |
| Sedatives | 49 (20.2) |
| Amphetamines | 28 (11.5) |
| Other substances | 11 (4.5) |
| Psychiatric disorders Axis I: other than SUD, *n* (%) | |
| Psychotic disorder | 93 (38.3) |

*table continues*

| | | |
|---|---|---|
| Mood disorder | 54 | (22.2) |
| Anxiety disorder | 52 | (21.4) |
| Attention-deficit/hyperactivity disorder | 20 | (8.2) |
| Other disorder | 28 | (11.5) |
| Psychiatric disorders Axis II, *n* (%) | | |
| Personality disorder | 90 | (37.0) |
| Intellectual disability | 31 | (12.8) |
| Total number of Psychiatric Disorders, mean (SD) | 3.7 | (1.4) |
| Number of days in inpatient care in the last 90 days, mean (SD) | 23.7 | (26.7) |

*Note.* DSM-IV = Diagnostic and Statistical Manual of Mental disorders, 4th edition; NL = the Netherlands; SD = standard deviation; SUD = substance use disorder.

**Participants**

The sample consisted of 243 patients 18 years of age or older with substance dependence or substance abuse (involving alcohol and/or drugs) according to Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria and at least one other DSM-IV Axis I or Axis II mental disorder. Patients could not participate in the study if they had insufficient understanding of the Dutch language, were unwilling to provide informed consent or were not eligible for group therapy according to their case manager, due to for instance severe psychotic symptoms or anti-social behavior.

Table 1 lists the demographic characteristics and DSM-IV diagnoses of the 243 participants. The majority was male (70.4%). On average, participants were 42.3 (*SD* = 10.9) years old and were diagnosed with 3.7 (*SD* = 1.4) DSM-IV mental health disorders. Differences between men and women in demographic characteristics and DSM-IV diagnoses were examined in a prior study that utilized the same dataset (de Waal, Dekker, Kikkert, et al., 2017). There were no significant gender differences other than personality disorders being more prevalent in women compared to men.

**Measures**

***Demographics***

The demographic characteristics age, gender, country of birth, homelessness, number of inpatient days and employment status were collected during the assessment. Homelessness was defined as having no fixed abode at the time of the assessment. Employment status was defined as having any paid employment (fulltime or part-time) at the time of the assessment. Number of inpatient days was defined as the number of days admitted to the inpatient addiction-psychiatry clinic in the 90 days prior to

the assessment. Current DSM-IV diagnoses were determined by psychiatrists and extracted from the electronic patient record.

***Victimization***

Victimization was assessed with the Safety Monitor (in Dutch: Veiligheidsmonitor, VM section 4; Akkermans et al., 2014), developed by the Dutch Ministry of Security and Justice. The Safety Monitor is a nationwide victimization survey that strongly resembles the International Crime Victims Survey (ICVS; Killias, 2010). The Safety Monitor was used in a face-to-face interview to examine whether participants experienced different types of victimization in the last 12 months. For inpatients this period usually included several weeks of inpatient treatment. Violent victimization consisted of: physical abuse, sexual assault and threats. Property victimization consisted of: burglary, car theft, theft from car, other motor vehicle theft, bicycle theft, robbery and theft of other property. For this study, violent victimization and property victimization in the last 12 months were scored using a dichotomous yes/no format.

***Crime perpetration***

We extended the Safety Monitor with questions regarding perpetration of crime. For each crime, participants were asked whether they had committed that particular crime in the last 12 months. Violent offending consisted of: physical abuse, sexual assault and threats. Theft offending consisted of: burglary, car theft, theft from car, other motor vehicle theft, bicycle theft, robbery and theft of other property. Violent offending and theft offending in the last 12 months were scored using a dichotomous yes/no format. Prior to the assessment of crime perpetration, participants were reminded of the confidentiality of the assessment.

***Symptom severity***

*Substance use problems*

Alcohol use problems were measured with the Alcohol Use Disorder Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), a 10-item questionnaire developed by the World Health Organization (WHO). Higher scores indicate more severe alcohol use problems. The AUDIT has shown good reliability and validity in various target groups including individuals with severe mental illness (Dawe, Seinen, & Kavanagh, 2000; Maisto, Carey, Carey, Gordon, & Gleason, 2000). Drug use problems were measured with the Drug Use Disorder Identification Test (DUDIT; Berman, Bergman, Palmstierna, & Schlyter, 2005), an 11-item self-report questionnaire developed as a parallel instrument to the AUDIT. Higher scores indicate more severe drug use problems. The DUDIT has shown good reliability and validity in substance abuse populations in various treatment settings (Berman et al., 2005; Voluse et al.,

2012) and also in individuals with psychosis (Nesvag et al., 2010). In the current study in patients with dual diagnosis, internal consistency, examined by Cronbach's alpha, was excellent for the AUDIT (α = .93) and the DUDIT (α = .92).

*Psychopathology*

Psychopathology was measured with the Brief Psychiatric Rating Scale-Expanded (BPRS-E; Lukoff, Nuechterlein, & Ventura, 1986), which evaluates a broad range of psychiatric symptoms. The BPRS-E is often used as an outcome measure in psychiatric populations (Burlingame et al., 2005). This clinician-administered instrument is valid and reliable (Burlingame et al., 2005; Schutzwohl, Jarosz-Nowak, Briscoe, Szajowski, & Kallert, 2003) also in dual diagnosis patients (Lykke, Hesse, Austin, & Oestrich, 2008). In the current study, internal consistency of the BPRS-E was acceptable (α = .72).

***Psychological vulnerabilities***

*Emotion dysregulation*

Emotion dysregulation was measured with the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS is a 36-item questionnaire that evaluates emotion regulation difficulties across multiple domains: non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies and lack of emotional clarity. The DERS has high internal consistency and good test-retest reliability and construct validity in the general population and in patients with severe mental illness (Fowler et al., 2014; Gratz & Roemer, 2004; Neumann, van Lier, Gratz, & Koot, 2010). In the current study in patients with dual diagnosis, internal consistency of the DERS was excellent (α = .92).

*Interpersonal problems*

Interpersonal difficulties were measured with the Inventory of Interpersonal Problems (IIP-32; Horowitz, Alden, Wiggins, & Pincus, 2000; Vanheule, Desmet, & Rosseel, 2006), a self-report questionnaire with good internal consistency and test-retest reliability (Horowitz et al., 2000). The IIP-32 consists of 32 items scored on a 5-point rating scale ranging from 0 *(not at all)* to 4 *(extremely)* and compromises eight subscales related to different interpersonal problems: domineering/controlling, vindictive/self-centered, cold/distant, socially inhibited, non-assertive, overly accommodating, self-sacrificing, and intrusive/needy. Some of the IIP-32 subscales showed considerable correlations. The highest correlations were found for the subscales non-assertive and overly accommodating (Pearson $r$ = .72), overly accommodating and self-sacrificing (Pearson $r$ = .60), and non-assertive and socially inhibited (Pearson $r$ = .53). The lowest correlations were found for the subscales domineering/controlling and non-assertive

(Pearson $r$ = .05), domineering/controlling and overly accommodating (Pearson $r$ = .09), and intrusive/needy and socially inhibited (Pearson $r$ = .09). Similar correlations between the IIP-32 subscales were found for men and women separately. To prevent multicollinearity due to high interscale correlations, we decided to perform a principal component analysis with Varimax rotation on the 32 items of the IIP-32, which yielded four independent factors: factor 1: socially inhibited and cold/distant; factor 2: self-sacrificing and overly accommodating; factor 3: domineering/controlling; factor 4: vindictive/self-centered. The number of factors was chosen based on the scree plot. All factors have an eigenvalue of > 1.5 and the total explained variance of the factors is 49.4%. Creating five or six factors did not result in a substantially higher amount of variance explained. Items were included in a factor if they loaded > .45 on that factor and loaded < .35 on other factors. The four factors are displayed in Table 2, including factor loadings and the original subscales of the items. Since the number of items varied per factor, the score of each IIP-32 factor is calculated as the mean score of all the items in that factor. The internal consistency of the factors was good (F1 α = .81; F2 α = .82; F3 α = .76; F4 α = .73). Correlations between the new subscales were considerably lower, with the highest correlations found for F2 and F3 (Pearson $r$ = .35) and F1 and F4 (Pearson $r$ = .33).

**Ethics**

The study was reviewed, approved and monitored by the ethics committee of the Academic Medical Center of the University of Amsterdam, Amsterdam, The Netherlands (reference number 2013_260#B201441) and was conducted in accordance with the 1964 Declaration of Helsinki and its later amendments. Participation in the study was voluntary and all participants provided written informed consent.

**Statistical analysis**

Univariate logistic regression analyses were performed to identify variables associated with violent and property victimization. Subsequently, multiple logistic regression analyses were performed in order to determine which variables were independently associated with violent victimization and property victimization and to estimate the amount of variance explained (Nagelkerke $R^2$). Analyses were performed for the overall group of patients, and for men and women separately. All variables with $p$ < .10 in the univariate analyses were entered into the multiple model. Goodness-of-fit was assessed using the Hosmer-Lemeshow test. Pairwise deletion was used for missing data. Data were analyzed using SPSS Statistics 22.0.

**Table 2**

IIP-Subscales determined by principal component analysis (varimax rotation), with factor loadings and original subscales of items

| IIP-32 factor 1: socially inhibited and cold/distant | | IIP-32 factor 2: self-sacrificing and overly accommodating | | IIP-32 factor 3: domineering/ controlling | | IIP-32 factor 4: vindictive/self-centered | |
|---|---|---|---|---|---|---|---|
| 2. I find it hard to join in on groups (.68) | SI | 23. I try to please other people too much (.67) | SS | 22. I am too aggressive towards other people (.69) | D/C | 16. I find it hard to really care about other people's problems (.80) | V/S |
| 5. I find it hard to introduce myself to new people (.58) | SI | 26. I put other people's needs before my own too much (.56) | SS | 25. I try to control other people too much (.70) | D/C | 17. I find it hard to put somebody else's needs before my own (.76) | V/S |
| 9. I find it hard to socialize with others (.70) | SI | 27. I am overly generous to other people (.68) | SS | 28. I manipulate other people too much to get what I want (.72) | D/C | | |
| 19. I find it hard to ask other people to get socially with me (.70) | SI | 32. I am affected by another person's misery too much (.65) | SS | 30. I argue with other people too much (.58) | D/C | | |
| 10. I find it hard to show affection to people (.65) | C/D | 1. I find it hard to say "no" to other people (.64) | OA | 24. I want to be noticed too much (.55) | I/N | | |
| 11. I find it hard to get along with people (.68) | C/D | 31. I let other people take advantage of me too much (.69) | OA | | | | |
| 13. I find it hard to experience a feeling of love for another person (.48) | C/D | 21. I open up to people too much (.61) | I/N | | | | |

*Note.* Percent explained variance by each factor: factor 1 = 22.4%, factor 2 = 12.8%, factor 3 = 9.4%, factor 4 = 4.7%. C/D = cold/distant; D/C = domineering/controlling; IIP-32 = Inventory of Interpersonal Problems-32; I/N = intrusive/needy; OA = overly accommodating; SI = socially inhibited; SS = self-sacrificing; V/S = vindictive/self-centered.

# Results

**Clinical and psychological characteristics**

Table 3 provides the clinical and psychological characteristics of the 171 male and 72 female dual diagnosis patients. Women reported more interpersonal problems with being overly accommodating and self-sacrificing. There were no other significant gender differences in clinical and psychological characteristics. Violent offending was reported by 40.4% of the male and by 38.9% of the female dual diagnosis patients. Theft offending was reported by 26.9% of the male and by 30.6% of the female patients.

**Violent victimization**

Violent victimization was reported by 60.1% of the dual diagnosis patients: by 56.1% of the male and 69.4% of the female patients. Table 4 provides the results of the univariate logistic regression analyses for associations of violent victimization with sociodemographic, clinical and psychological characteristics. In the total group of patients, violent victimization was positively associated with younger age, homelessness, violent offending, more severe drug use problems, more severe psychopathology, a self-sacrificing and overly accommodating interpersonal style and a domineering/controlling interpersonal style. In male patients, a similar picture emerged with violent victimization being positively associated with younger age, violent offending, more severe drug use problems, more severe psychopathology, emotion dysregulation, a self-sacrificing and overly accommodating interpersonal style and a domineering/controlling interpersonal style. In female patients, a somewhat different picture emerged with violent victimization being positively associated with violent offending, and a domineering/controlling interpersonal style, and negatively associated with a socially inhibited and cold/distant interpersonal style.

**Table 3**

Clinical and psychological characteristics of dual diagnosis patients (*N* = 243)

| | | Overall (*N* = 243) | | Men (*n* = 171) | | Women (*n* = 72) | | |
|---|---|---|---|---|---|---|---|---|
| | Range | Mean | (SD) | Mean | (SD) | Mean | (SD) | *t* |
| Alcohol use problems (AUDIT) | 0-40 | 15.2 | (12.8) | 15.3 | (12.5) | 14.8 | (13.6) | 0.28 |
| Drug use problems (DUDIT) | 0-44 | 18.3 | (13.2) | 18.2 | (12.9) | 18.5 | (14.1) | -0.12 |
| Psychopathology (BPRS-E) | 24-66 | 38.4 | (8.6) | 38.6 | (9.0) | 38.0 | (7.5) | 0.44 |
| Emotion dysregulation (DERS)[a] | 44-164 | 97.9 | (24.4) | 97.0 | (24.0) | 100.1 | (25.5) | -0.92 |
| Socially inhibited and cold/distant (IIP-32 factor 1)[b] | 0-3.6 | 1.2 | (0.9) | 1.1 | (0.9) | 1.2 | (0.8) | -0.39 |
| Self-sacrificing and overly accommodating (IIP-32 factor 2)[b] | 0-4 | 2.0 | (0.9) | 1.9 | (0.9) | 2.3 | (0.9) | -2.86 ** |
| Domineering/ controlling (IIP-32 factor 3)[b] | 0-3.4 | 1.0 | (0.8) | 1.0 | (0.8) | 0.9 | (0.8) | 0.61 |
| Vindictive/self-centered (IIP-32 factor 4)[b] | 0-4 | 1.2 | (1.1) | 1.3 | (1.2) | 1.0 | (1.0) | 1.61 |

*Note.* AUDIT = Alcohol Use Disorder Identification Test; BPRS-E = Brief Psychiatric Rating Scale - Expanded; DERS = Difficulties in Emotion Regulation Scale; DUDIT = Drug Use Disorder Identification Test; IIP-32 = Inventory of Interpersonal Problems-32; SD = standard deviation.

[a] missing values for 4 participants (overall *N* = 239; men *n* = 168; women *n* = 71).

[b] mean scores per item in each factor.

* p < 0.05; ** p < 0.01; *** p < 0.001.

**Table 4**

Univariate logistic regression analyses on associations of violent victimization with sociodemographic, clinical and psychological characteristics in men and women with dual diagnosis

| | Overall (*N* = 243) | | Men (*n* = 171) | | Women (*n* = 72) | |
|---|---|---|---|---|---|---|
| | OR | [95% CI] | OR | [95% CI] | OR | [95% CI] |
| Age | 0.94*** | [0.92-0.97] | 0.93*** | [0.90-0.96] | 0.97 | [0.92-1.02] |
| Female gender | 1.78† | [0.99-3.19] | - | | - | |
| Homelessness | 2.14* | [1.11-4.12] | 1.79 | [0.87-3.72] | 7.38† | [0.90-0.45] |
| Number of inpatient days | 1.00 | [0.99-1.01] | 1.00 | [0.99-1.01] | 1.01 | [0.99-1.03] |
| Violent offending | 14.84*** | [6.93-31.78] | 17.71*** | [7.32-42.85] | 10.83** | [2.29-51.34] |
| Alcohol use problems | 1.02 | [1.00-1.04] | 1.02 | [0.99-1.05] | 1.01 | [0.97-1.05] |
| Drug use problems | 1.04** | [1.02-1.06] | 1.05*** | [1.02-1.08] | 1.01 | [0.98-1.05] |
| Psychopathology | 1.05** | [1.01-1.08] | 1.06** | [1.02-1.10] | 1.01 | [0.94-1.08] |
| Emotion dysregulation[a] | 1.01 | [1.00-1.02] | 1.02* | [1.00-1.03] | 0.99 | [0.97-1.01] |
| Socially inhibited and cold/distant | 0.79 | [0.59-1.06] | 0.91 | [0.65-1.28] | 0.47* | [0.24-0.89] |
| Self-sacrificing and overly accommodating | 1.64** | [1.22-2.22] | 1.85** | [1.29-2.66] | 1.03 | [0.57-1.86] |
| Domineering/ controlling | 1.80** | [1.16-2.56] | 1.59* | [1.08-2.36] | 3.15** | [1.35-7.33] |
| Vindictive/self-centered | 1.03 | [0.82-1.30] | 0.99 | [0.77-1.29] | 1.34 | [0.78-2.29] |

*Note.* CI = confidence interval; OR = odds ratio.
[a] missing values for 4 participants (overall *N* = 239; men *n* = 168; women *n* = 71)
† p < .10; * p < .05; ** p < .01; *** p < .001.

The multiple logistic regression analysis for violent victimization yielded a significant overall model ($p < .001$; $\chi^2 = 108.83$, $df = 8$, $R^2 = .49$). As shown in Table 5, four variables were independently associated with violent victimization in the total study population: younger age, female gender, violent offending and a self-sacrificing and overly accommodating interpersonal style. The Hosmer and Lemeshow test indicated a proper fit to the data ($p = .39$).

**Table 5**

Results of multiple logistic regression analysis for associations with violent victimization in dual diagnosis patients (*N* = 243)

| | Adjusted OR | [95% CI] |
|---|---|---|
| Age | 0.94** | [0.91-0.98] |
| Female gender | 2.10* | [1.01-4.36] |
| Homelessness | 2.17† | [0.94-5.02] |
| Violent offending | 15.48*** | [6.58-36.40] |
| Drug use problems | 1.02 | [0.99-1.05] |
| Psychopathology | 1.01 | [0.97-1.05] |
| Self-sacrificing and overly accommodating | 1.92** | [1.24-2.95] |
| Domineering/controlling | 1.05 | [0.66-1.70] |

*Note.* CI = confidence interval; OR = odds ratio.
† p < .10; * p < .05; ** p < .01; *** p < .001.

Multiple logistic regression analyses were also performed for male and female patients separately. The multiple logistic regression analysis for violent victimization in male dual diagnosis patients yielded a significant overall model ($p < .001$; $\chi^2 = 91.90$, $df = 7$, $R^2 = .56$). As shown in Table 6, three variables were independently associated with violent victimization in men: younger age, violent offending and a self-sacrificing and overly accommodating interpersonal style. The Hosmer and Lemeshow test indicated a proper fit to the data ($p = .76$). The multiple logistic regression analysis for violent victimization in female dual diagnosis patients also yielded a significant overall model ($p < .001$; $\chi^2 = 34.08$, $df = 4$, $R^2 = .53$). As shown in Table 7, four variables were independently associated with violent victimization in women: homelessness, violent offending and a domineering/controlling interpersonal style were positively associated with violent victimization, whereas a socially inhibited and cold/distant interpersonal style was a protective factor. The Hosmer and Lemeshow test indicated a proper fit to the data ($p = .17$).

**Table 6**

Results of multiple logistic regression analysis for associations with violent victimization in male dual diagnosis patients (*n* = 168)

| | Adjusted OR | [95% CI] |
|---|---|---|
| Age | 0.93** | [0.89-0.97] |
| Violent offending | 28.12*** | [8.78-90.13] |
| Drug use problems | 1.03 | [0.99-1.06] |
| Psychopathology | 1.02 | [0.97-1.07] |
| Emotion dysregulation | 0.99 | [0.97-1.01] |
| Self-sacrificing and overly accommodating | 3.23*** | [1.74-6.00] |
| Domineering/controlling | 0.61 | [0.33-1.14] |

*Note.* CI = confidence interval; OR = odds ratio.
† p < .10; * p < .05; ** p < .01; *** p < .001.

**Table 7**

Results of multiple logistic regression analysis for associations with violent victimization in female dual diagnosis patients (*n* = 72)

| | Adjusted OR | [95% CI] |
|---|---|---|
| Homelessness | 21.42* | [1.56-294.13] |
| Violent offending | 8.31* | [1.46-47.36] |
| Socially inhibited and cold/distant | 0.35* | [0.14-0.85] |
| Domineering/controlling | 5.32** | [1.67-16.92] |

*Note.* CI = confidence interval; OR = odds ratio.
† p < .10; * p < .05; ** p < .01; *** p < .001.

### Property victimization

Property victimization was reported by 58.4% of the dual diagnosis patients: by 55.0% of the male and 66.7% of the female patients. Table 8 provides the results of the univariate logistic regression analyses for associations of property victimization with sociodemographic and clinical characteristics. In the total study population, property victimization was associated with younger age, theft offending, and more severe drug use problems. In male patients, a similar picture emerged with property victimization being associated with younger age, theft offending, and more severe drug use problems. In female patients, a slightly different picture emerged with property victimization only being associated with theft offending.

**Table 8**

Univariate logistic regression analyses on associations of property victimization with sociodemographic and clinical characteristics in men and women with dual diagnosis

| | Overall (*N* = 243) | | Men (*n* = 171) | | Women (*n* = 72) | |
|---|---|---|---|---|---|---|
| | OR | [95% CI] | OR | [95% CI] | OR | [95% CI] |
| Age | 0.96** | [0.94-0.99] | 0.94*** | [0.92-0.98] | 1.01 | [0.96-1.05] |
| Female gender | 1.64† | [0.92-2.91] | - | | | |
| Homelessness | 1.03 | [0.56-1.88] | 0.77 | [0.38-1.54] | 3.67 | [0.75-17.95] |
| Number of inpatient days | 1.00 | [0.99-1.01] | 0.99 | [0.98-1.01] | 1.01 | [0.99-1.03] |
| Theft offending | 3.07** | [1.63-5.79] | 2.66** | [1.28-5.53] | 4.59* | [1.20-17.53] |
| Alcohol use problems | 1.02† | [1.00-1.04] | 1.02 | [0.99-1.04] | 1.03 | [0.99-1.07] |
| Drug use problems | 1.03** | [1.01-1.05] | 1.04** | [1.02-1.07] | 1.00 | [0.97-1.04] |
| Psychopathology | 1.02 | [0.99-1.05] | 1.02 | [0.98-1.05] | 1.05 | [0.98-1.13] |

*Note.* CI = confidence interval; OR = odds ratio.
† p < .10. * p < .05. ** p < .01. *** p < .001.

The multiple logistic regression analysis for property victimization yielded a significant overall model ($p < .001$, $\chi^2 = 26.99$, $df = 5$, $R^2 = .14$). As shown in Table 9, only one of the variables was independently associated with property victimization in the total study population: theft offending. The Hosmer and Lemeshow test indicated a proper fit to the data ($p = .62$).

**Table 9**

Results of multiple logistic regression analysis for associations with property victimization in dual diagnosis patients (*N* = 243)

| | Adjusted OR | [95% CI] |
|---|---|---|
| Age | 0.98† | [0.95-1.00] |
| Female gender | 1.74† | [0.95-3.18] |
| Theft offending | 2.18* | [1.11-4.28] |
| Alcohol use problems | 1.02† | [1.00-1.05] |
| Drug use problems | 1.02† | [1.00-1.05] |

*Note.* CI = confidence interval; OR = odds ratio.
† p < .10; * p < .05; ** p < .01; *** p < .001.

The multiple logistic regression analysis for property victimization in male dual diagnosis patients yielded a significant overall model ($p < .001$; $\chi^2 = 20.40$, $df = 3$, $R^2 = .15$). As shown in Table 10, only the variable age was independently associated with property victimization in males. The Hosmer and Lemeshow test indicated a proper fit to the data ($p = .33$).

**Table 10**

Results of multiple logistic regression analysis for associations with property victimization in male dual diagnosis patients ($n = 168$)

| | Adjusted OR | [95% CI] |
|---|---|---|
| Age | 0.96* | [0.93-0.99] |
| Theft offending | 1.91 | [0.88-4.14] |
| Drug use problems | 1.02 | [1.00-1.05] |

*Note.* CI = confidence interval; OR = odds ratio.
† p < .10; * p < .05; ** p < .01; *** p < .001.

# Discussion

In a large group of dual diagnosis patients, 60.1% reported violent victimization (physical abuse, sexual assault or threats) and 58.4% reported property victimization (burglary, robbery or theft) in the past 12 months. Females were at higher risk of being violently victimized. Furthermore, violent victimization was associated with violent offending in both male and female dual diagnosis patients. In male patients, younger age and a self-sacrificing and overly accommodating interpersonal style were related to violent victimization. In female patients, homelessness and a domineering/controlling interpersonal style were related to violent victimization, whereas being socially inhibited and cold/distant was protective against violent victimization. Property victimization was associated with theft offending in the overall group. In male patients, younger patients were at higher risk of being a victim of property crime.

Consistent with our hypothesis, younger age and female gender were found to be risk factors for violent victimization in dual diagnosis patients. This is consistent with studies in patients with substance use disorders (Stevens et al., 2007; Walton et al., 2002). Violent victimization was reported by 56.1% of the male and 69.4% of the female patients. Somewhat surprisingly, however, younger age was only related to violent victimization in male patients, not in female patients. In the general population, the risk

for violent victimization decreases with age for both males and females (Kruttschnitt, 1994; Williams & Guerra, 2008). Most studies in patients with severe mental illness or substance use disorders only report correlates of violent victimization for the total study population. Our results imply that for male dual diagnosis patients the risk for violent victimization decreases with age, while female dual diagnosis patients continue to be vulnerable for violent victimization, regardless of age.

Furthermore, consistent with our hypothesis, we found that homelessness was associated with violent victimization in female patients. However, in contrast to our hypothesis, homelessness was not associated with violent victimization in male patients. Unfortunately, most previous studies on victimization did not examine the relationship between violent victimization and homelessness for men and women separately. A possible explanation of our finding may be that homeless women are particularly prone to be victims of sexual violence (Padgett & Struening, 1992). One study in patients with mental illness in Brazil found that homelessness was associated with sexual violence in women but not in men (de Oliveira, Machado, & Guimaraes, 2012). This is in line with a review conducted in homeless patients with severe mental illness that demonstrated that homeless women are at greater risk for violent victimization compared to homeless men (Roy et al., 2014). Due to the cross-sectional design of our study, it is unclear whether homelessness preceded or followed victimization. Homelessness may lead to a greater exposure to dangerous situations, such as sleeping outside or in an unsafe shelter, and may thereby increase vulnerability for violent victimization. However, homelessness can also be a result of violent victimization, for instance due to conflicts with an intimate partner or other household members (Browne & Bassuk, 1997). In any case, the combination of being female, being seriously mentally ill and being homeless seems to place patients at very high risk for violent victimization (Goodman, Dutton, & Harris, 1995).

Consistent with our hypothesis, violent victimization was associated with violent offending in both male and female dual diagnosis patients. The "victim-offender overlap" has been observed in a broad range of study samples including patients with substance use disorders (Neale et al., 2005; Stevens et al., 2007) and patients with severe mental illness (Johnson et al., 2016; Maniglio, 2009b). Although causality cannot be derived from our study, the nature of the relationship between victimization and offending is probably multifaceted. Violent victimization can directly lead to violent offending and vice versa, for instance when violence committed by victims is motivated by self-defense or seeking revenge (Friedman, Loue, Goldman Heaphy, & Mendez, 2011). Additionally, other factors can contribute to the risk of both violent victimization and violent offending. Routine activity theory (Cohen & Felson, 1979) explains victimization

and offending at the confluence of suitable targets, offenders and the absence of capable guardians. Spending time in groups that include many offenders (e.g. fellow patients or substance users), in the absence of capable guardians (e.g. mental health professionals or police patrols) may increase opportunities for violence and thereby the likelihood for both committing an offence and experiencing victimization.

At the univariate level, consistent with our hypothesis, we found that severity of substance use problems and severity of psychopathology were related to violent victimization in the overall group and in male patients. However, these associations disappeared when other variables were added to the model. According to the literature, substance use is related to both violent offending and violent victimization (Goldstein, 1985), also in patients with severe mental illness (Johnson et al., 2016). Possibly, in our study, severity of substance use problems correlated with violent offending and therefore did not independently contribute to the explanation of violent victimization in patients with dual diagnosis.

In male patients, a self-sacrificing and overly accommodating interpersonal style was associated with violent victimization. People with this interpersonal style rely on connection at the expense of autonomy. They overaccommodate to the needs and wants of others and sacrifice their own desires, describing themselves as too forgiving and trusting, excessively submissive and easily taken advantage of (Horowitz et al., 2000). One study in university students found that in males, childhood physical abuse was related to being self-sacrificing in adult couple relationships (Paradis & Boucher, 2010). Unfortunately, to the best of our knowledge, there are no previous studies that have examined the link between this type of interpersonal problems and vulnerability to adult violent victimization. From a routine activity theory perspective one could argue that patients with this interpersonal style are at higher risk of violent victimization because being too trusting and easily taken advantage of may make them suitable targets for motivated offenders (Cohen & Felson, 1979).

In contrast to our hypothesis, in female patients, we did not find a relationship between violent victimization and severity of substance use problems, severity of psychopathology and emotion dysregulation. However, as hypothesized, we did find a link with specific domains of interpersonal problems. A domineering/controlling interpersonal style was found to be associated with violent victimization in female patients. People with this interpersonal style describe themselves as manipulative and aggressive towards others and find it difficult to relax control over people (Horowitz et al., 2000). Our findings are consistent with previous results reporting a link between high levels of aggression and hostility and violent victimization in

psychiatric outpatients (Stepp et al., 2012). Domineering/controlling individuals may lack the social skills to successfully settle disagreements. Trying to control or influence others may provoke irritation and anger and lead to tense situation that can ultimately escalate into violence. Furthermore, a domineering/controlling interpersonal style may presage the participation in intimate relationships characterized by hostile, controlling and potentially violent interactions (Murphy & Blumenthal, 2000). In male patients, a domineering/controlling interpersonal style was not independently related to violent victimization. This may be explained by previous research in the field of social psychology demonstrating that women are criticized more than men for expressing identical dominance behaviors (Williams & Tiedens, 2016). Explicit, direct forms of dominance, such as demanding something of others, led to less likeability in women compared to men. Furthermore, aggressive behavior is evaluated more negatively in women compared to men (Barber, Foley, & Jones, 1999). Possibly, in female dual diagnosis patients, a domineering/controlling interpersonal style provokes a reaction, whereas for male patients aggressive and controlling behaviors are more accepted.

Interestingly, we found that being socially inhibited and cold/distant, together reflecting a socially avoidant interpersonal style, was negatively associated with violent victimization in female patients. This is consistent with research demonstrating that higher levels of interpersonal sensitivity protected psychiatric outpatients from being violently victimized (Stepp et al., 2012). Socially inhibited and cold/distant individuals feel anxious and timid in the presence of others and have the tendency to avoid social situations. Having difficulty socializing with others, joining groups and meeting new people is generally considered to be a deficit. Apparently, however, a socially avoidant interpersonal style is related to a lower risk of victimization, at least in female patients with dual diagnosis. Crimes are more prevalent in patients who spend a lot of time with other substance users (Skjaervo, Skurtveit, Clausen, & Bukten, 2016). Patients who are socially inhibited may seek less interaction with individuals who are prone to engage in violent behavior and therefore be at lower risk of victimization, simply because there are fewer opportunities to be victimized. Another explanation of the link between social inhibition and victimization can be found in neuroimaging studies. The amygdala plays an important role in processing socially relevant cues such as determining the trustworthiness of faces (Bzdok et al., 2011). This subcortical brain structure seems to function as a protection device, which evaluates threatening environmental stimuli and thereby helps to avoid danger (Amaral, 2002). Socially inhibited persons show increased amygdala activity during subjective ratings of internal fear while looking at emotional faces (Perez-Edgar et al., 2007). Possibly, potentially threatening persons and situations are processed differently in socially inhibited patients and thereby result in higher internal fear, compared to patients with less social inhibition.

Consistent with our hypothesis, we found that property victimization was related to theft offending. This is in line with a study in a representative sample of the Dutch population that indicated an overlap between offenders and victims of property crime (Wittebrood & Nieuwbeerta, 1999) The authors reported a weaker victim-offender overlap for property crimes (OR = 3.90) compared to violent crimes (OR = 15.21), which is in line with our findings. People who use drugs are more likely to commit property crimes than those who do not, motivated by income-raising to support their drug use (Bennett, Holloway, & Farrington, 2008). The lifestyle or routine activities of dual diagnosis patients who commit property crimes may make them more likely to be victimized themselves. Furthermore, drug users, especially those who have committed property crimes themselves, are not inclined to report incidents to the police (Traverso & Bagnoli, 2001). This may make them a suitable target, since burglars and robbers can commit crime with lower probability of detection. At the univariate level, we found that property victimization was associated with younger age and higher severity of drug use problems in the total study population and in male patients, but not in female patients. In the total study population these associations disappeared when other variables were added to the model. According to the literature, younger age is related to theft offending in drug users (Horyniak et al., 2014). Possibly, in our study, both younger age and severity of drug use problems were correlated with theft offending and therefore did not independently contribute to the explanation of property victimization in patients with dual diagnosis. In male patients, the associations between property victimization and theft offending and drug use problems disappeared in the multiple regression model, and only younger age remained as an independent predictor of property victimization, suggesting that younger males are at greater risk to be victims of property crime. A study in de US general population showed that the relationship between age and property victimization is partly mediated by routine activities indicative of a high exposure lifestyle, such as more night activity (Bunch, Clay-Warner, & Lei, 2015). Unfortunately, this study did not report results for males and females separately. Possibly, young male patients with dual diagnosis are at increased risk of property victimization due to risky lifestyle activities resulting in more interaction with potential offenders in the absence of capable guardians. The small amount of variance explained by our models indicates a role of other factors in predicting property victimization in male and female dual diagnosis patients.

Finally, neither violent nor property victimization was significantly associated with the number of inpatient days in the 90 days prior to assessment. From a routine activity theory perspective, one could argue the risk of victimization is expected to be lower when a patient is admitted in an inpatient care facility since there is greater oversight and supervision, assuming there are more capable guardians who discourage potential

offenders from perpetrating a crime. On the other hand, a clinic is not necessarily the safest environment, since patients may spend more time with motivated offenders, which is supported by a recent study in our cohort showing that 9.7% of the most recent incidents of physical abuse and 18.5% of the most recent incidents of sexual assault were perpetrated by a fellow patient (de Waal, Dekker, Kikkert, et al., 2017).

**Limitations**

This study has both strengths and limitations. The most important strengths are the large sample of patients with dual diagnosis and the broad range of risk factors for victimization that were measured with validated instruments. However, the study also has several limitations. First, the assessment of victimization may be influenced by memory bias. However, face-to-face assessments tend to be more accurate compared to police reports, which are likely to underestimate victimization rates (Rand & Catalano, 2007). Second, only treatment-seeking dual diagnosis patients were included in this study, which may limit the generalizability of our findings. Third, the amount of variance explained by our statistical models indicates a potential role of factors we did not measure in predicting violent and property victimization in dual diagnosis patients. For instance, previous research demonstrated that rates of childhood abuse and PTSD are high in dual diagnosis patients and may lead to an elevated risk to be revictimized in adulthood (Gearon, Kaltman, Brown, & Bellack, 2003). Childhood abuse could have led to the interpersonal problems that we have found to be related to adult victimization (Huh et al., 2014). Effectively treating PTSD in dual diagnosis patients may contribute to the prevention of future victimization. Unfortunately, we were unable to examine this relationship in the current study. Fourth, the number of inpatient days was only measured in the 90 days before assessment, while victimization was measured in the 12 months before assessment. Finally, due to the cross-sectional design of the study, we are unable to prove causality. It is unclear whether offending increases the risk of victimization or vice versa. The link could also be bi-directional or other unknown factors could lead to a higher risk of both victimization and offending. The same applies to the association of violent victimization with homelessness and interpersonal problems. Prospective studies are needed to provide a better understanding of the underlying mechanisms.

**Recommendations**

Given the high prevalence of victimization in dual diagnosis patients and its related problems, preventive interventions should be developed. Our findings suggest that training focused on interpersonal skills may help to diminish vulnerability for victimization. It has been demonstrated that social skills can effectively be improved in dual diagnosis patients (Bellack, Bennett, Gearon, Brown, & Yang, 2006). Interventions

and community initiatives targeting crime reduction usually have separate strategies for victims and offenders. However, our findings indicate that more success may be achieved by targeting individuals who are prone to be victims as well as perpetrators of crime. More specifically, skills training could focus on expanding awareness about risk factors for victimization, increasing safety in routine activities and mastering skills with regard to preventing, handling and leaving conflict situations. In addition, our findings indicate that preventive interventions may be more beneficial if they incorporate gender-specific elements, for example for male patients who are inclined to be submissive and too trusting in social situations and for female patients who are inclined to be aggressive, manipulative and controlling in social situations. Since it is impossible to fully rule out the risk of victimization, it would also be helpful to teach patients healthy ways to cope with victimization incidents and prevent aggravation of symptomatology. First attempts to develop interventions to prevent victimization and test effectiveness in randomized controlled trials are made (de Waal et al., 2015; van der Stouwe et al., 2016).

# Chapter 5

## Criminal offending and associated factors in dual diagnosis patients

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## Abstract

Dual diagnosis patients perpetrate crime more often than healthy individuals. Crime perpetration has major mental health consequences for the victim. Knowledge of factors related to perpetration is needed for the development of prevention programs. However, in dual diagnosis patients, very little is known about factors explaining criminal behavior. The current study investigated cross-sectional associations between demographic and clinical factors and perpetration of three crime types (violence, threat, and property crime) in 243 treatment-seeking dual diagnosis patients. In our sample, perpetration of violence was independently associated with younger age, severity of alcohol use problems, lifetime trauma exposure, and higher manic symptom scores. Expression of threat was independently associated with severity of alcohol use problems and higher manic symptom scores. Perpetration of property crime was independently associated with severity of alcohol and drug use problems. Remarkably, gender was not associated with any type of perpetration. These findings indicate that criminal offending is a significant problem among dual diagnosis patients and are a first step towards understanding the complex causal networks that lead to criminal perpetration. Future longitudinal research should investigate additional risk factors and establish causality to support the development of treatment programs to prevent criminal offending by dual diagnosis patients.

# Introduction

Suffering from a mental illness is strongly associated with suffering from a co-occurring drug or alcohol use disorder (Kessler, 2004). Patients diagnosed with both a mental health and substance use disorder are referred to as dual diagnosis patients. Research has consistently shown that suffering from dual diagnosis is related to poor clinical and social outcomes, such as medication non-adherence, relapse, treatment resistance, suicide, homelessness and incarceration (Carrà et al., 2015; Drake et al., 1991; Hunt et al., 2013; Wallace, Mullen, & Burgess, 2004). Furthermore, dual diagnosis patients have an elevated risk to perpetrate crime (Swanson, Holzer, Ganju, & Jono, 1990). Criminal perpetration has major mental health consequences for the victim, such as depression, posttraumatic stress disorder and increased anxiety (Brown & Harris, 1989; Chon & Wilson, 2016; Krug, Dahlberg, Mercy, Zwi, & Lozano, 1996; Robinson & Keithley, 2000). In addition, dual diagnosis patients who perpetrate crime are at elevated risk to be victimized themselves (de Waal et al., 2018).

Crime is often subdivided in violent crime and property crime in the literature. In this study we additionally consider *threat,* defined by the Oxford English Dictionary as a communicated intent to inflict harm or loss on another person, as a separate type of crime. Criminological research has established several factors that are associated with criminal offending in the general population. Two of the most robust findings are that 1) crime perpetration is more prevalent in men compared to women and 2) crime perpetration decreases with age. Both these relationships have shown to be stable in several historical periods, across geographic locations and among all crime types (Gottfredson & Hirschi, 1990; Hirschi & Gottfredson, 1983). Moreover, drug use (Bennett et al., 2008) and alcohol use have consistently been associated with perpetration of crime in the general population (Bennett et al., 2008; Murdoch, Pihl, & Ross, 1990). Another factor that has been linked to perpetration of crime is mental illness (Hodgins, 1992, 1996), although several studies have estimated that only 4-12% of all arrests are directly attributable to mental illness (Junginger, Claypoole, Laygo, & Crisanti, 2006; Monahan et al., 2001; Peterson, Skeem, Kennealy, & Bray, 2014). Other risk factors for criminal perpetration are a history of criminal behavior (Andrews & Bonta, 1994), homelessness (Levitt, Culhane, & DeGenova, 2009) and trauma exposure in early or later life (McCord, 1983; Widom & Maxfield, 1996).

To the best of our knowledge, little is known about factors that explain criminal perpetration by dual diagnosis patients. Research has however established certain factors that are associated with criminal perpetration in patients with substance use disorders or severe mental illness (SMI). Male gender (Chermack, Walton, Fuller, & Blow,

2001), non-Caucasian race (Chermack, Fuller, & Blow, 2000) and severity of alcohol (Stith, Crossman, & Bischof, 1991) and drug use problems (Schuckit & Russell, 1984) have been associated with violent crime perpetration by patients with substance use disorders. With regard to criminal perpetration in the SMI population, Witt, van Dorn, and Fazel (2013) systematically reviewed 110 studies in patients with psychosis and found that male gender, non-white ethnicity, lower socio-economic status, homelessness, history of violent victimization, childhood abuse, higher general psychopathology symptom scores, comorbid substance use disorder and recent misuse of alcohol or drugs were associated with perpetration of violence. Despite strong associations between SMI and criminal perpetration, only a small proportion of crimes can be directly related to psychiatric symptoms. More specifically, symptoms of bipolar disorder have been found to be more strongly related to crime perpetration compared to symptoms of depression or schizophrenia spectrum disorders (Peterson et al., 2014). Evidence is inconsistent about the direct relationship between psychotic symptoms and criminal behavior. Some studies suggest that a small part of criminal events can be directly linked to psychotic symptoms (Monahan et al., 2001), whereas other studies suggest a small protective effect of psychotic symptoms (Prins, Skeem, Mauro, & Link, 2015).

Despite ample research on the prevalence of criminal perpetration among patients with dual diagnosis compared with other populations (Scott, Johnson, Menezes, Thornicroft, & Marshall, 1998; Wright, Gournay, Glorney, & Thornicroft, 2002), studies investigating factors that are associated with criminal perpetration in this specific population are lacking. Previous research has been conducted in either patients with SMI or patients with substance use disorders and mainly focuses on violent perpetration, rather than threat and property crime. Research that aims to explain criminal perpetration by dual diagnosis patients is desirable, since it could contribute to future longitudinal research, subsequently enabling the development or refinement of specific prevention and treatment programs, with potential benefit to victims and perpetrators with dual diagnosis.

This cross-sectional study aimed to identify demographic and clinical factors that are associated with crime perpetration in dual diagnosis patients. We constructed three statistical models, identifying factors that explain perpetration of violent crime, threats and property crime. Based on extensive research in the general population, we hypothesize that younger age and male gender are associated with perpetration of all three types of crime. Furthermore, we hypothesize that perpetration of violent crime is associated with homelessness, symptoms of mania, severity of alcohol and drug use problems and prior victimization. Since in some studies threat is included in the definition of violent crime, we tentatively hypothesize that threat is associated with

the same factors as violent crime perpetration. Finally, due to increased prevalence in patients with substance use disorder, we hypothesize that perpetration of property crime is associated with severity of drug use problems and homelessness.

# Methods

**Study design and participants**

This cross-sectional study used baseline data from a randomized controlled trial that investigates the effectiveness of an intervention aimed at reducing victimization in dual diagnosis patients using group therapy (de Waal et al., 2015). The study was approved by the ethics committee of the Amsterdam University Medical Center of the University of Amsterdam, the Netherlands. The target population consisted of individuals 18 years of age or older, suffering from at least one mental disorder on the DSM-IV Axis I or II other than substance use disorder, with comorbid substance dependence or substance abuse according to DSM-IV. Patients were excluded from participation if they had insufficient understanding of the Dutch language or were not eligible for group therapy according to their case manager. Written informed consent was obtained from all participants. Participants were recruited at an inpatient as well as outpatient site from a psychiatric service in Amsterdam, the Netherlands (Arkin Mental Health Care, division Mentrum) where patients are treated for both substance use disorders and mental disorders. Recruitment took place from April 2014 until April 2016. In this period, all participants who fulfilled the criteria were informed about the study and invited to participate. An assessment was performed by one of five researchers (one with a master's degree, four trained master's degree students in clinical psychology) in a face-to-face setting at the treatment facility. Confidentiality was assured at the start of the assessment. Participation was rewarded with €15 cash.

**Measures**

In order to assess perpetration of crime within the past twelve months, we used self-designed dichotomous yes/no questions. The questions were developed in accordance with the Dutch 2011 Veiligheidsmonitor (Safety Monitor), which is the Dutch equivalent of the International Crime Victims Survey (Killias, 2010) and has been developed by the Dutch Ministry of Security and Justice. There are no psychometric properties available. Perpetration was measured by assessing various crimes, subdivided in three categories: (1) violent crimes, consisting of physical abuse and sexual assault; (2) threat; and (3) property crimes, consisting of burglary, car theft, theft from car, other motor vehicle theft, bicycle theft, robbery, and theft of other property. Physical abuse was defined as physically attacking or being physically abusive. Sexual assault was

defined as touching or grabbing in an offensive way with sexual intentions. Threat was defined as threatening somebody with hitting, kicking, a pistol, a knife, or something similar, without being physically attacking or abusive. For each crime, participants were asked whether they had ever been a perpetrator of that particular crime (e.g. "have you ever attacked, hit, kicked, or physically abused someone?"), and if yes, whether this had also happened in the past 12 months. Moreover, the assessment contained an extra reminder of confidentiality and anonymous data management. Researchers who conducted the assessments explained to participants that they were working for a separate research department, were not involved in patient care, would not report in electronic patient files and that patients answers would not influence their treatment in any way.

Demographic characteristics were obtained from all participants. Based on prior research we included measures of age, gender and homelessness in our bivariate analyses. Homelessness was defined as the absence of permanent residence at the time of assessment. Temporary stays in (psychiatric) care facilities and homeless shelters were not considered permanent residence.

Severity of alcohol use problems in the twelve months prior to assessment was examined with the Alcohol Use Disorders Identification Test (AUDIT; Saunders et al., 1993). This tool was developed by the World Health Organization and consists of 10 items, scored on a 5-point scale. Sum scores range from zero to 40. Higher sum scores suggest more serious alcohol use problems. The AUDIT has good reliability and validity in individuals with SMI (Dawe et al., 2000). In the current study AUDIT showed an excellent internal consistency, examined by Cronbach's α ($\alpha$ = 0.93). Severity of drug use problems in the twelve months prior to assessment was examined with the Drug Use Disorders Identification Test (DUDIT; Berman et al., 2005), which is a parallel instrument to the AUDIT. The DUDIT is an 11 item self-report questionnaire, scored on a 5-point scale. Sum scores range from zero to 44. Higher sum scores suggest more serious drug use problems. The DUDIT has good reliability and validity in individuals suffering from psychosis (Nesvag et al., 2010) and substance use disorder (Berman et al., 2005). In the current sample DUDIT showed an excellent internal consistency ($\alpha$ = 0.92). Both the AUDIT and the DUDIT were performed through a face-to-face interview.

Psychiatric symptoms in the past month were measured with the Brief Psychiatric Rating Scale – Expanded (BPRS-E; Lukoff et al., 1986), which consists of 24 symptoms. Items were grouped in four subscales: manic excitement/disorganization, depression/anxiety, positive symptoms, and negative symptoms, as proposed by Ruggeri et al. (2005). The clinician-administered instrument is valid and reliable in patients with dual diagnosis

(Lykke et al., 2008). In the current sample the BPRS-E subscales showed an internal consistency, examined by Cronbachs α, of .47 (manic excitement/disorganization), .62 (positive symptoms), .51 (negative symptoms), and .73 (depression/anxiety).

Lifetime trauma exposure was investigated with the Jellinek Posttraumatic Stress Disorder Screening Questionnaire (J-PTSD; van Dam, Ehring, Vedel, & Emmelkamp, 2013). The dichotomous variable lifetime trauma exposure (yes/no) was scored positively when a participant self-reported having ever experienced or witnessed a traumatic event, such as physical violence, sexual assault, threats, a severe accident, disaster or war.

**Statistical analysis**

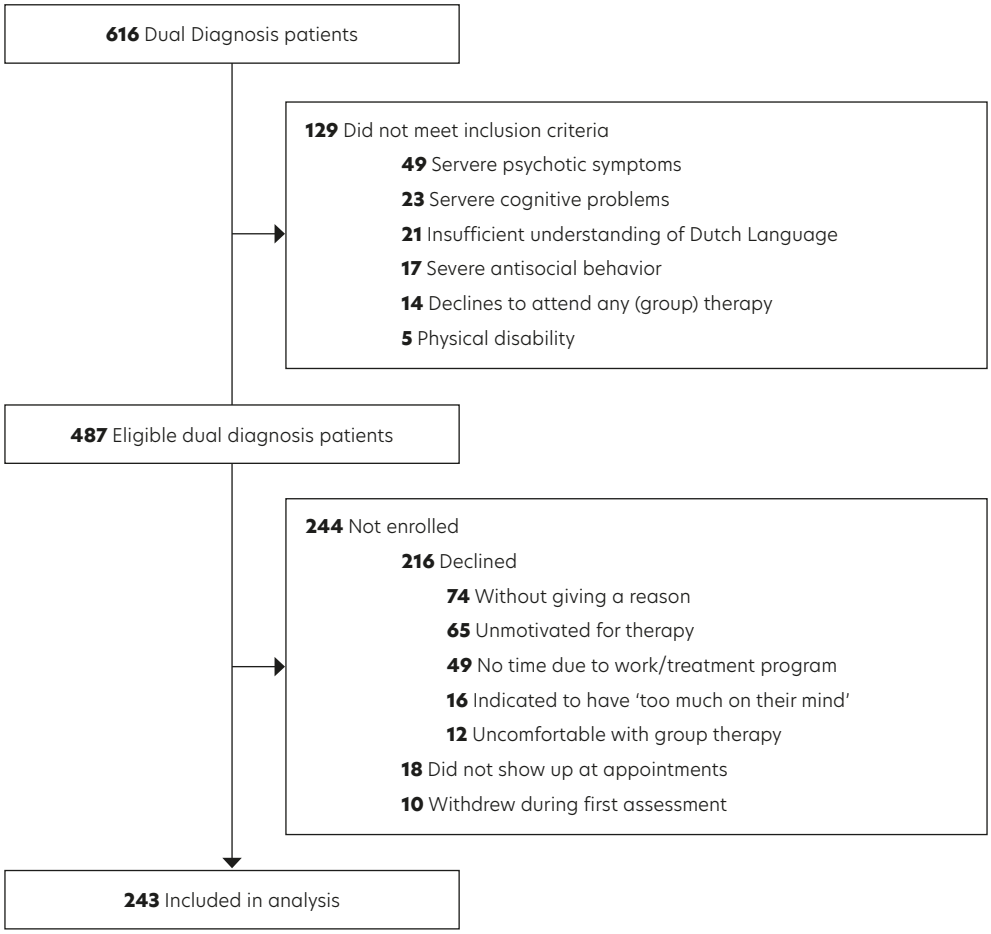
Continuous variables were tested for normality. Normally distributed variables were reported with mean and standard deviation (SD), whether non-normally distributed variables were presented using the median and inter quartile range (IQR). We used bivariate logistic regression in order to determine associations between recent perpetration of violent crime, threat and property crime and independent variables. We subsequently performed three multivariable logistic regression analyses, creating the best models to understand perpetration of violent crime, threat and property crime. All variables with $p < 0.1$ in bivariate regression were forced into the multivariable models using the forced entry method. We checked for multicollinearity in all three models. Independent relations were considered significant when $p < .05$ in the multivariable models. Explained variance was reported utilizing $R^2$ (Nagelkerke) and model fit was evaluated using the Hosmer-Lemeshow goodness of fit test. Statistical analyses were performed using R studio version 0.99.892.

# Results

**Sample characteristics**

As shown in Figure 1, 616 patients with dual diagnosis were available for participation in the participating care facilities. However, 129 individuals were not eligible for study participation, mostly due to severe psychotic or cognitive problems, insufficient understanding of the Dutch language or severe antisocial behavior. Of the remaining 487 eligible patients, 244 patients refused to participate or did not show up or withdrew from the first assessment. Consequently, 243 participants were included in the study. The sample was comparable to the general patient population of the participating care facilities with respect to age and number of psychiatric diagnoses.

**Figure 1.** Flow of participant enrollment.




The sample consisted mainly of male participants ($n$ = 171, 70.4%) who were predominantly born in the Netherlands ($n$ = 178, 73.3%) and predominantly had a permanent residence ($n$ = 187, 77.0%). The majority of participants were receiving inpatient care at the time of the assessment, but only 6.6% of the participants had been receiving inpatient care for longer than the last three months. The mean age of participants was 42 years (mean = 42.3, $SD$ = 10.9, range = 18-70). 82% Of the participants reported lifetime trauma exposure ($n$ = 200, 82.3%). The predominant substance use disorder was alcohol use disorder ($n$ = 154, 63.4%) and the predominant psychiatric disorders were psychotic disorder ($n$ = 93, 38.3%) and personality disorder ($n$ = 90, 37.0%). The majority of the sample reported offense of one or more crimes within the twelve months prior to the assessment ($n$ = 126, 51.9%). Table 1 displays all sample characteristics.

**Table 1**

Sample characteristics

| | Total sample (*N* = 243) | |
|---|---|---|
| Gender, *n* (%) | | |
| Male | 171 | (70.4) |
| Female | 72 | (29.6) |
| Age, years, mean (SD) | 42.3 | (10.9) |
| Country of birth | | |
| The Netherlands | 178 | (73.3) |
| Europe, other than NL | 15 | (6.2) |
| Suriname | 15 | (6.2) |
| Morocco | 11 | (4.5) |
| Netherlands Antilles | 6 | (2.5) |
| Other | 18 | (7.4) |
| Permanent residence, *n* (%) | 187 | (77.0) |
| Type of care at assessment, *n* (%) | | |
| Inpatient | 163 | (68.1) |
| Outpatient | 80 | (32.9) |
| Paid job, *n* (%) | 17 | (7.0) |
| DSM-IV substance use disorder[a], *n* (%) | | |
| Alcohol | 154 | (63.4) |
| Cannabis | 112 | (46.1) |
| Cocaine | 107 | (44.0) |
| Opioid | 56 | (23.0) |
| Sedatives | 49 | (20.2) |
| Other substances | 33 | (15.6) |
| DSM-IV Axis I disorder, other than SUD[a], *n* (%) | | |
| None | 40 | (16.5) |
| Psychotic disorder | 93 | (38.3) |
| Mood disorder | 54 | (22.2) |

*table continues*

| | | |
|---|---|---|
| Anxiety disorder | 52 | (21.4) |
| Attention-deficit/hyperactivity disorder | 20 | (8.2) |
| Other disorder | 28 | (11.5) |
| DSM-IV personality disorder, *n* (%) | | |
| None or deferred | 153 | (63.0) |
| Personality disorder | 90 | (37.0) |
| DSM-IV intellectual disability, *n* (%) | | |
| None or deferred | 212 | (87.2) |
| Intellectual disability | 31 | (12.8) |
| Lifetime trauma exposure (J-PTSD), *n* (%) | 200 | (82.3) |
| Criminal offending[a,b], *n* (%) | | |
| Violent crime | 57 | (23.5) |
| Threat | 67 | (27.6) |
| Property crime | 68 | (28.0) |
| Alcohol use problems (AUDIT), median (IQR) | 13 | (3-27) |
| Drug use problems (DUDIT), median (IQR) | 19 | (4.5-29) |
| Psychopathology (BPRS-E), median (IQR) | 37 | (32-43) |
| Number of diagnoses, median (IQR) | 4 | (3-4) |

*Note.* AUDIT = Alcohol Use Disorder Identification Test; BPRS-E = Brief Psychiatric Rating Scale - Expanded; DSM-IV = Diagnostic and Statistical Manual of Mental disorders, 4th edition; DUDIT = Drug Use Disorder Identification Test; IQR = interquartile range; J-PTSD = Jellinek PTSD screening tool; NL = the Netherlands; SD = standard deviation; SUD = substance use disorder.

[a] can include multiple counts.

[b] in the 12 months prior to assessment.

The number of violent offenses perpetrated by one individual ranged from 1 to 10 within the twelve months prior to assessment among those who reported to have perpetrated violent crime. Among those who reported to have expressed threats in the twelve months prior to assessment, the number of threats expressed by one individual ranged from 1 to 365. The number of property crimes perpetrated by one individual ranged from 1 to 365 among those who reported property crime perpetration. There were no data missing for any of the characteristics.

As displayed in Table 1, participants can suffer from multiple mental and substance use disorders. Likewise, some participants have reported criminal offenses of multiple

crime categories. Figure 2 shows the number of participants that self-reported violent crime, threat or property crime perpetration and the overlap between the three crime types.

**Figure 2.** Overlap between violent crime, expression of threat and property crime perpetration in dual diagnosis patients (*N* = 243).

**Factors associated with perpetration of violent crime**

Table 2 displays bivariate associations for perpetration of violent crime, expression of threat and perpetration of property crime. Factors found to be associated with violent crime perpetration in the previous year included younger age (OR 0.960, $p$ = .005), severity of alcohol use problems (OR 1.029, $p$ = .017), severity of drug use problems (OR 1.027, $p$ = .025), lifetime traumatic events (OR 4.932, $p$ = .005), and BPRS-E manic excitement/disorganization (OR 1.114, $p$ = .021).

**Table 2**

Bivariate associations with perpetration of violent crime, threat and property crime in dual diagnosis patients (*N* = 243)

| | Violent crime | | Threat | | Property crime | |
|---|---|---|---|---|---|---|
| | OR | [95% CI] | OR | [95% CI] | OR | [95% CI] |
| Female gender | 0.719 | [0.336-1.469] | 1.119 | [0.608-2.060] | 1.196 | [0.653-2.190] |
| Age | 0.960** | [0.932-0.987] | 0.977† | [0.951-1.003] | 0.956** | [0.929-0.982] |
| Homelessness | 1.798 | [0.927-3.487] | 1.487 | [0.782-2.930] | 1.983* | [1.055-3.728] |
| Alcohol use problems (AUDIT) | 1.029* | [1.005-1.053] | 1.032** | [1.010-1.056] | 1.022* | [1.000-1.045] |
| Drug use problems (DUDIT) | 1.027* | [1.004-1.051] | 1.020† | [0.999-1.043] | 1.050*** | [1.027-1.076] |
| Lifetime traumatic event (J-PTSD) | 4.932** | [1.465-16.605] | 1.543 | [0.696-3.419] | 1.005 | [0.482-2.094] |
| BPRS-E positive symptoms | 1.034 | [0.947-1.121] | 1.043 | [0.961-1.128] | 1.008 | [0.924-1.091] |
| BPRS-E negative symptoms | 0.978 | [0.844-1.108] | 0.922 | [0.790-1.050] | 1.004 | [0.883-1.128] |
| BPRS-E manic excitement/ disorganization | 1.114* | [1.016-1.222] | 1.169*** | [1.069-1.282] | 1.071 | [0.980-1.170] |
| BPRS-E depression/ anxiety | 1.043 | [0.961-1.128] | 1.056† | [1.000-1.116] | 1.009 | [0.955-1.066] |

*Note.* AUDIT = Alcohol Use Disorder Identification Test; BPRS-E = Brief Psychiatric Rating Scale - Expanded; CI = confidence interval; DUDIT = Drug Use Disorder Identification Test; J-PTSD = Jellinek PTSD screening tool; OR = odds ratio.
† p < .10; * p < .05; ** p < .01; *** p < .001.

Table 3 displays the results from the multivariable logistic regression of perpetration of violent crime. There was no multicollinearity between any of the variables in the model. Younger age (OR 0.964, $p$ = .026), severity of alcohol use problems (OR 1.032, $p$ = .014), BPRS-E manic excitement/disorganization (OR 1.130, $p$ = .017) and lifetime trauma exposure (OR 5.458, $p$ = .009) were independently associated with perpetration of violent crime. The explained variance was 18.8% (Nagelkerke $R^2$). The Hosmer-Lemeshow goodness of fit test indicated appropriate model fit ($p$ = .991).

**Table 3**

Logistic regression model of factors associated with violent crime perpetration

| | OR | [95% CI] |
|---|---|---|
| Age | 0.964* | [0.933 - 0.995] |
| Alcohol use problems | 1.032* | [1.006 - 1.058] |
| Drug use problems | 1.023 | [0.997 - 1.050] |
| Manic excitement/disorganization | 1.130* | [1.021 - 1.251] |
| Lifetime trauma exposure | 5.458** | [1.769 - 24.303] |

*Note.* Model: chi-square = 32.471, $df = 5$, $p < .001$, Nagelkerke $R^2 = .188$. CI = confidence interval; OR = odds ratio. * p < .05; ** p < .01; *** p < .001.

## Factors associated with expression of threat

Factors found to be associated with the expression of threat in bivariate analysis were severity of alcohol use problems score (OR 1.032, $p = .005$) and BPRS-E manic excitement/disorganization (OR 1.169, $p < .001$), as displayed in Table 2. Table 4 displays the results from the multivariable logistic regression model of the expression of threat. There was no multicollinearity between any of the variables in the model. Severity of alcohol use problems (OR 1.035, $p = .005$) and BPRS-E manic excitement/disorganization (OR 1.160, $p = .002$) were independently associated with the expression of threat. The explained variance was 14.8% (Nagelkerke $R^2$). The Hosmer-Lemeshow goodness of fit test indicated adequate fit to the data ($p = .148$).

**Table 4**

Logistic regression model of factors associated with expression of threat

| | OR | [95% CI] |
|---|---|---|
| Age | 0.984 | [0.955 - 1.013] |
| Alcohol use problems | 1.035** | [1.011 - 1.061] |
| Drug use problems | 1.023 | [0.998 - 1.049] |
| Manic excitement/disorganization | 1.160** | [1.056 - 1.279] |
| Depression/anxiety | 1.018 | [0.959-1.081] |

*Note.* Model: chi-square = 26.250, $df = 5$, $p < .001$, Nagelkerke $R^2 = .148$. CI = confidence interval; OR = odds ratio. * p < .05; ** p < .01; *** p < .001.

**Factors associated with perpetration of property crime**

Factors found to be associated with perpetration of property crime were younger age (OR 0.956, $p$ = .001), severity of alcohol use problems (OR 1.022, $p$ = .048), severity of drug use problems (OR 1.050, $p$ < .001), and homelessness (OR 1.983, $p$ = .041), as displayed in Table 2. Table 5 displays the results from the multivariable logistic regression model of perpetration of property crime. There was no multicollinearity between any of the variables in the model. Severity of alcohol use problems (OR 1.035, $p$ = .005) and severity of drug use problems (OR 1.051, $p$ < .001) were independently associated with perpetration of property crime. The explained variance was 18.5% (Nagelkerke $R^2$). The Hosmer-Lemeshow goodness of fit test indicated appropriate model fit ($p$ = .338).

**Table 5**

Logistic regression model of factors associated with perpetration of property crime

| | OR | [95% CI] |
|---|---|---|
| Age | 0.978 | [0.948 - 1.008] |
| Homelessness | 1.682 | [0.835 - 3.351] |
| Alcohol use problems | 1.035** | [1.011 - 1.061] |
| Drug use problems | 1.051*** | [1.025 - 1.079] |

*Note.* Model: chi-square = 33.419, $df$ = 4, $p$ < .001, Nagelkerke $R^2$ = .185. CI = confidence interval; OR = odds ratio.
* p < .05; ** p < .01; *** p < .001.

# Discussion

**Main findings and context of prior research**

This cross-sectional study aimed to find factors that are associated with criminal perpetration by dual diagnosis patients. From a sample of 243 dual diagnosis patients, in which the prevalence of self-reported criminal perpetration in the past twelve months was 51.9%, a number of key findings emerged.

Firstly, gender was not independently associated with any type of criminal offending in the current study. This is in contrast with studies in patients with psychosis (Witt et al., 2013) and in the general population (Gottfredson & Hirschi, 1990) which show that male gender is associated with criminal offending. A possible explanation for the absence of a gender effect in our study is that mental illness and substance use disorder are more strongly related with criminal behavior in women than in men. This theory is

supported by a review that suggests that mental illness and drug use disorder are more prevalent in imprisoned women than in men (Fazel & Baillargeon, 2011). Another study shows that offenders among dual diagnosis patients are more often women than among offenders with a SMI alone (Hartwell, 2004). A second possible explanation for the absence of a gender effect is the relatively high rate of female patients with a personality disorder in our sample (61.1% of women vs. 26.9% in men; de Waal, Dekker, Kikkert, et al., 2017). Personality disorder is conceived to be associated with criminal behavior, since the majority (60-70%) of the prison population meets criteria for at least one personality disorder (Singleton, Meltzer, Gatward, Coid, & Deasy, 1998).

Second, in contrast with our hypothesis, no independent association was found between homelessness and any type of criminal perpetration. This is in contrast with a review of studies conducted in individuals with psychosis, reporting an association between recent homelessness and risk of violence with a pooled odds ratio of 2.3 (Witt et al., 2013). Most studies included in this review have been conducted in the United States. Possibly, being homeless contributes less to risk of offending in the Netherlands due to the extensive social security system for homeless people compared to other countries such as the United States, with general assistance for all legal residents and larger availability of mental health services, community programs, and shelters (Sleegers, 2000). At the bivariate level, homelessness was significantly associated with perpetration of property crime. However, this association disappeared when other variables (younger age; substance use problems) were added to the model. Possibly, homelessness correlated with younger age and/or severity of substance use problems and therefore did not independently contribute to the explanation of violent victimization in patients with dual diagnosis.

Thirdly, perpetration of violent crime was independently associated with younger age, higher scores on the BPRS-E subscale for manic excitement/disorganization, lifetime trauma exposure and more severe alcohol use problems. Although younger age is one of the most robust correlates of criminal offending (Hirschi & Gottfredson, 1983), explanations for this association are varied. (Hirschi & Gottfredson, 1983) state that age has a direct effect on crime, inexplicable by sociological and psychological variables. More recent research however suggests that part of the association could be explained by co-occurring developmental changes, such as social learning (Sweeten, Piquero, & Steinberg, 2013). In consistence with our hypothesis, higher BPRS-E manic excitement/disorganization scores are associated with violent perpetration. This is in line with a review indicating that hostility, impulsivity and higher excitement scores are related to violence in individuals with SMI (Witt et al., 2013) and a study by Peterson et al. (2014) reporting that symptoms of bipolar disorder are more strongly related to

crime perpetration compared to symptoms of depression or schizophrenia spectrum disorders. The association between violent perpetration and lifetime trauma exposure in our sample is in accordance with our hypothesis and has been observed in a broad range of study samples including the general population (McCord, 1983; Widom & Maxfield, 1996), patients with SMI (Witt et al., 2013) and individuals with substance use disorders (Liu, Chui, & Chen, 2018; Torok, Darke, Shand, & Kaye, 2016). The current study is unable to differentiate between trauma during childhood and adulthood or to detect causality. The risk of offending may be increased directly as a result of trauma exposure, or vice versa. Additionally, other factors could have contributed to the risk of both trauma exposure and recent offending. At the bivariate level, violent offending was associated with both severity of alcohol use problems and severity of drug use problems. However, in the multiple regression model, only severity of alcohol use problems was independently associated with violent offending. This finding is in line with a study conducted in the United Kingdom showing that the use of alcohol increases the chance of injuries to others (e.g. violence, traffic accidents) to a larger extent compared to other substances such as cocaine, heroin and cannabis (Nutt, King, & Phillips, 2010). The relationship between alcohol and violence has long been established. The risk of violent offending during intoxication can be increased due to pharmacological properties of alcohol, such as its disinhibiting effects (Goldstein, 1985; Hoaken & Stewart, 2003). In patients with mental illness specifically, alcohol use can interact with existing psychiatric symptoms, increasing the risk of violence (Hiday, 1997; Pickard & Fazel, 2013). A large epidemiologic study in the United States showed that alcohol and cocaine use disorders are more strongly related to intimate partner violence perpetration compared to cannabis and opioid use disorders (Smith, Homish, Leonard, & Cornelius, 2012). Future studies in dual diagnosis populations with a larger sample size than the current study should differentiate between different types of drug use problems.

Fourth, expression of threat is independently associated with more severe alcohol use problems and higher score on the BPRS-E subscale for manic excitement/disorganization. It is likely that the association with alcohol use problems is similar for threat and for violent crime. Besides, it is conceivable that, as for violent perpetration, the relation between higher BPRS-E manic excitement/disorganization scores and threat can be explained by higher scores of hostility, impulsivity and excitement. Furthermore, it is striking that, unlike violent crime perpetration, threat expression is not associated with younger age, since literature suggests that the relationship between younger age and criminal behavior is stable among different crime types (Gottfredson & Hirschi, 1990). However, these studies did not research the relationship between age and expression of threat specifically. Lastly, perpetration of property crime is independently associated with more severe

alcohol and drug use problems. This finding is in accordance with evidence in healthy individuals (Bennett et al., 2008) and pre-trial forensic psychiatric reports (Vinkers, de Beurs, Barendregt, Rinne, & Hoek, 2011). Furthermore, research in female offenders has found that those suffering from alcohol use disorder were more often convicted of violent crime, whilst those with drug use disorder were more often convicted of property crime (Kopak & Smith-Ruiz, 2014). To our best knowledge, no research exists on the association between severity of substance use problems and property crime in patients with a mental illness, and evidence in patients with substance use disorder is limited. Although the direction of the relationship between substance use and property crime perpetration cannot be derived from the current study, it is plausible to be bi-directional. Substance use can lead to property crime in several ways, for example when property crime is committed in order to fund substance use (Goldstein, 1985). In addition, crime could cause substance use through an abnormal environment that provides a culture where substance use is common (White & Gorman, 2000). Furthermore, it is remarkable that in the current study perpetration of property crime is not associated with younger age. This finding is in contrast with extensive research in the general population (Gottfredson & Hirschi, 1990) and with a study among offenders who regularly inject drugs (Sutherland, Sindicich, Barrett, Whittaker, & Peacock, 2015). It could be that our sample of patients with dual diagnosis is less susceptible to social learning, explaining stable criminal rates among all ages (Sweeten et al., 2013).

**Study strengths**

This study has several strengths. It is the first study to assess factors that are associated with perpetration of crime within dual diagnosis patients. Unlike most studies in patients with SMI, the current study distinguishes three types of crime. We used a very comprehensive dataset that did not contain any missing data. The sample consists of participants within a wide range of ages and includes both male and female patients.

**Study limitations**

Our findings should be interpreted with caution, since the current study is limited in several ways. First of all we cannot establish a causal relationship between criminal perpetration and most independent variables, since data were gathered through a cross-sectional survey.

Second, we were unable to adjust for certain important variables in the multiple regression models. Our database does not include data on socioeconomic status, marital status, a history of criminal behavior, type of care in the past 12 months and medication adherence, although evidence suggests associations with criminal perpetration. Additionally, the database lacks a widely used measure for childhood

abuse. Instead we collected data on lifetime trauma exposure, lacking statistics on severity and timing of the event. Moreover, we may not have been able to detect certain more subtle associations due to a lack of power.

Third, the study used a heterogeneous sample in terms of clinical characteristics. We were not able to adjust for particular mental health diagnoses and substance use disorders, since the sample is too small to include the vast number of diagnoses and possible combinations in the multiple regression models. Moreover, since a considerable number of participants have a delayed psychiatric diagnosis due to severe substance use, we did not find the use of separate diagnoses in our analyses appropriate. By using BPRS-E subscale scores, positive and negative symptoms as well as symptomatology of manic and depressive nature in the past month were included in the analyses. In this way, we have attempted to provide insight in the relation between disease specific symptomatology and criminal behavior. Since psychopathology varies over time, a limitation of this approach is that we lack data of BPRS-E subscale scores at the time of a criminal offence. BPRS-E subscale scores report about symptomatology in the past month, whereas self-reported criminal perpetration concerns the past twelve months. Because a relationship between psychopathology and criminal behavior is most likely in close temporal proximity, this might have led to a type II error. Moreover, the internal consistency of the BPRS-E subscales is questionable.

A fourth limitation is the fact that the outcome variables were measured using self-designed yes/no-questions that are not validated in our population. Although reliability and validity of self-reported delinquency are usually acceptable (Thornberry & Krohn, 2000), it is probable that true numbers of criminal perpetration are underestimated in our data, especially when the interviewed individuals have a divergent frame of reference than general population. A combination of self-reported data with criminal justice records would have been a more desirable approach. However, criminal justice records were not available, and so far, no assessments on perpetration have been validated in dual diagnosis patients.

Fifth, only individuals suitable for and willing to participate in group therapy were eligible, since the study used baseline data from a randomized trial with a therapeutic intervention. Also, despite broad inclusion criteria, only individuals currently in treatment could participate. Both aspects may limit the generalizability of our findings.

Lastly, the explained variance in our models indicate a role of other factors in explaining perpetration of violent crime, threat, and property crime by patients with dual diagnosis.

**Future directions and conclusion**

These limitations notwithstanding, the findings of the present study indicate that risk of criminal offending among dual diagnosis patients is a significant problem. There might be particular subgroups within the dual diagnosis population that are at increased risk of criminal behavior, for example patients who suffer from severe alcohol use disorder. This study is a first step in unraveling the complex causal model leading to criminal perpetration in dual diagnosis patients. Further (longitudinal) research is required to identify additional risk factors, such as individual substances of abuse, and establish a causal model leading to criminal perpetration. More insight in the causal pathways leading to criminal perpetration is desirable, since it could support the development of specific prevention programs on reducing involvement in crime by dual diagnosis patients.

# Part II

# The SOS training to prevent victimization in dual diagnosis patients

# Chapter 6

## Self-wise, Other-wise, Streetwise (SOS) training: a novel intervention to reduce victimization in dual diagnosis psychiatric patients with substance use disorders: protocol for a randomized controlled trial

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# Abstract

**Background:** Psychiatric patients are more likely to be victims of crime than others in the community. Dual diagnosis patients with comorbid psychiatric and substance use disorders are especially prone to victimization. Victimization is associated with substance abuse, more severe symptomatology and homelessness. There is a strong need for interventions to reduce victimization in this population. We developed the Self-wise, Other-wise, Streetwise (SOS) training to reduce victimization in patients with dual diagnosis.

**Methods/Design:** This study is a randomized controlled trial using a parallel group design to determine the effectiveness of adding the SOS training to care as usual. Patients with dual diagnosis ($N$ = 250) will be allocated to either care as usual plus SOS training ($n$ = 125) or care as usual only ($n$ = 125) using computer-generated stratified block randomization. To compare effectiveness participants will be interviewed at baseline and 2, 8 and 14 months follow-up. The primary outcome measure is treatment response (yes/no), defined as either no victimization at 14 months follow-up or at least a 50% reduction in incidents of victimization at 14 months follow-up compared to baseline assessment. Victimization is measured with the Safety Monitor, an adequate self-report instrument used by Statistics Netherlands to measure victimization on a large scale in the Netherlands. Outcome assessors are blind to treatment allocation. An economic evaluation will be performed alongside the randomized controlled trial and will take the societal perspective.

**Discussion:** This study is the first randomized controlled trial to examine the effectiveness of an intervention that aims to reduce victimization in patients with dual diagnosis. If the intervention is effective it can be implemented in mental health care and contribute to the safety and well-being of patients.

**Trial registration:** Dutch Trial Register (NTR): 4472, date of registration: 24-03-2014.

# Introduction

In contrast to what the general public assumes, psychiatric patients are more often victims of crime than perpetrators (Choe, Teplin, & Abram, 2008; Latalova, Kamaradova, & Prasko, 2014; Maniglio, 2009b). A systematic review on the prevalence of violent victimization of patients with severe mental illness (SMI) indicates that these patients are more likely to be violently victimized than other community members (Latalova et al., 2014). In addition to violent victimization, psychiatric patients are more often a victim of property crime (Maniglio, 2009b). Recent research in the Netherlands showed an annual prevalence rate of victimization in SMI outpatients of 47% compared to 32% in the general population (Kamperman et al., 2014). Dual diagnosis patients with comorbid psychiatric and substance use disorders are especially prone to victimization (Kessler, 2004; Latalova et al., 2014; Sells et al., 2003). These patients are approximately 1.3– 5.4 times more likely to be violently victimized than psychiatric patients without substance use disorders (Latalova et al., 2014; Sells et al., 2003).

Victimization is associated with physical injury, psychological distress and impaired occupational functioning (Hanson, Sawyer, Begle, & Hubel, 2010; Resnick, Acierno, & Kilpatrick, 1997; Robinson & Keithley, 2000), but also with posttraumatic stress disorder, major depression, substance abuse and difficulties with emotion regulation and assertiveness (Kearns & Calhoun, 2010; Kilpatrick & Acierno, 2003; Krug et al., 2002; Messman-Moore et al., 2013; Resnick et al., 1997; Robinson & Keithley, 2000). In SMI patients, victimization is associated with more severe symptomatology and poorer illness course (Brekke, Prindle, Bae, & Long, 2001; Newman, Turnbull, Berman, Rodrigues, & Serper, 2010; Walsh et al., 2003), more substance abuse (Brekke et al., 2001; Fisher et al., 2015; Goodman et al., 2001; Walsh et al., 2003), depression (Fisher et al., 2015), homelessness (Goodman et al., 2001; Walsh et al., 2003), violent behavior (Hiday, Swanson, Swartz, Borum, & Wagner, 2001), offending (de Vries et al., 2011) and interpersonal problems (Stepp et al., 2012). In substance-dependent patients, victimization is associated with psychological distress (Golder & Logan, 2011), worse psychiatric status, more psychiatric hospitalizations and outpatient treatment, worse general level of functioning (Pirard et al., 2005), worse addiction illness-course (Lijffijt, Hu, & Swann, 2014) and offending (Stevens et al., 2007).

Since most studies used cross-sectional designs, the exact mechanisms behind these associations remain unclear. It is however plausible that these problems associated with victimization, such as substance abuse, more severe symptomatology and homelessness, are consequences as well as predictors of victimization (Brekke et al., 2001; Lam & Rosenheck, 1998; Lijffijt et al., 2014; Messman-Moore et al., 2013; Neria,

Bromet, Carlson, & Naz, 2005; Teasdale, 2009); This may cause a destructive vicious cycle of victimization, substance use and severe symptomatology. In line with this is the finding that an accurate predictor of victimization is having a history of victimization (Classen, Palesh, & Aggarwal, 2005; Lam & Rosenheck, 1998; Roodman & Clum, 2001; Ruback, Clark, & Warner, 2014; Widom, Czaja, & Dutton, 2008). One explanation of this victimization-revictimization link is that some are more prone to become a victim than others, due to personal characteristics, lifestyle and living environment (Tseloni & Pease, 2003; Wittebrood, 2006). There is however evidence that revictimization is partly the result of changes following victimization, like emotion dysregulation, more substance use, offending, depression and posttraumatic stress disorder (Lijffijt et al., 2014; Messman-Moore et al., 2013; Mueser, Rosenberg, Goodman, & Trumbetta, 2002; Ruback et al., 2014).

Victimization of patients is an important concern not only because of its huge effect on mental and physical health, but also because of the significant societal and economic consequences of violence, due to increased burden on social services, healthcare and justice systems and productivity losses (Patel & Taylor, 2012). Reducing victimization in psychiatric patients may have long-lasting effects on personal well-being, the number of criminal offenses in society and economic costs. Consequently, there is a strong need for interventions to reduce victimization in psychiatric patients (de Mooij et al., 2015; Kamperman et al., 2014; Latalova et al., 2014; Maniglio, 2009b; Perese, 2007a; Teplin et al., 2005). Patients with dual diagnosis are the most vulnerable to victimization (Latalova et al., 2014; Maniglio, 2009b; Sells et al., 2003). There is a lack of evidence-based treatment options for patients with substance use disorders co-occurring with severe mental illness (Hunt et al., 2013) or posttraumatic stress disorder (Ralevski, Olivera-Figueroa, & Petrakis, 2014).Therefore, we developed an intervention, the Self-wise, Other-wise, Streetwise (SOS) training, that aims to reduce vulnerability to victimization in patients with dual diagnosis.

SOS training focusses on the modifiable risk factors for victimization, which are subdivided into three different themes, represented in three training modules. The module *Self-wise* targets emotion regulation skills, the module *Other-wise* targets assertiveness and conflict resolution skills and the module *Streetwise* targets knowledge and skills to enhance personal safety and reduce vulnerability. As no evidence-based interventions are available so far, SOS training is based on evidence based treatment programs in other patient groups that target these skills (Bellack, Mueser, Gingerich, & Agresta, 2004; Berking, Ebert, Cuijpers, & Hofmann, 2013; Cloitre et al., 2010; van Wel et al., 2009; Willner et al., 2013). SOS training is adapted to the needs of patients with substance use disorders co-occurring with any other mental disorders and can therefore be widely used in clinical practice.

By adding SOS training to care as usual (CAU) we expect patients to improve on psychopathology, emotion regulation skills, interpersonal problems and self-esteem. Besides, adding SOS training to CAU is expected to result in a decrease in substance use. We expect that these improvements will result in a reduction of victimization.

**Aims of the trial**
This study aims to investigate the effectiveness of SOS training in reducing victimization of patients with dual diagnosis.

The primary research question is:
1. Does adding SOS training to CAU result in a larger reduction of victimization compared to CAU alone?

Secondary research questions are:
2. Does adding SOS training to CAU result in a larger improvement on secondary outcome measures compared to CAU alone?
3. How do costs and effects of SOS training + CAU compare to CAU from a societal perspective?

# Methods/Design

**Design**
This study is a single-blind two-arm randomized controlled trial using a parallel group design to determine the effectiveness of adding SOS training to CAU. Participants will be interviewed at baseline and 2, 8 and 14 months follow-up. After baseline assessment, participants will be randomly allocated to either CAU + SOS training or CAU.

**Participants**
Participants will be recruited in an addiction-psychiatry clinic and an addiction-psychiatry outpatient care facility in Amsterdam. Inclusion criteria are (1) 18 years of age or older; (2) substance dependence or substance abuse (involving alcohol and/or illegal drugs, including cannabis) according to Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV) criteria; and (3) at least one other mental disorder on DSM-IV Axis I or II. Patients are excluded from the study if they (1) do not have sufficient understanding of the Dutch language; or (2) are not eligible for group therapy according to their case manager, due to for instance severe anti-social or psychopathic traits; (3) are not willing to provide informed consent. Based on a priori power analysis, we aim to include 250 (2x125) participants in this study.

**Interventions**

***Self-wise, Other-wise, Streetwise (SOS) training***

The experimental add-on intervention, SOS training, is a 12 session group-based training (de Waal, Goudriaan, Kikkert, & Dekker, 2014). Sessions take place twice a week and take 75 minutes. Each session utilizes learning techniques such as role playing, visual material, group discussions and sharing experiences. The trainers create a safe and respectful environment. Participants can give each other tokens of appreciation during every session, in order to reinforce desirable behaviour. These tokens are cards with coloured stars. By using the tokens, participants learn to reinforce and support each other. Furthermore, the tokens stimulate the participants to listen to and interact with each other. The training comprises 3 modules, *Self-wise, Other-wise* and *Streetwise*. Each module consists of 4 sessions. There is no specific order in which participants follow these modules.

The module *Self-wise* involves a transdiagnostic emotion regulation skills training. Emotion regulation refers to the ability to monitor, evaluate and modify emotional reactions to accomplish one's goals (Thompson, 1994). Emotion dysregulation is a predictor of victimization (Marx et al., 2005; Messman-Moore et al., 2013; Rieffe, Camodeca, Pouw, Lange, & Stockman, 2012; Stevens et al., 2013). Lack of emotional awareness, for instance the inability to recognize and interpret fear cues, impairs risk perception (Messman-Moore et al., 2013; Walsh et al., 2012). Poor risk perception increases the risk for victimization (Marx et al., 2005; Walsh et al., 2012). Emotion dysregulation, especially impulsivity, also increases the likelihood of entering a risky situation and makes it more difficult to leave or adequately cope with a dangerous situation (Messman-Moore et al., 2013; Walsh et al., 2012). Even small increases in emotion regulation can impact victimization risk substantially (Messman-Moore et al., 2013). Since no evidence-based emotion regulation skills training is available for our target group, the content of *Self-wise* is inspired by elements of affect regulation therapy for major depressive disorder (Berking et al., 2013), anger management training for people with intellectual disabilities (Willner et al., 2013), skills training in affect and interpersonal regulation for patients with posttraumatic stress disorder related to childhood abuse (Cloitre et al., 2010) and the system training for emotional predictability and problem solving for patients with borderline personality disorder (van Wel et al., 2009). *Self-wise* is a new, simplified emotion regulation skills training suitable for patients with dual diagnosis, based on the principles of these interventions.

The module *Other-wise* involves a conflict resolution skills training. Offending, violent behaviour, interpersonal problems and lack of assertiveness increase the risk for victimization (de Vries et al., 2011; Hiday et al., 2001; Kearns & Calhoun, 2010; Stepp

et al., 2012; Stevens et al., 2007). Aggressive responses to provocation can easily lead to an escalation of violence. On the other hand, non-assertive responses can provoke manipulation and exploitation. The content of *Other-wise* is inspired by social skills training for patients with schizophrenia (Bellack, Mueser, Gingerich, & Agresta, 2004). In this module patients compose a list of important skills for preventing and resolving conflicts, which are practiced in role-playing exercises categorized by theme. Examples of these themes are: Responding to Frustrating Situations, Handling Bad News and Leaving Unsafe Situations. The specific role-playing exercises within these themes are on input from dual diagnosis patients and mental health professionals working with these patients.

The module *Streetwise* involves a street skills training. It has been suggested that teaching patients about changeable factors that contribute to their risk of victimization may be effective in reducing victimization (Corrigan & Holmes, 1994; Holmes et al., 1997; Perese, 2007b; Teplin et al., 2005). *Streetwise* builds on the suggested strategies that make patients reflect on the safety of their environment and their own contribution to safety. An important aspect of *Streetwise* is safety regarding drug related behaviour and contact with drug dealers. All knowledge and skills are transferred in a playful, stimulating manner, using role-play and creative exercises.

***CAU: Care as usual***

Most participants will suffer from chronic mental health problems. Hence, CAU is an ongoing treatment process. CAU usually consists of pharmacotherapy in combination with a form of case management, for instance assertive community treatment (Stein & Santos, 1998). In addition, since SOS training will be imbedded in addiction-psychiatry treatment programs, when enrolling in this study most participants will attend some form of psychosocial therapy. Depending on the participants' motivation, capacities and needs this may include: cognitive behavioural therapy (Beck, 2011), motivational interviewing (Miller & Rollnick, 2012), substance abuse management training (Roberts, Shaner, & Eckman, 2001), social skills training, psychomotor therapy and mindfulness. The type and amount of care received by participants will be recorded.

***Therapists***

SOS training will be implemented in the treatment programs of an addiction-psychiatry dual diagnosis clinic and an addiction-psychiatry outpatient care facility of Arkin Mental Health Care, division Mentrum. Arkin is an Amsterdam-based public mental health care treatment facility. Eight employees are selected to be trained to deliver the intervention. These SOS-trainers work in various positions, for instance as psychologist, nurse or social worker. All have ample experience in working with psychiatric patients

with substance use disorders and are motivated to implement this new intervention. The SOS-trainers will follow a detailed training manual which describes each training session. Each session will be led by an SOS-trainer accompanied by an SOS-co-trainer.

***Therapist education***

The education for SOS-trainers includes: studying the SOS training manual independently and two 3-hour group training sessions, which will be provided by one of the researchers. The first group training session consists of: the theoretical framework of SOS training, an explanation of the exercises in module Streetwise and practising these exercises. The second group training session consists of: an explanation of the exercises in module Self-wise and Other-wise and practising these exercises. The researcher who provides the education for SOS-trainers will be present at the delivery of the first 12 sessions SOS training on both locations, to provide additional feedback to the SOS-trainers after each session. Thereafter, this researcher will attend an SOS training session at least once every month on both locations. After 6 months, an individual evaluation will be held with every SOS-trainer.

**Procedure**

***Recruitment and consent***

Patients will be recruited in an addiction-psychiatry dual diagnosis clinic and an addiction-psychiatry outpatient care facility. All patients who fit the inclusion criteria, will be informed and invited by their mental health care facility. Participants will receive a participation compensation of 15 Euros per assessment for T0, T1 and T2 and 30 Euros for T3. Written informed consent will be provided before the first assessment takes place.

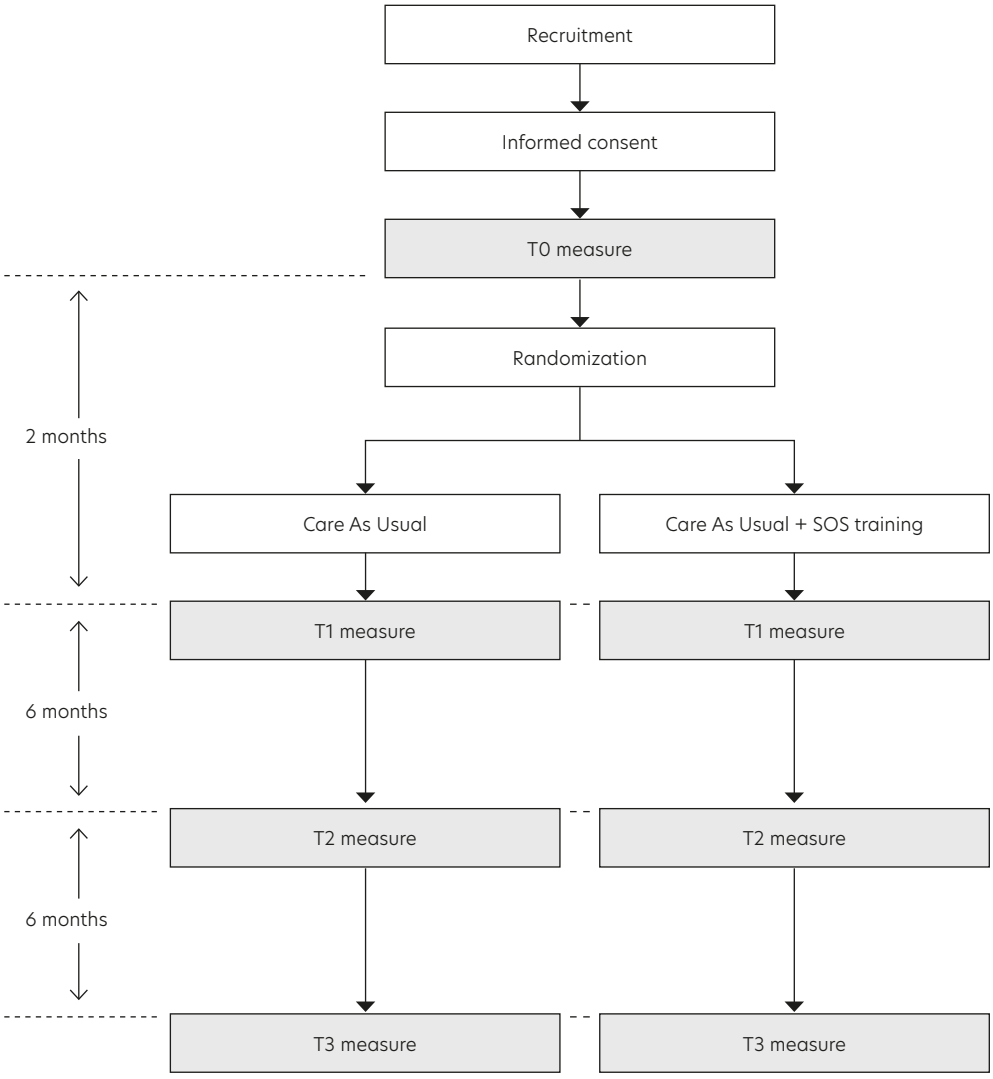
***Randomization and treatment allocation***

Participants will be allocated to CAU + SOS training or CAU by an independent researcher using a computer-generated block randomization schedule. Randomization will be stratified by two prognostic factors: treatment centre (clinic/outpatient care) and victimization in the year prior to baseline (yes/no). Block size varies randomly. To prevent selection bias, the research coordinator and outcome assessors are denied access to the randomization schedule and are blind to block size and order.

***Trial flow***

Figure 1 provides an overview of the trial flow diagram. After informed consent is provided and baseline assessment (T0) has taken place, participants will be randomized and allocated to either CAU + SOS training or continue to receive CAU. Follow-up assessments will take place 2, 8 and 14 months after baseline assessment.

**Figure 1.** Flow chart of the study design.




For participants allocated to trial arm CAU + SOS training this will correspond to immediately, 6 months and 12 months after the completion of SOS training.

**Measurements**

Table 1 provides an overview of the measurement instruments. All instruments will be administered in the form of an interview, by a junior researcher (MSc in Psychology)

or master student (holding a BSc) in clinical psychology. To minimize bias, the junior researcher will train the master student in carefully collecting data and interviewing participants. This training will start with two days consisting of explanation and role plays. After that, the master student will watch the junior researcher administer assessments. Finally, the junior researcher will supervise the first assessments administered by the master student and give feedback.

Both outcome assessors will be blind to the trial arm to which the participant is allocated after randomization. To verify blinding, after each follow-up assessment the assessor will record to which trial arm he/she thinks the participant is allocated. Furthermore, the assessor will record his/her confidence regarding these thoughts on allocation.

***Primary outcome measure: Victimization***

Victimization will be measured with the Dutch version of the Safety Monitor (in Dutch: Veiligheidsmonitor, VM section 4), developed by the Dutch Ministry of Security and Justice (Akkermans et al., 2014). The Safety Monitor is an instrument used by Statistics Netherlands (CBS) to measure victimization on a large scale (almost 80 thousand cases a year). It is an adequate self-report instrument that strongly resembles the International Crime Victimization Survey (ICVS; Killias, 2010). Section 4 of the Safety Monitor assesses victimization of 11 different crimes, subdivided in three categories:

- violent crimes, consisting of: sexual crimes, threats and assaults;
- property crimes, consisting of: burglary, theft from car, car theft, motor vehicle theft, bicycle theft, robbery and theft of other property;
- vandalism.

The Safety Monitor examines whether participants experienced each specific crime in the last 5 years. If so, they are asked whether they experienced that crime in the last 12 months. For each crime reported, participants are asked how frequently they experienced that crime in the last 12 months.

The primary outcome measure is treatment response (yes/no), defined as either no victimization at T3 or at least a 50% reduction in incidents of victimization at T3 compared to T0. Since there are no previous randomized controlled trials available that aimed to reduce victimization in this target group, our treatment response criteria are based on experts opinions. Mental health care professionals working with dual diagnosis patients indicated a 50% reduction in incidents of victimization as a clinically relevant and achievable goal.

**Table 1**

Overview of measurement instruments

| Measurement instrument | T0 | T1 | T2 | T3 |
|---|---|---|---|---|
| Safety Monitor | x | | | x |
| Questions regarding likelihood and controllability of victimization | x | x | x | x |
| Timeline Followback | x | x | x | x |
| Alcohol Use Disorder Identification Test | x | | x | x |
| Drug Use Disorder Identification Test | x | | x | x |
| Brief Psychiatric Rating Scale | x | x | x | x |
| Kessler psychological distress scale | x | x | x | x |
| Difficulties in Emotion Regulation Scale | x | x | x | x |
| Dimensions of Anger Reactions | x | x | x | x |
| Inventory of Interpersonal Problems | x | x | x | x |
| Self Esteem Rating Scale | x | x | x | x |
| EuroQol 5D | x | x | x | x |
| Manchester Short Assessment of Quality of Life | x | x | x | x |
| Trimbos questionnaire on Costs associated with Psychiatric illness | | x | x | x |
| Jellinek PTSD Screening Questionnaire | x | | | x |
| Posttraumatic Diagnostic Scale | x | | | x |
| Mini-Mental State Examination | x | | | |
| Client Satisfaction Questionnaire | | x | x | x |

*Note.* T0 = baseline; T1 = 2-month follow-up; T2 = 8-month follow-up; T3 = 14-month follow-up.

***Key secondary outcome measures***

*Violent victimization and property victimization*

The Safety Monitor subcategories violent victimization and property victimization will be examined separately.

*Substance use (disorders)*

Substance use in the past 90 days will be measured with the Timeline Followback (TLFB; Sobell & Sobell, 1996), which has good reported reliability and validity in dual diagnosis populations (Carey, Carey, Maisto, & Henson, 2004; Stasiewicz et al., 2008). Using calendars, beginning on the day of assessment and working backwards,

participants reconstruct daily substance use.

The Alcohol Use Disorder Identification Test (AUDIT; Saunders et al., 1993), developed by the World Health Organization (WHO) will be included to measure alcohol consumption burden. The AUDIT has shown good reliability and validity in various target groups (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) including individuals with severe mental illness (Babor et al., 2001; Dawe et al., 2000; Maisto et al., 2000). The Drug Use Disorder Identification Test (DUDIT; Berman et al., 2005), developed as a parallel instrument to the AUDIT, will be included to measure drug consumption burden. The DUDIT has shown good reliability and validity in individuals with psychosis (Nesvag et al., 2010) and in substance abusers in various treatment settings (Berman et al., 2005; Voluse et al., 2012).

*Psychopathology*
Psychopathology will be measured with the Brief Psychiatric Rating Scale-Expanded (BPRS-E; Lukoff et al., 1986; Ruggeri et al., 2005), which evaluates a broad range of psychiatric symptoms. The BPRS-E is often used as measure of symptom outcome in psychiatric populations (Burlingame et al., 2005). The clinician-administered instrument is sensitive to change in symptom severity, is valid (Burlingame et al., 2005; Kopelowicz, Ventura, Liberman, & Mintz, 2008) and reliable (Burlingame et al., 2005; Schutzwohl et al., 2003), also in patients with dual diagnosis (Lykke et al., 2008).

*Emotion dysregulation*
Emotion dysregulation will be measured with the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004). The DERS evaluates clinically relevant emotion regulation difficulties across multiple domains, represented in six subscales: non-acceptance of emotional responses, difficulty engaging in goal-directed behaviour, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies and lack of emotional clarity. The DERS is used extensively as outcome variable in clinical research and has high internal consistency and good test-retest reliability and construct validity (Gratz & Roemer, 2004; Neumann et al., 2010), also in patients with SMI (Fowler et al., 2014).

***Other secondary outcome measures***
Other secondary outcome measures are:
- interpersonal functioning as measured with the Inventory of Interpersonal Problems (IIP-32; Horowitz et al., 2000),
- self-esteem as measured with the Self Esteem Rating Scale (SERS-SF 20; Lecomte, Corbiere, & Laisne, 2006),

- anger disposition as measured with the Dimensions of Anger Reactions (DAR; Nederlof, Hovens, Muris, & Novaco, 2009) ,
- psychological distress as measured with the Kessler psychological distress scale (K10; Donker et al., 2010; Kessler & Mroczek, 1994),
- quality of life as measured with the EuroQol 5D (EQ-5D-5L; Herdman et al., 2011) and the Manchester Short Assessment of Quality of Life (MANSA; Priebe, Huxley, Knight, & Evans, 1999),
- healthcare costs and productivity losses/gains as measured with the Trimbos/ iMTA questionnaire on Costs associated with Psychiatric illness (TiC-P; Bouwmans et al., 2013).

***Other variables of interest***

*General patient characteristics*

General demographic characteristics such as age, gender, marital status and educational level will be collected at baseline. Furthermore, current DSM-IV diagnosis, total days of hospitalisation, all-cause mortality, Global Assessment of Functioning (GAF) and mental healthcare received by participants will be extracted from the electronic patient record.

*Context of victimization*

For all crimes reported, context information on victimization will be examined with the Safety Monitor. Each crime reported will be followed by an exploration of the most recent incident. The Safety Monitor contains questions on when and where the incident happened, who the perpetrator was and whether the police was informed. For perpetrator we added the answer options 'friend', 'drug dealer', 'other patient' and 'health care worker' in addition to the existing options.

In addition to the crimes described in the section 'primary outcome measure', four new types of crime that were added in the most recent version of the Safety Monitor will be examined. These new types of crime are: identity fraud, sales fraud, hacking and cyberbullying.

To obtain more detailed information on victimization we extended the Safety Monitor with extra questions. For sexual crimes, threats, assaults and robbery we examine what led to the incident, whether the patient used any substances at the time of the incident and, if relevant, why the participant did not inform the police.

*Likelihood and controllability of victimization*
For each crime assessed with the Safety Monitor, questions are added that examine the perceived likelihood and controllability of becoming a victim of this crime. These questions are based on a risk perception study by Jackson (2011). Participants are asked: 'to what extent do you feel able to control whether or not you become a victim of the following?' and 'how likely do you think it is that you will fall victim of each of the following during the next twelve months?'. To obtain conceptual equivalence, three of the researchers independently translated the questions to Dutch and then formed a panel to resolve discrepancies in these forward translations. Subsequently, an independent translator translated the questions back to English. We discussed discrepancies with this translator until we reached consensus. Finally, we successfully pre-tested the questions on 10 patients from our study population.

*Perpetration*
Perpetration will be measured with the extended version of the Safety Monitor. For each crime, participants are asked if they have committed that crime in the last 5 years. If so, participants are asked if and how often they permitted that crime in the last 12 months. Prior to the assessment of perpetration, participants will be reminded of the confidentiality of the assessment.

*Within-day relationship victimization and substance use*
The within-day relationship between victimization and substance use will be examined with the TLFB (Sobell & Sobell, 1996). First, substance use will be administered with the TLFB, using calendars, as described in the section 'secondary outcome measures'. Thereafter participants will reconstruct victimization in the past 90 days, following the same procedure, beginning on the day of assessment and working backwards. For each day on which both victimization and substance use are reported, the within-day process will be examined. Participants will be asked to indicate whether they used substances before being victimized, after being victimized, or both. The TLFB has previously been used to assess partner violence and victimization and their within-day relation to substance use (Epstein-Ngo et al., 2013; Parks & Fals-Stewart, 2004; Rothman et al., 2012; Stuart et al., 2013).

*Post-traumatic stress disorder*
The Jellinek PTSD Screening Questionnaire (Van Dam, 2013) will be included to screen for post-traumatic stress disorder symptoms. If a participant tests positive, post-traumatic stress disorder symptoms are measured using the Posttraumatic Diagnostic Scale (PDS; Foa, Cashman, Jaycox, & Perry, 1997).

*Cognitive impairment*
The Mini-Mental State Examination (MMSE) will be included to screen for cognitive impairment.

*Client satisfaction with treatment services*
The Client Satisfaction Questionnaire (CSQ-8; Attkisson & Zwick, 1982; de Wilde & Hendriks, 2005) will be included to measure participants' satisfaction with their mental health treatment services.

*Observation scales*
For each participant in the clinic, two observation scales will be independently administered by two out of eight nurses, who are not otherwise involved in the SOS training or research. Social functioning will be measured with the Personal and Social Performance scale (PSP; Morosini, Magliano, Brambilla, Ugolini, & Pioli, 2000). Aggressive and social behaviour will be measured with the Observation Scale for Aggressive Behaviour (OSAB; Hornsveld, Nijman, Hollin, & Kraaimaat, 2007), which consists of the subscales: irritation/anger, anxiety/gloominess, aggressive behaviour, antecedent (to aggressive behaviour), sanction (for aggressive behaviour) and social behaviour. Due to practical reasons, the observation scales will only be administered for hospitalized participants.

*Evaluation of treatment*
After each training session, the SOS-trainers will fill in a session evaluation form in which they note to what extent they followed the instructions in the SOS training manual (scale 1-10) and which participants were present, including a mark (scale 1-10) for effort.

After completing each module of SOS training, participants randomized to CAU + SOS training will fill in a questionnaire to evaluate that module. Each evaluation contains the questions: 'how much fun was this module to you?' and 'how helpful was this module to you?' (both scale 0-10). Subsequently, participants rate three module-specific skills on a scale from 0 to 100, with 0 being 'I did not improve on this at all' and 100 being 'I improved on this a lot'. Finally, participants will rate how much they improved on self-confidence and on controllability of becoming a victim of crime, due to following this module (scale from 0-100).

**Data analysis**
***Sample size calculation***
A priori sample size calculations were performed using G*power 3.1.9.2. We are the first

to explore effects of an intervention to reduce victimization in this target group, which makes it impossible to provide an exact estimate of effect size for the main outcome measure in this sample. In order to be able to detect a 20% difference in treatment response between the two trial arms (50% treatment response in SOS training + CAU versus 30% treatment response in CAU) with $\alpha = .05$ and power = .80, the total sample size should be at least 186 (*N* CAU + SOS training = 93, *N* CAU = 93). Since a drop-out of 25% can be expected in this target group we aim to include 250 participants.

***Effectiveness***

Primary data analyses will be performed in accordance with the intention-to-treat paradigm. In addition, per protocol analyses will be conducted. Missing data will be addressed using multiple imputation. Statistical significance will be set at $\alpha < .05$, based on two-sided tests. The effect of treatment in terms of the primary and secondary outcome variables will be analysed with generalized linear mixed model regression analysis (GLMM) with adequate link functions, taking into account distributional characteristics of the data.

***Costs***

We will consider four types of costs: (1) the costs of offering the intervention (SOS training + CAU or CAU), (2) costs stemming from general health care uptake besides SOS training + CAU or CAU, including the costs of medication, (3) patients' out-of-pocket expenses (e.g. traveling costs, leisure time spent on receiving care), (4) costs stemming from productivity losses due to absenteeism or reduced efficiency while at work (presenteeism). The first two types of costs are also known as the direct medical costs and these will be based on the full economic costs of offering the interventions. Here, we will use the pertinent Dutch guideline for economic evaluation (Hakkaart-van, Tan, & Bouwmans, 2010), and rely on the standard cost prices reported therein. Productivity losses will be based on the gender- and age-specific labour costs. Data on resource use (health care uptake) and productivity losses will be collected with the widely used TiC-P (Bouwmans et al., 2013).

***Effects***

As effect measure, the 5-level variant of the 5-dimensional EuroQol instrument (EQ-5D-5L; Herdman et al., 2011) will be used to compute health gains expressed in quality adjusted life years (QALYs). Health utilities are a major feature of the EQ-5D instrument. As the EQ-5D-5L is relatively recent update of the 3-level EQ-5D, studies that directly elicit preferences from general population samples to derive value sets to calculate the EQ-5D-5L health utilities are under development in a number of countries, including the Netherlands (EuroQol Group, 2015). In the interim, the EuroQol Group coordinated

a study that administered both the 3-level and 5-level versions of the EQ-5D, in order to develop a "crosswalk" between the EQ-5D-3L value sets and the new EQ-5D-5L descriptive system, resulting in crosswalk value sets for the EQ-5D-5L (van Hout et al., 2012). It is expected that the new utilities for the EQ-5D-5L will be available when we will perform the calculations for the economic evaluation; otherwise we will use the crosswalk from the EuroQol Group to calculate health utilities.

***Cost-effectiveness calculations***

The economic evaluation will be conducted alongside the randomized trial, taking into account the CHEERS statement (Husereau et al., 2013) and the 2015 ISPOR good research practices task force report on cost-effectiveness analysis alongside clinical trials (Ramsey et al., 2015). Technically, the economic evaluation referred to as cost-effectiveness analysis in the following section will be a cost-utility analysis as health utilities are used as the effect measure.

Using the area under the curve (AUC) method, the periods between the measurement waves will be weighted by the utility of the health state in that period. This allows the computation of quality adjusted life years (QALYs) over the entire trial period. In similar vein, cumulative costs over the entire follow-up period will be obtained from the cost estimates at the various measurement waves. The cost-utility evaluation will be performed in line with suggestions by Drummond, Sculpher, Torrance, O'Brien, and Stoddart, (2005), i.e. in agreement with the intention-to-treat principle, with missing data addressed using imputation.

The incremental cost-effectiveness ratio (ICER) will be calculated as follows: ICER = (C1-C2)/(E1-E2), where C stands for costs, E for effects, and subscripts 1 and 2 refer to the two trial arms (SOS training + CAU and CAU, respectively). Confidence intervals around the ICER will be calculated using a non-parametric bootstrap approach: 5,000 non-parametric bootstrapped samples will be extracted from the original dataset. For each of these bootstrapped samples, the incremental costs, incremental effects, and the incremental cost-effectiveness ratio (ICER) will be calculated. The resulting 5,000 ICERs will be used for further calculations and will be plotted on a cost-effectiveness plane. In addition, cost-effectiveness acceptability curves (CEACs) will be constructed. One-way sensitivity analyses directed at uncertainty in the main cost drivers will be performed to gauge the robustness of our findings. In addition, a sensitivity analysis in which a covariate-adjusted CEAC curve is constructed will be conducted using net benefit regression methods (Hoch, Rockx, & Krahn, 2006; Isaranuwatchai, Markle-Reid, & Hoch, 2015).

**Ethical approval**
This RCT has been reviewed and approved by the ethics committee of the Academic Medical Center of the University of Amsterdam, Amsterdam, The Netherlands and will be conducted in accordance with the Declaration of Helsinki (World Medical Association, 2014).

# Discussion

Patients with comorbid mental and substance use disorders are vulnerable to victimization (Choe et al., 2008; Kamperman et al., 2014; Latalova et al., 2014; Maniglio, 2009b; Sells et al., 2003). There is a strong need for interventions that reduce victimization of patients (Kamperman et al., 2014; Latalova et al., 2014; Maniglio, 2009b; Perese, 2007b; Teplin et al., 2005). This randomized clinical trial is the first to test the effectiveness of an intervention that aims to reduce vulnerability for victimization in patients with dual diagnosis. We will test whether adding the Self-wise, Other-wise, Streetwise (SOS) training to care as usual results in a reduction of victimization. Besides, we will examine improvement on secondary outcome measures and cost-effectiveness.

Previous studies testing the effectiveness of psychosocial interventions in similar target groups have been hampered by small samples, poor experimental design, short follow-up periods and high loss to treatment and loss to follow-up (Hunt et al., 2013). Major strengths of this study are the follow-up period of 14 months, the relatively large sample size of 250 individuals and the large battery of validated and clinically relevant outcome measures. Furthermore, those assessing outcomes will be blind to treatment allocation. Our main challenges in this study are expected to be treatment adherence and preventing drop-out. We will work closely together with patients' mental health care professionals to prevent drop-out as much as possible. Moreover, participants will receive monetary compensation for completing follow-up assessments. Finally, missing data will be addressed using multiple imputation.

If SOS training is effective in reducing vulnerability for victimization it can be implemented in mental health care and contribute to the safety and well-being of patients.

# Chapter 7

## Self-wise, Other-wise, Streetwise (SOS) training: an intervention to prevent victimization in dual diagnosis patients: results from a randomized clinical trial

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# Abstract

**Background and Aims:** Patients with co-occurring substance use and other mental disorders are vulnerable to crime victimization, yet no evidence based preventive interventions exist. Our aim was to test the efficacy of a new intervention, Self-wise, Other-wise, Streetwise training (SOS training), to prevent victimization in these dual-diagnosis patients as an add-on to care as usual.

**Design:** Multi-site single-blind parallel randomized controlled trial.

**Setting:** Three sites within one psychiatric service in Amsterdam, the Netherlands.

**Participants:** Adult in-patients and out-patients with dual diagnosis ($N$ = 250), who were predominantly male (70.4%), aged on average 42.1 years, and diagnosed with 3.7 DSM-IV disorders.

**Intervention and comparator:** Care as usual, consisting of pharmacotherapy combined with individual psychotherapy, group psychotherapy and/or supportive counselling ($n$ = 125) was compared with care as usual plus SOS training: a 6-week, 12-session manualized group training focused on enhancing emotion regulation skills, conflict resolution skills and street skills ($n$ = 125).

**Measurements:** Victimization was assessed with the Safety Monitor, the Dutch equivalent of the International Crime Victims Survey, in a face-to-face assessment. The primary outcome measure was treatment response (yes/no), with 'yes' defined as reporting at least a 50% reduction in the number of past-year victimization incidents at the 14-month follow-up compared with baseline. Analyses were performed according to the intention-to-treat principle.

**Results:** The proportion of participants achieving treatment response for total victimization was 54.0% in the control group and 67.6% in the experimental group, a significant difference [odds ratio (OR) = 1.78, 95% confidence interval (CI) = 1.02-3.11, $p$ = .042]. Treatment response for violent victimization was achieved by 68.7% of the control group and 79.3% of the experimental group (OR = 1.75, 95% CI = 0.91-3.34, $p$ = .092). With a Bayes factor of 2.26, this result was inconclusive.

**Conclusions:** Among dual-diagnosis patients, care as usual plus Self-wise, Other-wise, Streetwise training was more effective in preventing victimization than care as usual alone.

# Introduction

Patients with substance use disorders are at elevated risk of becoming victims of crime, which is associated with psychiatric distress, more drug use, homelessness, offending and worse treatment outcomes (Neale et al., 2005; Pirard et al., 2005; Stevens et al., 2007; Walton et al., 2002). Victimization is also prevalent among patients with other mental disorders (Maniglio, 2009b; Vaughn et al., 2010). In the United States, 39.1% of adults with a past-year substance use disorder also met criteria for another mental disorder (SAMHSA, 2015). These patients with co-occurring substance use and other mental disorders (dual-diagnosis patients) are even more vulnerable to victimization (de Waal, Dekker, & Goudriaan, 2017; Sells et al., 2003). A recent study in the Netherlands showed that dual-diagnosis patients have a highly increased risk to experience physical or sexual assault compared to the general population [relative risk (RR) = 14.8 and RR = 5.8, respectively] (de Waal, Dekker, & Goudriaan, 2017).

Although several evidence-based victimization prevention strategies exist, these mainly target domestic violence or (sexual) violence in schools (DeGue et al., 2014; Whitaker, Murphy, Eckhardt, Hodges, & Cowart, 2013). There are no evidence-based interventions available to reduce the vulnerability to victimization of patients with substance use and/or other mental disorders. Self-wise, Other-wise, Streetwise (SOS) training is a novel intervention specifically designed to prevent victimization in the high risk group of dual-diagnosis patients.

The most widely used criminological approach to explain differences in vulnerability to crime victimization is the routine activity theory (Cohen & Felson, 1979), stating that crimes are likely to occur when three elements are present: a motivated offender, an attractive target and the absence of capable guardianship. As victimization experiences of dual-diagnosis patients encompass a wide variety of perpetrators (e.g. strangers, partners, acquaintances) and locations (e.g. at home, in public, in care facility) (de Waal, Dekker, Kikkert, et al., 2017), the SOS training aims to reduce the 'attractiveness as a target' of a heterogeneous group of patients by targeting potential common underlying vulnerabilities, via improving emotion regulation skills, conflict resolution skills and street skills (de Waal et al., 2015).

In addition to their high risk for victimization, dual-diagnosis patients experience more severe symptoms, increased relapse rates and worse clinical outcomes (Hunt et al., 2013; Kavanagh et al., 2003; Kessler, 2004). If patients' risk for victimization could be reduced, this may impact mental health and substance use problems as an indirect effect of the intervention.

This study aimed to (1) test the efficacy of the SOS training as an add-on to care as usual (CAU) in preventing total, violent, and property victimization in dual-diagnosis patients; (2) tests its efficacy in reducing substance use problems and psychiatric symptom severity; (3) explore predictors of outcome. We hypothesized that CAU + SOS training would be more effective in preventing total, violent and property victimization and in reducing substance use problems and psychiatric symptom severity compared to CAU. To enhance clinical relevance, the pragmatic trial was designed to closely reflect clinical practice (Tunis, Stryer, & Clancy, 2003). A representative sample was acquired by applying a minimal set of exclusion criteria, and CAU was not interfered with. Trained therapists were employees with diverse educational backgrounds and duration of working experience.

# Methods

**Design**

This study is a single-blind randomized controlled trial using a parallel group design to determine the efficacy of adding SOS training to CAU. Participants were assessed at baseline and at 2, 8 and 14 months' follow-up. After baseline assessment, participants were randomly allocated to CAU or CAU + SOS training. Full study details are published in the study protocol (de Waal et al., 2015). The study has been reviewed and approved by the ethics committee of the Academic Medical Centre of the University of Amsterdam, Amsterdam, the Netherlands and was registered at trialregister.nl (NTR4472). The trial was powered to detect a 20% difference in the primary outcome: treatment response for total victimization. With an estimated 30% treatment response in CAU and 50% treatment response in CAU + SOS training, a power of 0.80, an a level of .05 and estimated drop-out of 25%, we needed 250 participants.

**Participants**

Participants were in-patients and out-patients recruited at one of three sites from a psychiatric service in Amsterdam, the Netherlands (Arkin Mental Health Care, division Mentrum), where patients are treated for both substance use disorders and other mental disorders. Inclusion criteria were: (1) 18 years of age or older; (2) substance use dependence or substance abuse (alcohol and/or drugs) according to the *Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision* (DSM-IV-TR; American Psychiatric Association, 2000); and (3) at least one other DSM-IV Axis I or Axis II disorder.

Exclusion criteria were: (1) insufficient understanding of the Dutch language; (2) not eligible for group therapy based on the clinical judgement of the mental health-care

provider due to, for instance, severe acute psychotic symptoms or severe antisocial or psychopathic traits that could disturb the group training.

**Procedure**

Recruitment took place from April 2014 through April 2016, with follow-up to July 2017. Inclusion and exclusion criteria were checked for all patients by their mental health-care provider, using the current DSM-IV diagnoses as determined by a psychiatrist, from the electronic patient file. It was not feasible to conduct an inclusion interview; this would have been too burdensome, as it should have included the full spectrum of DSM-IV Axis I and Axis II disorders. If a patient was indicated to be ineligible for group therapy, their mental health-care provider was asked to specify the reason. All patients who fulfilled the criteria were informed about the study and invited to participate. Participants provided written informed consent and completed a 90-minute face-to-face baseline assessment (T0), conducted at the treatment facility.

After T0, participants were randomly allocated to CAU + SOS training or CAU. Randomization was performed by an independent researcher using a computer-generated block randomization schedule. Randomization was stratified by two prognostic factors: treatment site and any victimization in the year prior to baseline (yes/no). Block size varied randomly. To prevent bias, the research coordinator and outcome assessors were denied access to the randomization schedule and were blind to block size and order. The research coordinator informed participants and therapists about the treatment allocation.

All follow-up assessments consisted of face-to-face interviews of approximately 75-90 minutes and took place 2 (T1), 8 (T2) and 14 months (T3) after baseline. For participants allocated to CAU + SOS training this corresponded to immediately, 6 months and 12 months after completion of the SOS training. All participants received a financial compensation of €15 for the first three assessments and €30 for T3.

**Measures**

Assessors were blind to treatment allocation. Assessors explained the importance of blinding to participants after the baseline measurement and reminded participants of this at the beginning of each follow-up measure. In case of unblinding during an intermittent measurement, another assessor would administer the next measurement(s). At T3, 42 incidents of unblinding occurred (35 in CAU + SOS training and seven in CAU).

The primary outcome measure was treatment response (yes/no), with 'yes' defined as either reporting no past-year victimization incidents at T3 or reporting at least a 50%

reduction in the number of past-year victimization incidents at T3 compared to the year prior to T0. As described in the study protocol (de Waal et al., 2015), the treatment response criterion was based on expert opinion, as there were no comparable randomized controlled trials available. Mental health-care professionals working with dual-diagnosis patients indicated a 50% reduction of victimization incidents as a clinically relevant and achievable goal. Victimization in the past 12 months was assessed at T0 and T3 with the Safety Monitor, developed by the Dutch Ministry of Security and Justice (Akkermans et al., 2014). The Safety Monitor is a victimization survey that is the Dutch equivalent of the International Crime Victims Survey (ICVS; Killias, 2010). The Safety Monitor is used by Statistics Netherlands to measure victimization on a large scale and has previously been used to study victimization in patients with severe mental illness (de Mooij et al., 2015; Kamperman et al., 2014). As yet, there are no psychometric properties available. With the Safety Monitor, victimization was assessed in terms of 11 different crimes, subdivided into three categories: (1) violent crimes, consisting of sexual assault, threats and physical abuse; (2) property crimes, consisting of burglary, car theft, theft from car, other motor vehicle theft, bicycle theft, robbery and theft of other property; and (3) vandalism. Sexual assault is defined as being touched or grabbed, with sexual intentions, in an offensive way. Threats is defined as being threatened with being hit, being kicked, a pistol, a knife or something similar, without being physically attacked or physically abused. Physical abuse is defined as being physically attacked or physically abused. Vandalism is defined as intentional damage to or destruction of personal property. For each type of crime, participants reported whether they had been a victim of that particular type of crime in the last 12 months and, if so, how frequently. The total number of victimization incidents reported at T0 and T3 was calculated and used to determine the dichotomous primary outcome measure treatment response (yes/no). Treatment response regarding the subcategories violent victimization and property victimization was calculated in the same manner and evaluated separately.

Secondary outcome measures were alcohol use problems, drug use problems and psychiatric symptom severity. Severity of alcohol use problems in the past year was measured with the Alcohol Use Disorder Identification Test (AUDIT; Saunders et al., 1993), which has also shown good reliability and validity in people with severe mental illness (Dawe et al., 2000; Maisto et al., 2000). Severity of drug use problems in the past year was measured with the Drug Use Disorder Identification Test (DUDIT; Berman et al., 2005), which has shown good reliability and validity in the substance abuse population in various treatment settings (Berman et al., 2005; Voluse et al., 2012). Psychiatric symptom severity in the past month was measured with the Brief Psychiatric Rating Scale-Expanded (BPRS-E; Lukoff et al., 1986), a frequently used outcome measures in psychiatric populations that has shown to be reliable and

valid (Burlingame et al., 2005), also in dual-diagnosis populations (Lykke et al., 2008). The AUDIT and DUDIT were administered at T0, T2 and T3, and the BPRS-E was administered at each time-point. Cost-effectiveness of the intervention and other secondary outcome measures described in the study protocol (de Waal et al., 2015) will be addressed in a subsequent paper. Demographic characteristics age, sex, country of birth, education level, employment status and living condition were collected at T0. Baseline DSM-IV diagnoses and type and amount of CAU received were extracted from the electronic patient record. Participants allocated to CAU + SOS training were asked to rate the degree of pleasure and the degree of helpfulness of each training module on a scale of 0-10 via an anonymous evaluation form directly after the last session of each module.

**Treatment**

The SOS training is a manualized group training (de Waal et al., 2015) for dual-diagnosis patients, specifically designed for the purpose of the current study. Eight in-patients and six out-patients with dual diagnosis were involved in the development of the treatment program via participation in a pilot phase. The SOS training was delivered in 12 twice-weekly 90-minute sessions (including a 15-minute break) within a 6-week time-frame. Sessions were delivered by any two of 14 trained therapists, with a maximum of eight participants per session. The program is designed to be enjoyable, practical and comprehensible and sessions generally consist of a combination of group discussions, role-plays and interactive, lively, sometimes game-like exercises. The SOS training comprises 3 modules, Self-wise, Other-wise and Streetwise, each of which consists of four sessions. The treatment groups are semi-closed: at the first session of each module, new participants can join the group and start with the training. Hence, the order in which participants follow the modules varies. As the group composition slightly changes after each four sessions, each module starts with becoming acquainted with new group members. The module 'Self-wise' involves a newly developed emotion regulation skills training, inspired by the principles of existing emotion regulation skills trainings (Berking et al., 2013; van Wel et al., 2009). The module 'Self-wise' comprises various interactive group exercises to practice with recognizing one's own emotions, interpreting emotional expressions of others and coping with feelings of anxiety and feelings of anger, using specifically designed visual materials such as emoticons. The module 'Other-wise' involves a newly developed conflict resolution skills training inspired by social skills training for patients with schizophrenia (Bellack, Mueser, Gingerich, & Agresta, 2004), but specifically focusing on preventing and resolving interpersonal conflicts. In this module, participants jointly compose a list of important conflict resolution skills, which are subsequently practiced in role-playing exercises categorized by relevant themes. The specific role-playing exercises are based on

input from dual-diagnosis patients who participated in the pilot phase to ensure the exercises are relevant to the population and applicable to real-life situations of dual-diagnosis patients. The module 'Streetwise' involves a newly developed street skills training, which builds on the idea that teaching patients about behavioural factors that contribute to their risk of victimization may be effective in reducing victimization (Corrigan & Holmes, 1994; Holmes et al., 1997; Perese, 2007a; Teplin et al., 2005). 'Streetwise' comprises various interactive group exercises and group discussions that aim to make participants reflect on the safety of their activities and environment and their own contribution to safety.

Therapists were six psychologists with a master's level university degree and eight nurses with intermediate or higher vocational education. All therapists received training to deliver the SOS training, which included studying the treatment manual and participating in two 4-hour training sessions (provided by M.d.W.). The first 12 sessions of SOS training per location were supervised (by M.d.W.). Thereafter, supervision was provided at least once a month at each location. Additional supervision by telephone or e-mail was provided on request. In order to increase treatment fidelity, therapists were asked to rate how well they adhered to the treatment protocol on a scale of 0-10 after each session, which resulted in an average of 9.2 [standard deviation (SD) = 1.0].

All participants received CAU, generally consisting of pharmacotherapy combined with individual and/or group psychotherapy and/or supportive counselling, provided by psychologists, case-workers, nurses and/or psychiatrists. The type and amount of mental health-care contacts provided to participants at Arkin mental health care were extracted from the electronic patient file.

**Statistical analysis**

Analyses were performed according to the intention-to-treat principle. All statistical analyses were performed using R version 3.4.4. All reported *p*-values are two-tailed and $p < .05$ was chosen as the threshold for statistical significance.

The primary outcome treatment response (yes/no), and the subcategories treatment response for violent victimization (yes/no) and treatment response for property victimization (yes/no) were analysed using three separate logistic regression analyses with group allocation as independent variable. There was no evidence of treatment effect heterogeneity across sites. Unblinding was not associated with treatment response. Bayes factors were calculated for non-significant findings (Beard, Dienes, Muirhead, & West, 2016). Three additional models were fitted adjusted for predictors of treatment response for total victimization, violent victimization, and property

victimization. Predictors of treatment response were determined by testing whether baseline characteristics [age, gender, country of birth (the Netherlands/other), education level (lower/middle or high), employment status (unemployed/paid or volunteer), homelessness (yes/no), type of care at baseline (in-patient/out-patient), past-year victimization (yes/no), alcohol use disorder (yes/no), cannabis use disorder (yes/no), cocaine use disorder (yes/no), opioid use disorder (yes/no), psychotic disorder (yes/no), mood disorder (yes/no), post-traumatic stress disorder (PTSD) (yes/no), personality disorder (yes/no), total number of DSM-IV disorders] significantly predicted treatment response for total, violent and property victimization in three separate logistic regression analyses with a backward elimination procedure, with group allocation held in the model. Missing data on victimization at T3 were assumed to be missing-at-random and were imputed using multiple imputation by chained equations. We created 50 multiple imputed datasets with 100 iterations, using the R package mice version 2.46.0 (van Buuren, 2011). Missingness was related to younger age and homelessness. There were no other significant differences in baseline characteristics between responders and non-responders at T3. Predictor variables for the imputation model were selected because they were related to missingness or to the imputed variables. As a robustness check, we also performed complete case analyses by repeating the logistic regression analyses only in participants with complete T3 data.

The continuous secondary outcome measures were analysed with linear mixed models with a two-level structure (repeated measures, patients) in R package lme4 version 1.1-17 (Bates, Maechler, Bolker, & Walker, 2015). First, the overall intervention effect was evaluated with group allocation as a fixed effect and the baseline value of the particular outcome variable as covariate. Subsequently, we evaluated between-group differences at the separate follow-up time-points by adding time (as a categorical variable represented by dummy variables) and an interaction between group and time to the model. As we used mixed-model analyses for evaluating secondary outcome measures, no imputation of missing data was needed (Twisk, de Boer, de Vente, & Heymans, 2013).

A table will be presented showing baseline characteristics for each group. For continuous variables with an asymmetrical distribution, the median and interquartile range will be presented.

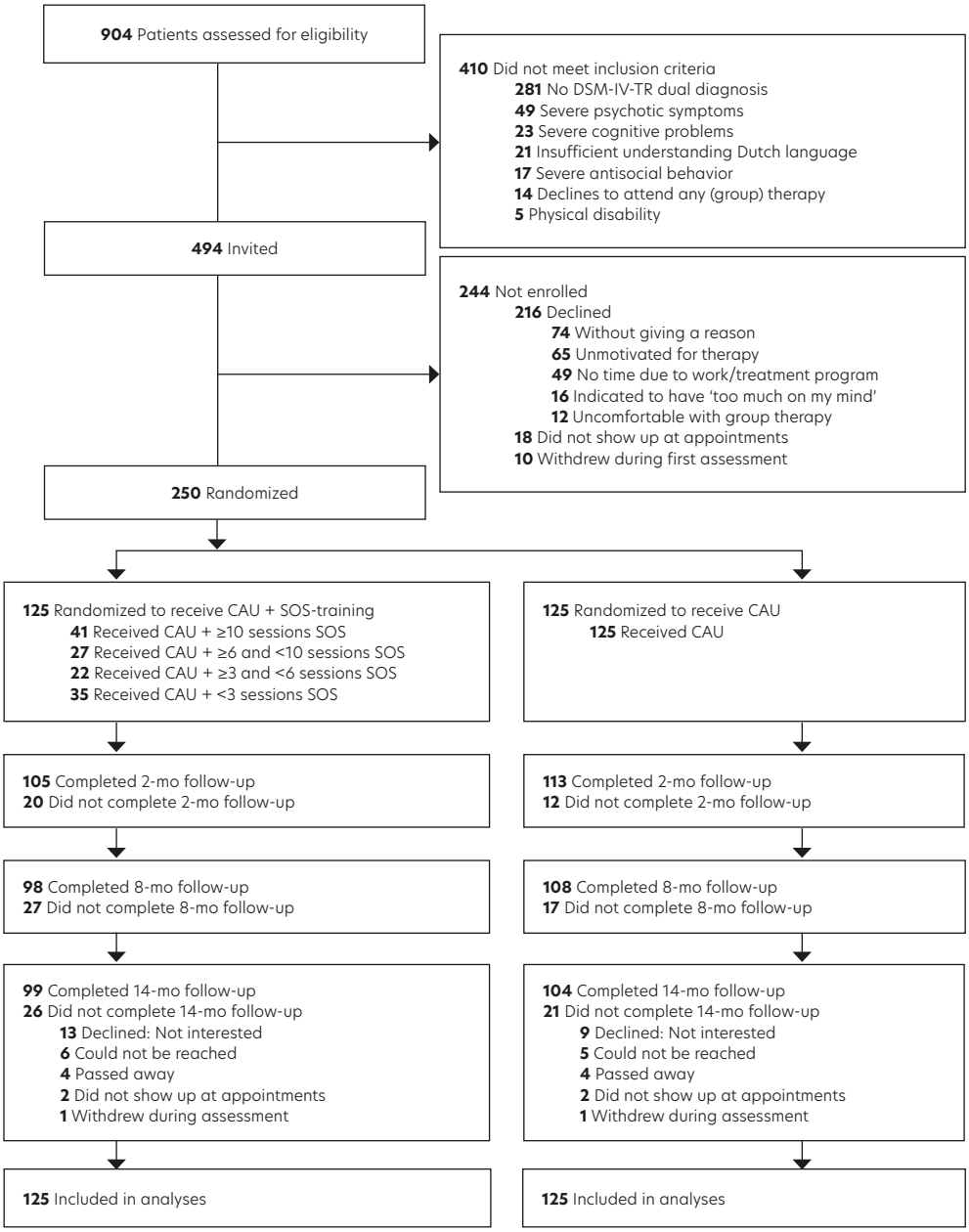
# Results

**Participants**

Figure 1 shows the participant flow throughout the study. In total, 250 patients were included and randomized. Of these 250 participants, seven were indicated by their mental health provider as dual-diagnosis patients, but only had a formal diagnosis of either substance use disorder (*n* = 5) or psychotic disorder (*n* = 2) at the time of inclusion. As these patients were already randomized when this was detected (CAU + SOS training *n* = 3; CAU *n* = 4), they were included in follow-up assessments and analyses.

Baseline demographic and clinical characteristics (Table 1) and type and dosage of CAU received at Arkin mental health care (Table 2) were well balanced between the two randomized groups. On average, participants in the CAU + SOS training group received 6.2 (*SD* = 4.2) sessions of SOS training, with 41 participants (32.8%) receiving 10-12 sessions, and 35 participants (28.0%) receiving fewer than three sessions of SOS training. Frequently indicated reasons for being absent from the SOS training were: being discharged from the in-patient clinic and being unmotivated or practically unable to continue SOS training as out-patient, not feeling well physically and/or mentally, having overslept, being transferred to a hospital or (another) mental health ward and a lack of time due to health- or work-related appointments. All randomized participants were included in the analyses regardless of treatment adherence. Participants allocated to CAU + SOS training rated the module Other-wise as most pleasurable (grade 8.4) and most educational (grade 8.4), followed by Self-wise (pleasure grade 8.1; educational grade 8.0) and Streetwise (pleasure grade 7.8; educational grade 7.6).

**Figure 1.** Flow of participants through the study.




*Note.* CAU = care as usual; DSM-IV = Diagnostic and Statistical Manual of Mental disorders, 4th edition; SOS = Self-wise, Other-wise, Streetwise training.

**Table 1**

Baseline demographic and clinical characteristics

| Characteristic | CAU + SOS (*n* = 125) | CAU (*n* = 125) | Total sample (*N* = 250) |
|---|---|---|---|
| Age, years, mean (SD) | 42.4 (11.2) | 41.8 (10.7) | 42.1 (11.0) |
| Sex, *n* (%) | | | |
| Men | 87 (69.6) | 89 (71.2) | 176 (70.4) |
| Women | 38 (30.4) | 36 (28.8) | 74 (29.6) |
| Country of birth, *n* (%) | | | |
| The Netherlands | 88 (70.4) | 95 (76.0) | 183 (73.2) |
| Europe, other than NL | 6 (4.8) | 9 (7.2) | 15 (6.0) |
| Suriname | 10 (8.0) | 6 (4.8) | 16 (6.4) |
| Morocco | 8 (6.4) | 3 (2.4) | 11 (4.4) |
| Netherlands Antilles | 4 (3.2) | 2 (1.6) | 6 (2.4) |
| Other | 9 (7.2) | 10 (8.0) | 19 (7.6) |
| Education level[a], *n* (%) | | | |
| Lower | 75 (60.0) | 66 (52.8) | 141 (56.4) |
| Middle | 35 (28.9) | 44 (35.2) | 79 (31.6) |
| High | 15 (12.0) | 15 (12.0) | 30 (12.0) |
| Employment status, *n* (%) | | | |
| Paid employment | 3 (2.4) | 15 (12.0) | 18 (7.2) |
| Volunteer work | 39 (31.2) | 37 (29.6) | 76 (30.4) |
| Unemployed | 83 (66.4) | 73 (58.4) | 156 (62.4) |
| Living condition, *n* (%) | | | |
| With others | 20 (16.0) | 24 (19.2) | 44 (17.6) |
| Alone | 51 (40.8) | 53 (42.4) | 104 (41.6) |
| Sheltered housing | 22 (17.6) | 22 (17.6) | 44 (17.6) |
| Homeless | 32 (25.6) | 26 (20.8) | 58 (23.2) |

*table continues*

| | | | |
|---|---|---|---|
| Type of care at baseline, *n* (%) | | | |
| Inpatient care | 85 (68.0) | 83 (66.4) | 168 (67.2) |
| Outpatient care | 40 (32.0) | 42 (33.6) | 82 (32.8) |
| Substance use disorder, *n* (%) | | | |
| Alcohol | 77 (61.6) | 80 (64.0) | 157 (62.8) |
| Cannabis | 65 (52.0) | 50 (40.0) | 115 (46.0) |
| Cocaine | 57 (45.6) | 53 (42.4) | 110 (44.0) |
| Opioid | 33 (26.4) | 25 (20.0) | 58 (23.2) |
| Sedatives | 21 (16.8) | 28 (22.4) | 49 (19.6) |
| Amphetamines | 15 (12.0) | 13 (10.4) | 28 (11.2) |
| Other substances | 4 (3.2) | 8 (6.4) | 12 (4.8) |
| Mental health disorder, other than SUD, *n* (%) | | | |
| Psychotic disorder | 53 (42.4) | 42 (33.6) | 95 (38.0) |
| Mood disorder | 26 (20.8) | 28 (22.4) | 54 (21.6) |
| Posttraumatic stress disorder | 16 (12.8) | 17 (13.6) | 33 (13.2) |
| Anxiety disorder, other than PTSD | 9 (7.2) | 11 (8.8) | 20 (8.0) |
| Attention-deficit/hyperactivity disorder | 7 (5.6) | 13 (10.4) | 20 (8.0) |
| Personality disorder | 46 (36.8) | 44 (35.2) | 90 (36.0) |
| Intellectual disability | 13 (10.4) | 18 (14.4) | 31 (12.4) |
| Other disorder | 15 (12.0) | 13 (10.4) | 28 (11.2) |
| Total number of DSM-IV disorders, *n* (%) | 3.7 (1.4) | 3.6 (1.4) | 3.7 (1.4) |
| At least one victimization incident in 12-mo prior to baseline, *n* (%) | 97 (77.6) | 95 (76.0) | 192 (76.8) |
| Total number of incidents of victimization, median (IQR) | 3 (1-9) | 3 (1-8) | 3 (1-9) |
| Number of incidents of violent victimization, median (IQR) | 1 (0-4) | 1 (0-4) | 1 (0-4) |
| Number of incidents of property victimization, median (IQR) | 1 (0-2) | 1 (0-3) | 1 (0-3) |
| AUDIT score, mean (SD) | 15.1 (12.8) | 15.0 (12.8) | 15.0 (12.8) |
| DUDIT score, mean (SD) | 19.0 (12.8) | 17.4 (13.6) | 18.2 (13.2) |
| BPRS-E score, mean (SD) | 38.9 (8.8) | 37.6 (8.3) | 38.2 (8.5) |

*Note.* AUDIT = Alcohol Use Disorder Identification Test; BPRS-E = Brief Psychiatric Rating Scale - Expanded; CAU = care as usual; DUDIT = Drug Use Disorder Identification Test; IQR = interquartile range; PTSD = posttraumatic stress disorder; SD = standard deviation; SOS = Self-wise, Other-wise, Streetwise training; SUD = substance use disorder.
[a] Lower indicates primary education or lower general secondary education; middle indicates intermediate vocational education of higher high school level; and high indicates higher vocational education or university.

**Table 2**

Care as usual received at Arkin mental health care between baseline and 14-mo follow-up

| | CAU + SOS (*n* = 125) | CAU (*n* = 125) | Total sample (*N* = 250) |
|---|---|---|---|
| Days of clinical care, *n* (%) | | | |
| None | 34 (27.2) | 32 (25.6) | 66 (26.4) |
| 1 to 30 days | 22 (17.6) | 26 (20.8) | 48 (19.2) |
| 31 to 60 days | 21 (16.8) | 20 (16.0) | 41 (16.4) |
| 61 to 120 days | 25 (20.0) | 22 (17.6) | 47 (18.8) |
| 121 to 427 days | 23 (18.4) | 25 (20.0) | 48 (19.2) |
| Number of sessions, median (IQR) | | | |
| Pharmacotherapy | 5 (1-15) | 5 (2-13) | 5 (1-13) |
| Individual psychotherapy | 39 (17-76) | 32 (9-69) | 36 (14-72) |
| Group Psychotherapy[a] | 8 (2-21) | 10 (2-20) | 9 (2-20) |
| Supportive counselling | 10 (1-25) | 9 (3-23) | 10 (2-23) |

*Note.* CAU = care as usual; IQR = interquartile range; SOS = Self-wise, Other-wise, Streetwise training.
[a] other than SOS-training

## Victimization

Table 1 shows that 76.8% of the participants reported at least one victimization incident in the 12 months prior to baseline assessment. The median number of victimization incidents in the 12 months prior to baseline was three in both treatment groups, with a similar distribution [CAU + SOS training: interquartile range (IQR) = 1-9; CAU: IQR = 1-8].

As shown in Table 3 and Figure 2, significantly more participants in the experimental group achieved treatment response for total victimization compared to the control group. Results for treatment response for violent victimization were inconclusive as to whether a difference was present between groups (Bayes factor = 2.26). There were no significant group differences in treatment response for property victimization (Bayes factor = 0.17).

**Table 3**

Observed percentage of participants with treatment response at 14-mo follow-up and results of the logistic regression analyses for primary outcome treatment response for total victimization and secondary outcomes treatment response for violent victimization and treatment response for property victimization

| | | CAU + SOS | | CAU | | | | 95% CI | |
|---|---|---|---|---|---|---|---|---|---|
| | | % TR | % NV | % TR | % NV | OR | *p* | Lower | Upper |
| Total victimization | ITT | 67.6 | 35.8 | 54.0 | 28.2 | 1.78 | .042 | 1.02 | 3.11 |
| | ITT-adjusted[a] | NA | NA | NA | NA | NA | NA | NA | NA |
| | CCA | 69.7 | 39.0 | 55.8 | 30.8 | 1.82 | .041 | 1.03 | 3.27 |
| Violent victimization | ITT | 79.3 | 58.8 | 68.7 | 52.8 | 1.75 | .092 | 0.91 | 3.34 |
| | ITT-adjusted[b] | 79.3 | 58.8 | 68.7 | 52.8 | 1.90 | .059 | 0.98 | 3.68 |
| | CCA | 81.8 | 62.0 | 70.2 | 54.8 | 1.91 | .055 | 1.00 | 3.76 |
| Property victimization | ITT | 67.7 | 53.7 | 68.9 | 50.9 | 0.95 | .845 | 0.51 | 1.73 |
| | ITT-adjusted[c] | 67.7 | 53.7 | 68.9 | 50.9 | 0.93 | .819 | 0.50 | 1.73 |
| | CCA | 68.7 | 54.0 | 71.2 | 51.9 | 0.89 | .702 | 0.49 | 1.62 |

*Note.* CAU = care as usual; CCA = complete case analysis; CI = confidence interval; ITT = intention-to-treat analysis; NA = not applicable; NV =No victimization incidents at 14-mo follow-up; OR = odds ratio; SOS = Self-wise, Other-wise, Streetwise training; TR = treatment response.

[a] NA since there were no significant predictors of TR for total victimization, other than group allocation.

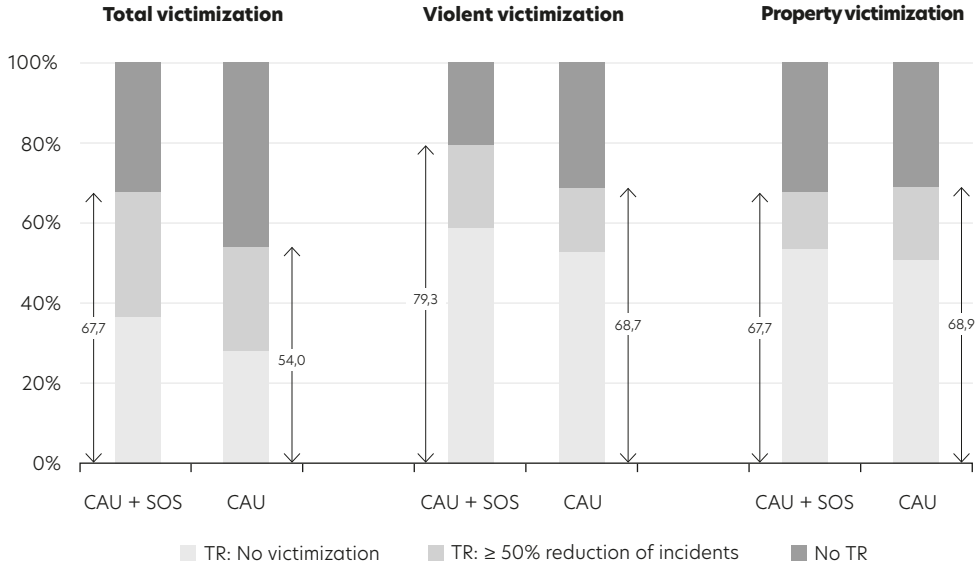
[b] adjusted for education level (lower/middle or high).

[c] adjusted for type of care (inpatient/outpatient).

None of the tested baseline characteristics were significant predictors of treatment response for total victimization. Regarding violent victimization, significantly more participants with a middle or high level of education achieved treatment response compared to participants with a lower level of education [82.6% in middle/high versus 67.3% in lower; odds ratio (OR) = 2.46; 95% confidence interval (CI) = 1.26-4.83; $p$ = .009). Regarding property victimization, significantly more participants who received in-patient care at baseline achieved treatment response compared to participants who received out-patient care at baseline (74.0% in in-patients versus 56.8% in out-patients, OR = 0.46; 95% CI = 0.25-0.84; $p$ = .012). As shown in Table 3, the models adjusted for significant predictors of treatment response yielded very similar results to the unadjusted models.

As a robustness check, complete case analyses were performed in participants who completed the 14-month follow-up assessment ($n$ = 203). As shown in Table 3, results were very similar to those of the intention-to-treat analyses, thereby underlining the robustness of the findings.

**Figure 2.** Observed percentage of participants with treatment response (TR) at 14-mo follow-up.




*Note.* CAU = care as usual; SOS = Self-wise, Other-wise, Streetwise training; TR = treatment response.

**Substance use problems and psychiatric symptom severity**

As shown in Table 4, no significant overall or time-specific intervention effects were found for alcohol use problems, drug use problems or psychiatric symptom severity.

**Table 4**

Observed secondary outcome data over time and results of the linear mixed model analyses for secondary outcome measures psychiatric symptom severity, alcohol use problems and drug use problems

| | | CAU + SOS | | CAU | | | | 95% CI | |
|---|---|---|---|---|---|---|---|---|---|
| | | mean | (SD) | mean | (SD) | *B* | *p* | Lower | Upper |
| AUDIT | Overall | NA | NA | NA | NA | -1.03 | .248 | -2.76 | 0.71 |
| | Baseline | 15.10 | (12.79) | 14.95 | (12.79) | NA | NA | NA | NA |
| | 8-mo follow-up | 10.53 | (8.80) | 12.20 | (10.73) | -1.73 | .075 | -3.64 | 0.18 |
| | 14-mo follow-up | 11.43 | (9.93) | 10.88 | (9.66) | -0.28 | .776 | -2.20 | 1.64 |
| DUDIT | Overall | NA | NA | NA | NA | -0.07 | .940 | -1.84 | 1.70 |
| | Baseline | 19.02 | (12.82) | 17.40 | (13.64) | NA | NA | NA | NA |
| | 8-mo follow-up | 11.39 | (9.80) | 12.26 | (10.09) | -0.27 | .791 | -2.29 | 1.74 |
| | 14-mo follow-up | 11.94 | (8.72) | 11.21 | (9.78) | 0.17 | .873 | -1.86 | 2.19 |
| BPRS-E | Overall | NA | NA | NA | NA | -0.01 | .923 | -1.51 | 1.49 |
| | Baseline | 38.86 | (8.79) | 37.62 | (8.28) | NA | NA | NA | NA |
| | 2-mo follow-up | 35.86 | (8.07) | 36.09 | (8.66) | -0.69 | .476 | -2.57 | 1.20 |
| | 8-mo follow-up | 36.06 | (7.27) | 35.19 | (8.42) | 0.36 | .717 | -1.57 | 2.29 |
| | 14-mo follow-up | 34.59 | (7.58) | 33.78 | (7.25) | 0.43 | .661 | -1.50 | 2.37 |

*Note.* AUDIT = Alcohol Use Disorder Identification Test; BPRS-E = Brief Psychiatric Rating Scale - Expanded; CAU = care as usual; CI = confidence interval; DUDIT = Drug Use Disorder Identification Test; NA = not applicable; SD = standard deviation; SOS = Self-wise, Other-wise, Streetwise training.

# Discussion

CAU + SOS training was more effective in preventing victimization compared to CAU alone. More participants allocated to receive the SOS training as an add-on to CAU achieved a positive treatment response for total victimization 12 months after finalizing the SOS training (68 versus 54%). The current study indicates that, at least for this specific goal, providing dual-diagnosis patients with a relatively brief skills training can lead to improvements, which implies that these vulnerable patients are able to acquire new skills and retain them over time.

With regard to the prevention of property victimization, the SOS training was not effective (Bayes factor = 0.17), whereas for violent victimization, findings were inconclusive as to whether there was a difference in treatment response (79 versus 69%, Bayes factor = 2.26). These findings suggest that the treatment effect on total victimization may have been due mainly to a reduction in the number of violent victimization incidents. This might be explained by the type of skills addressed in the SOS training: although the module Streetwise is focused on reducing vulnerability to both property and violent victimization, the modules Self-wise and Other-wise target skills that are have been related mainly to violent victimization in previous research, and not to property victimization (de Waal et al., 2018; Messman-Moore et al., 2013).

None of the tested baseline characteristics (demographics, type of care, past-year victimization, type and number of DSM-IV diagnosis) predicted treatment response for total victimization. More participants with a middle or high level of education achieved treatment response for violent victimization compared to those with a lower level of education. Individuals with a middle or high level of education may have benefitted more from the treatments offered, and therefore may have acquired more skills that help to reduce vulnerability for violent victimization. More participants who received in-patient care at baseline achieved treatment response for property victimization compared to those who received out-patient care at baseline. Possibly, those in in-patient care have learned from codes with regard to taking care of personal belongings, for instance, by locking the door of one's room when one is away.

No between-group differences were found regarding alcohol and drug use problems and psychiatric symptom severity between CAU and CAU + SOS training. Although there is evidence for the effectiveness of disorder-specific treatments to reduce symptom severity of PTSD (Roberts, Roberts, Jones, & Bisson, 2016) in individuals with co-occurring substance use disorders, our finding is in line with a Cochrane review by Hunt et al. (2013) indicating that there is no compelling evidence for any

psychosocial intervention to reduce substance use or improve mental state in patients with substance use disorders and severe mental illness. Victimization has been linked to substance use and psychiatric symptom severity in both patients with severe mental illness (Khalifeh et al., 2016; Maniglio, 2009b) and patients with substance use disorders (Neale et al., 2005; Pirard et al., 2005; A. Stevens et al., 2007; Walton et al., 2002), and therefore one would expect a reduction of victimization incidents to be beneficial for the patients' mental health and addiction recovery. However, in a prior study using baseline data from the current study we have shown that substance use problems and psychiatric symptom severity were not independently associated with victimization in dual-diagnosis patients (de Waal et al., 2018). A study among African Americans reported that victimization in young adulthood predicted greater substance use in mid-life (Doherty, Robertson, Green, Fothergill, & Ensminger, 2012). However, this pathway was not found for those raised in a disadvantaged neighbourhood who lived in impoverished households. The authors suggested that those inured to life's adversities, with lower expectations about one's life chances, may be less negatively affected by victimization. The same could apply to dual-diagnosis patients, and this could explain that, in the current study, the reduction of victimization was not accompanied by a reduction of alcohol and drug use problems. It has consistently been demonstrated that life stressors such as impairment of intimate relations, family relation, and vocational functioning can negatively impact substance use problems (Brown et al., 1990; Canton et al., 1988; Vuchinich & Tucker, 1996). However, there is a lack of studies examining the short- and long-term impact of victimization on substance use problems and mental state in dual-diagnosis patients. Prospective cohort studies should be conducted to examine the impact of different types of victimization while taking into account other life stressors.

The SOS training was successfully implemented in in-patient as well as out-patient care facilities and positively rated by participants. Reasons for loss to treatment were mainly practical, and unrelated to the content of the SOS training. Although adding the SOS training to CAU is more effective in preventing victimization compared to CAU alone, the majority of participants in the experimental condition still experienced victimization during the follow-up period. Further studies should be conducted that include an active control group and a more extensive assessment of treatment outcome, and examine working mechanisms, long-term effects, outcome predictors and potential gains by intensifying the SOS training with more frequent sessions or with follow-up booster sessions. To further optimize the content of the SOS training, focus groups should be organized with participants who were randomized to receive the SOS training, but were nevertheless victimized during the follow-up period.

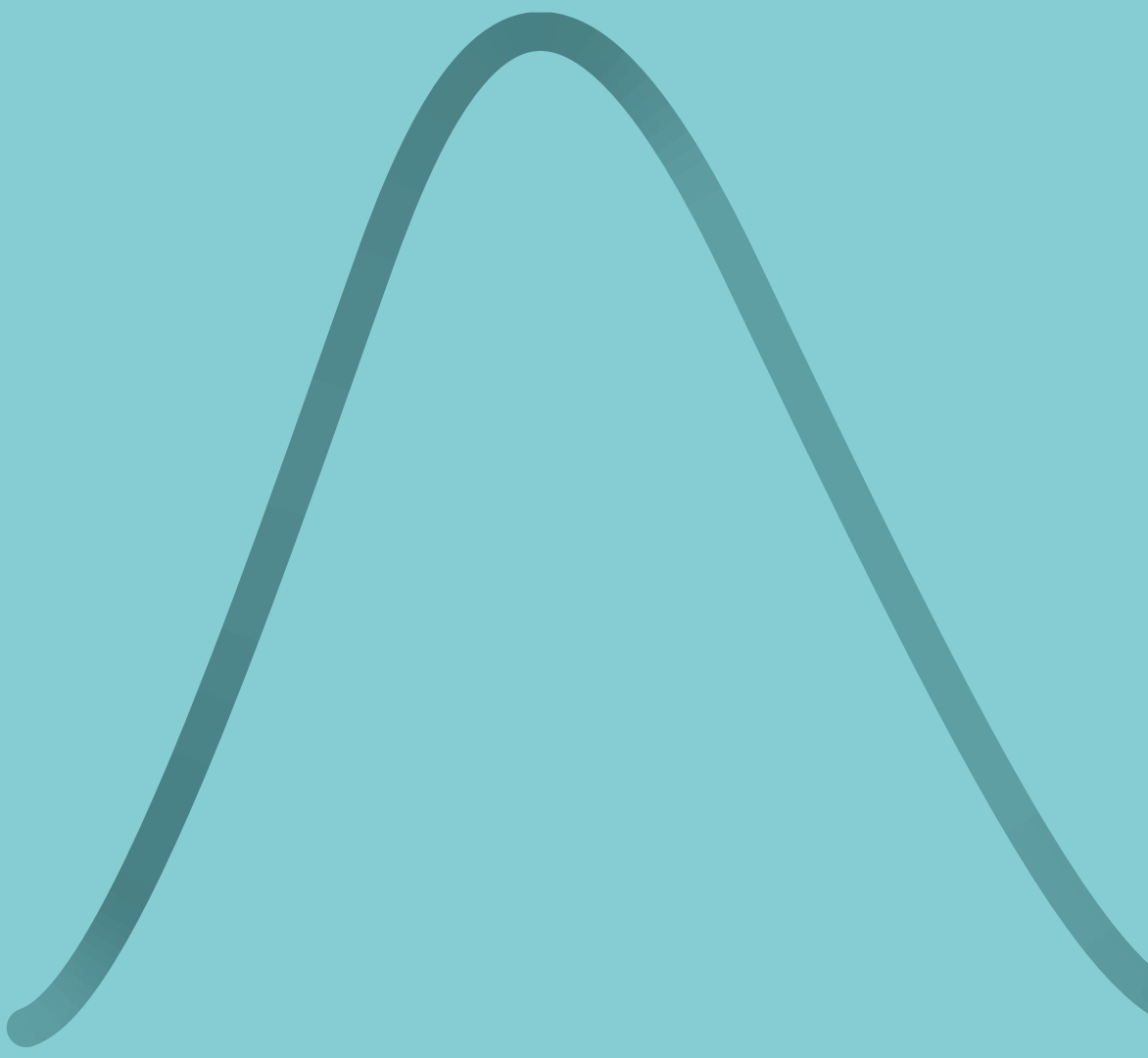
The SOS training can be implemented as add-on to CAU for dual-diagnosis patients in order to prevent victimization. However, we would like to emphasize that the SOS training is by no means a substitute for trauma treatment and that patients suffering from post-traumatic stress disorder should always receive evidence-based psychotherapeutic interventions (Roberts et al., 2016).

The strengths of this study are the sample size, the heterogeneity of the sample, the limited loss to follow-up and the generalizability to clinical practice. The study also has several limitations. First, there was a considerable loss to treatment, which is a typical challenge in clinical trials in dual-diagnosis patients (Hunt et al., 2013). Secondly, the study was powered to detect differences in the primary outcome and may therefore have been underpowered to detect subtle differences in secondary outcomes. Thirdly, the study had a relatively short follow-up period of 14 months. Fourthly, the study did not incorporate independent fidelity ratings and therefore we are unable to verify whether the intervention was delivered as intended. Finally, there may be substantial variations in CAU between countries (Hunt et al., 2013), which may limit the generalizability of our findings to other countries. In the current study, CAU generally consisted of pharmacotherapy combined with individual psychotherapy, group psychotherapy and/or supportive counselling.

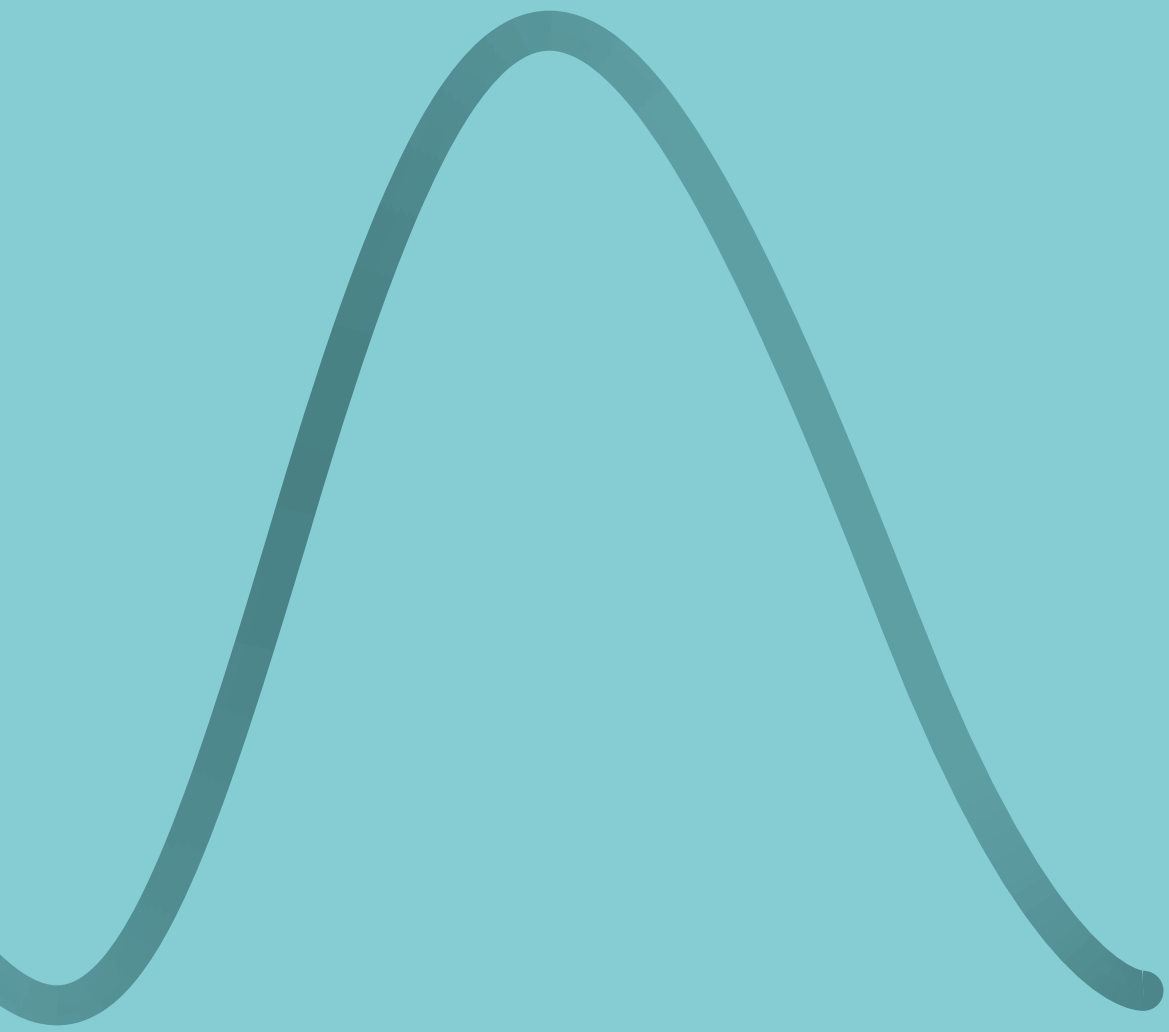
**Conclusions**

In dual-diagnosis patients, adding SOS training to CAU is more effective in preventing victimization compared to CAU alone. SOS training can be implemented in addiction-psychiatry services in order to prevent future victimization in these patients.

# Part III



# Victimization in female college students



# Chapter 8

## Changes in risk perception after sexual victimization: are we following the right track?

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Under review.

## Abstract

Sexual abuse is a major public health concern with detrimental effects on both mental and physical health. Several studies have reported that victims of sexual abuse have a decreased ability to recognize risk in potentially threatening situations compared to non-victims, although others were not able to replicate this finding. In addition, although emotion dysregulation has been linked to risk perception and to sexual victimization, results have been contradictory. In order to strengthen the theoretical framework needed for the development of interventions to reduce women's likelihood of sexual assault, it is crucial to further examine the role of emotion dysregulation in relation to sexual victimization history and risk perception. The aim of the current study was to examine cross-sectional associations between sexual victimization, emotion regulation difficulties, and risk perception. In our sample of 276 female college students, 40% reported lifetime sexual victimization, 14% reported recent sexual victimization and 12% reported childhood sexual abuse. In contrast to our hypothesis, we did not find risk perception to be related to lifetime sexual victimization, childhood sexual victimization, or recent sexual victimization. In addition, we did not find evidence for the expected relationship between sexual victimization, risk perception, and emotion regulation difficulties. The discussion of the current study specifically highlights the need for a clear conceptualization of risk perception and provides recommendations for future studies. More sophisticated measurement methods could lead to a higher applicability of findings to real-life situations. The potential relationships between victimization, risk perception, and emotion dysregulation need further clarification for reaching the ultimate goal of contributing to the prevention of victimization.

# Introduction

Sexual abuse is a major public health concern with detrimental effects on both mental and physical health (Chen et al., 2010; Maniglio, 2009a), which affects women across all age groups. In childhood, global prevalence rates of sexual abuse are estimated at 18.0% in girls, compared to 7.6% in boys (Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011). In a large cohort of 17-year-old girls in the United States, 26.6% had experienced lifetime sexual abuse (Finkelhor, Shattuck, Turner, & Hamby, 2014). Across all age groups, young adult women aged between 18 and 24 have a disproportionally high risk of becoming victims of sexual violence (Sinozich & Langton, 2014). Research in college samples has documented prevalence rates of unwanted sexual contact ranging from 1.8% to 34%, with most studies reporting rates over 20% (see Fedina, Holmes, & Backes, 2018, for a review). Since the blame of sexual abuse lies solely with the perpetrator, preventive efforts aimed at potential offenders remain a priority. However, understanding why some women are more vulnerable to become a victim of sexual abuse compared to others is important as well, since it can contribute to the development of interventions aimed at increasing women's resilience and reducing the likelihood of sexual assault.

Studies have consistently reported that women with a history of childhood or adolescent sexual abuse are at increased risk for revictimization in adulthood (Classen et al., 2005; Gidycz, Coble, Latham, & Layman, 1993). In a longitudinal study, Gidycz et al. (1993) showed that women with a history of rape or attempted rape in adolescence were almost twice as likely to become victim of a sexual assault during college compared to other women. A meta-analysis of sexual revictimization across various samples (i.e., student, clinical, and population samples) reported an overall *Cohen's d* effect size of .59 for sexual revictimization (Roodman & Clum, 2001). In an attempt to explain the relation between a history of sexual abuse and subsequent revictimization, a growing body of research has pointed out the process of risk perception: the ability to perceive risk in potentially threatening situations (e.g., Gidycz et al., 2006).

**Risk perception**

Several studies have reported that victims of sexual abuse have a decreased ability to perceive risk in potentially threatening situations compared to non-victims (see Gidycz et al., 2006, for a review). However, other studies were not able to replicate this finding, and the operationalization and assessment of risk perception varies considerably across studies (Gidycz et al., 2006).

Most empirical studies on risk perception have used vignette methodology, in which participants first listen to or read a scenario describing a hypothetical interaction, and are asked to indicate to what extent they consider the situation as risky or threatening (see Rinehart & Yeater, 2015, for a review). A frequently used measure of risk recognition is the audiotaped vignette developed by Marx and Gross (1995). The vignette describes a hypothetical interaction between a man who increasingly uses coercion, and a woman who persistently refuses, which eventually culminates in a date rape. Participants are asked to stop the tape when they believe the man has "gone too far". In an early, retrospective study among college women, multiple-incident victims demonstrated longer response latencies than non-victims and single-incident victims, suggesting delays in risk recognition (Wilson, Calhoun, & Bernat, 1999). In another retrospective study that used the same audiotaped vignette, university women with a history of adolescent or adult sexual victimization had longer response latencies than women without a history of sexual victimization (Soler-Baillo, Marx, & Sloan, 2005). Contrarily, a study that attempted to replicate these findings in a community sample did not find a difference between victims and non-victims in risk perception (Chu, DePrince, & Mauss, 2014). Other studies have used largely similar written or videotaped vignettes in which participants are asked to rate how risky a situation is (see Rinehart & Yeater, 2015, for a review). Yeater, Treat, Viken, and McFall (2010) found an association between victimization history and impaired risk perception, whereas others did not (Breitenbecher, 1999; Vanzile-Tamsen, Testa, & Livingston, 2005). Yet another study found better risk perception in participants who were victimized multiple times compared to single-incident victims (Yeater & O'donohue, 2002). In summary, these studies have provided mixed results regarding impaired risk perception in victims of sexual abuse.

Other studies on risk perception have used written or videotaped vignettes in which participants are asked to indicate at which moment in the scenario they would leave the situation. This so-called *leave score* represents a somewhat different conceptualization of risk perception, which is more related to *responding* to perceived threat, instead of *perceiving* the threat (Walsh et al., 2012). Messman-Moore and Brown (2006) developed the Risk Perception Survey (RPS): a written vignette consisting of two scenarios – one with a male acquaintance, and one with a male stranger – that gradually become more risky, and end in forced sexual intercourse. Participants are instructed to imagine themselves interacting with the man in the scenario, and to indicate when they would leave the situation. In their study among university women, victims of adult sexual victimization reported leaving both scenarios later than both non-victims and victims of child sexual victimization only. Moreover, women who reported leaving the acquaintance scenario later at baseline were more likely to report having been victimized during the 8-months follow-up period (Messman-Moore

& Brown, 2006). Correspondingly, a recent study found that female college students with a history of adolescent or adult sexual assault reported leaving the acquaintance scenario of the RPS later than students without a history of sexual assault (Neilson et al., 2018). In contrast with these results, however, other studies found no association between victimization history and leaving the acquaintance scenario later (Carlson & Duckworth, 2016; Eshelman, Messman-Moore, & Sheffer, 2015). One study suggested that leave scores may be relevant only to substance-related victimization (i.e., victimization when unable to give consent or resist due to alcohol or drugs), which was positively correlated with leaving the scenario later — as opposed to forcible assault (i.e., victimization when being threatened or physically forced) (Eshelman et al., 2015).

**Emotion dysregulation and risk perception**

Although results remain mixed, studies have provided some evidence to support a relationship between sexual victimization and decreased risk perception. In an attempt to further explain this association, researchers have examined the role of emotion regulation in this relationship (Carlson & Duckworth, 2016; Walsh et al., 2012). Emotion regulation refers to "the processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (Thompson, 1994). In their theoretical model, Marx et al. (2005) described the putative role of emotion regulation and risk recognition in the association between childhood sexual abuse and adult revictimization. The authors argued that childhood sexual abuse elicits emotion dysregulation difficulties (e.g., unsuccessful attempts to regulate fear or arousal, and avoidance of aversive emotional states), and theorized that these difficulties may in turn impair one's ability to recognize risk cues and to adequately defense oneself, thereby increasing one's vulnerability to future revictimization.

To our knowledge, only two previous studies have examined the associations between sexual victimization, emotion dysregulation, and risk perception. Walsh et al. (2012) explored these associations in a large sample of female college students ($N$ = 714). First, they found a weak, but statistically significant correlation ($r$ = .09) between lifetime sexual victimization and risk perception as measured with the *leave score* in the acquaintance scenario of the RPS. Second, they found weak, but significant correlations between these variables and most aspects of emotion dysregulation (all $r \leq .15$), as measured with the Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004). Third, they found that the correlation between lifetime sexual victimization was partly explained by limited access to emotion regulation strategies and impulse control problems. In line with the model proposed by Marx et al. (2005), the authors suggest that victims who experience these emotion regulation difficulties may be focused on their emotional state to such an extent that they fail to detect environmental risk cues

(Walsh et al., 2012). However, a more recent study found contradictory results. Carlson and Duckworth (2016) also examined the association between victimization history (defined as no victimization history, one victimization experience, and two or more victimization experiences), emotion dysregulation, and risk perception in a sample of 113 female college students. In contrast to previous studies (Messman-Moore & Brown, 2006; Walsh et al., 2012), the authors found no association between victimization history and the leave scores of both scenarios of the RPS. Victimization history was significantly correlated with emotion dysregulation ($r$ = .35). Furthermore, emotion dysregulation was significantly correlated with the leave score of the RPS stranger scenario ($r$ = -.23), but not the acquaintance scenario. Remarkably, their results indicate that women with higher levels of emotion dysregulation left the stranger scenario earlier than women with lower levels of emotion dysregulation, which contrasts the results of Walsh et al. (2012) regarding the acquaintance scenario.

### The current study

In summary, previous studies on the association between sexual victimization history and risk perception have reported mixed results. Hence, it remains unclear whether sexual victimization is related to risk perception. In addition, although emotion dysregulation has been linked to victimization (Carlson & Duckworth, 2016; Messman-Moore et al., 2013; Walsh et al., 2012), results have been contradictory in terms of the link between emotion dysregulation and risk perception. It is crucial to further examine the role of emotion dysregulation in relation to sexual victimization history and risk perception, in order to strengthen the theoretical framework needed for the development of interventions to reduce women's likelihood of sexual assault. Therefore, the current study aims to examine the associations between sexual victimization – differentiating between lifetime, recent, and childhood sexual abuse –, emotion regulation difficulties, and risk perception, as measured with the *leave score* of the RPS acquaintance scenario (Messman-Moore & Brown, 2006). In line with Walsh et al. (2012), we hypothesized that lifetime sexual victimization would be positively associated with both emotion regulation difficulties and the *leave score*. Furthermore, we hypothesized that emotion regulation difficulties would be positively associated with the *leave score*.

## Methods

### Design and procedures

This cross-sectional study was conducted at the VU University, Amsterdam, the Netherlands, in collaboration with the research department of Arkin mental health care, Amsterdam, the Netherlands. The data collection took place in April and May

2017. College students were recruited by research assistants through flyers posted on campus, Facebook, and online research recruitment platforms. All participants provided written informed consent prior to participation. Participants completed a set of self-report questionnaires administered in Net-Q: an online secured survey platform. Each assessment was supervised by one of two research assistants (MSc or BSc) and took approximately 45 minutes. Participants were compensated with €10 or 50 minutes course credit.

**Participants**

The inclusion criteria were: being female, being currently studying in the Netherlands, and having sufficient understanding of the Dutch language to understand and complete self-report questionnaires. The study sample consisted of 276 female college students with a mean age of 21.7 years (*SD* = 2.38). As shown in Table 1, participants were predominantly born in the Netherlands (91.7%), single (66.3%), living with their parents (42.0%) or with roommates (35.1%), and studying psychology (50.4%).

**Measures**

***Lifetime, Recent, and Childhood Sexual Victimization***

Lifetime sexual victimization and recent sexual victimization were measured with a subset of questions from the section 'sexual assault' of the Safety Monitor: a survey that is developed by the Dutch Ministry of Security and Justice (Akkermans et al., 2014) The Safety Monitor is the Dutch equivalent of the International Crime Victims Survey (ICVS; Killias, 2010), and is used by Statistics Netherlands to measure victimization on a large scale. There are no psychometric properties available. In the Safety Monitor, sexual assault is explained as being touched or grabbed, with sexual intentions, in an offensive way. Participants were asked to indicate whether this had ever happened to them to measure lifetime sexual victimization (yes/no). Recent sexual victimization was defined as having experienced a sexual assault in the 12 months preceding the assessment. The Safety Monitor does not provide scores to determine the severity of victimization experiences. More detailed questions were used for descriptive purposes only. In line with Walsh et al. (2012), sexual victimization was operationalized dichotomously.

**Table 1**

Demographic characteristics of the total study sample (*N* = 276)

| | *n* | % |
|---|---|---|
| Country of birth | | |
| Netherlands | 253 | 91.7 |
| Other European country | 12 | 4.3 |
| Other | 11 | 4.0 |
| Relationship status | | |
| Single | 183 | 66.3 |
| In a relationship | 93 | 33.7 |
| Living situation | | |
| With parent(s)/caregiver(s) | 116 | 42.0 |
| With roommates | 97 | 35.1 |
| Alone | 36 | 13.0 |
| With partner | 26 | 9.4 |
| Other | 1 | 0.3 |
| Field of study | | |
| Psychology | 139 | 50.4 |
| Pedagogical and other social sciences | 41 | 14.9 |
| Medicine/health sciences | 24 | 8.7 |
| Management/business/economics | 23 | 8.3 |
| Communication science | 15 | 5.4 |
| Law | 12 | 4.3 |
| Natural/formal sciences | 11 | 4.0 |
| Other | 11 | 4.0 |

Childhood sexual abuse (CSA) was measured with the CSA-subscale of the Dutch version of the Childhood Trauma Questionnaire (CTQ-SF; Bernstein et al., 2003; Thombs, Bernstein, Lobbestael, & Arntz, 2009). The CTQ-SF is a self-report questionnaire with items that are rated on a 5-point Likert-type scale with response options ranging from "Never true" to "Very often true". Originally, the CSA-subscale consisted of 5 items; however, previous psychometric analyses of the Dutch version indicated that one item of the CSA-subscale (i.e., "During my youth, I was molested by someone") had to be

removed in the Dutch version of the questionnaire (Thombs et al., 2009). The sum score of the CSA-scale was calculated as the sum of the 4 remaining items, multiplied by 5/4. The CTQ-SF manual provides several cut-off scores to describe the presence/absence of abuse, sensitive to different levels of abuse severity. Cut-off scores specifically for the Dutch version of the CTQ-SF have not yet been developed. In the current study, the cut-off score of >6 was used to indicate presence of CSA. This cut-off score corresponds best to the English CTQ-SF since presence of sexual abuse is indicated when a participant answers affirmatively on at least one of the sexual abuse items. Validity and reliability of the Dutch version of the CTQ-SF are good (Spinhoven et al., 2014; Thombs et al., 2009). In the current study, internal consistency was excellent for the CSA-scale (α = .91).

***Emotion dysregulation***

Emotion dysregulation was measured with the Dutch version of the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004; Neumann et al., 2010). The DERS is a 36-item self-report questionnaire that evaluates emotion regulation difficulties across multiple domains. The DERS showed high internal consistency and good test-retest reliability in a US student sample (Gratz & Roemer, 2004). In the current study, all six subscales were used, which showed good to excellent internal consistency: non-acceptance of emotional responses (α = .89), difficulties engaging in goal-directed behavior (α = .87), impulse control difficulties (α = .87), lack of emotional awareness (α = .81), limited access to emotion regulation strategies (α = .90), and lack of emotional clarity (α = .84).

***Risk perception***

Risk perception was measured with the Risk Perception Survey (RPS; Messman-Moore & Brown, 2006). The RPS is a written vignette describing a college party scene that culminates in forced rape by an acquaintance. The vignette consists of 25 statements that become progressively riskier, and include both clear (sexual comments, verbal persuasion) and ambiguous (alcohol consumption, physical isolation) risk factors for sexual victimization. Each statement is presented sequentially on a computer. Participants are instructed to imagine that they are participating in each activity as described, and to press a button indicating one of four possible responses: 1) continue in the scenario; 2) uncomfortable and continue in the scenario; 3) leave the scenario; 4) uncomfortable and leave the scenario. The primary variable in the analyses is the *leave score*, which is defined as the statement (screen) in the scenario at which the participant indicated she would leave the scenario — regardless of whether or not she indicated feeling uncomfortable. Hence, for women who chose to complete the entire scenario, a *leave score* of 26 was assigned. The display of the scenario was terminated

when a participant had indicated to leave the scenario. For the purpose of this study, the RPS was translated into Dutch, with permission of the authors. To obtain conceptual equivalence, three researchers independently translated the statements into Dutch and formed a panel to resolve discrepancies in these forward translations. Subsequently, an independent, professional translator translated the statements back into English. One of the researchers discussed discrepancies with the translator until consensus was reached.

**Ethics**

The study was reviewed and approved by the ethics committee of the VU University, Amsterdam, The Netherlands (VCWE-2017-009R1). Participation in the study was voluntary, and all participants provided written informed consent.

**Statistical analyses**

Data were analyzed using SPSS Statistics 24.0. There were no missing values. Pearson correlations and point-biserial correlations were used to examine associations between lifetime sexual victimization (yes/no), recent sexual victimization (yes/no), CSA (yes/no), emotion regulation difficulties (continuous), and the outcome measure: the *leave score* (continuous). Computing the point-biserial correlation between one dichotomous and one continuous variable (e.g., lifetime sexual victimization (yes/no) and the *leave score*) is equivalent to comparing two groups in an independent t-test with a continuous dependent variable.

# Results

**Victimization Rates and Characteristics**

Approximately 40% of the sample ($n$ = 111) reported lifetime sexual victimization, and approximately 14% of the sample ($n$ = 38) reported sexual assault in the year preceding the assessment. Of the women who reported past year sexual assault, 47% ($n$ = 18) reported that it had occurred once in the past year, 26% ($n$ = 10) reported that it had occurred twice, and 26% ($n$ = 10) reported that it had occurred between 3 and 10 times. Approximately 58% of the victims of past year sexual assault ($n$ = 22) reported assault by a stranger only, 29% ($n$ = 11) reported assault by an acquaintance only, and 13% ($n$ = 5) reported assault by a stranger as well as assault by an acquaintance in the past year. Approximately 47% of the victims of past year sexual assault ($n$ = 18) reported to have experienced assault only while being under the influence of alcohol and/or drugs, 32% ($n$ = 12) reported to have experienced assault only while being sober, and 21% ($n$ = 8) reported to have experienced assault both while being under the influence of alcohol and/or drugs and while being sober.

Approximately 12% of the sample (*n* = 32) reported CSA. For women reporting CSA, the mean CTQ sexual abuse score was 11.2 (*SD* = 5.1), which falls within the moderate range of sexual abuse severity. Of the 38 women who reported past year sexual assault, 8% (*n* = 3) reported CSA.

Mean scores for each of the DERS subscales ranged from 10.7 (*SD* = 4.4) for lack of emotional clarity to 16.8 (*SD* = 6.4) for limited access to emotion regulation strategies, which is consistent with DERS scores observed among a US sample of female college students (Gratz & Roemer, 2004).

On average, participants reported that they would leave the scenario at the 13th screen (*SD* = 6.8), which corresponds to the portion of the vignette when the man invites the participant to go with him to his apartment. The modal screen that participants left on was 9 (*n* = 53), which corresponds to the portion of the vignette when one of the participant's friends gets sick at the party and the rest of the friends decide to take her home. This corresponds to the modal screen observed in Walsh et al. (2012). Other screens at which relatively many participants decided to leave the scenario were the 10$^{th}$ screen (*n* = 30), which corresponds to the portion of the vignette when the participant's friends are leaving and agree to come back for the participant later, and the 13$^{th}$ screen (*n* = 29), which is described at the beginning of this paragraph. Approximately 10% of the sample (*n* = 28) chose to continue all the way through the scenario, until the portion of the vignette when the participant tries to push the man off, but he has sexual intercourse with her.

**Bivariate Associations Between Victimization, Emotion Dysregulation, and Risk Perception**

As shown in Table 2, all three measures of sexual victimization – lifetime sexual victimization, recent sexual victimization, and CSA – were not significantly associated with leaving the risk vignette later (the *leave score*). The mean *leave score* for victims of lifetime sexual victimization (*n* = 111) was 13.4 (*SD* = 7.3), and the mean *leave score* for non-victims (*n* = 165) was 12.5 (*SD* = 6.5). For both groups, the modal screen that participants left on was 9. The mean *leave score* for victims of recent sexual victimization (*n* = 38) was 13.5 (*SD* = 7.2), and the mean *leave score* for women without past year sexual victimization (*n* = 238) was 12.7 (*SD* = 6.8). The mean *leave score* for victims of CSA (*n* = 32) was 15.0 (*SD* = 7.9), and the mean *leave score* for women without history of CSA (*n* = 244) was 12.6 (*SD* = 6.6). Furthermore, lifetime sexual victimization, recent sexual victimization, and CSA were not significantly associated with any of the types of emotion regulation difficulties, except for a weak negative association between lifetime sexual victimization and limited access to emotion regulation strategies ($r_{pb}$ = -.13). Finally, the *leave score*

was weakly negatively correlated with impulse control difficulties ($r$ = -.12) and was not significantly correlated with any of the other types of emotion regulation difficulties.

**Table 2**

Correlations between sexual victimization, emotion dysregulation, and Leave score in female college students ($N$ = 276)

| | LSV | RSV | CSA | EN | GDB | IC | EA | STRAT | EC | Leave |
|---|---|---|---|---|---|---|---|---|---|---|
| LSV | 1.0 | .49** | .28** | .01 | -.11 | -.06 | .00 | -.13* | .00 | .07 |
| RSV | | 1.0 | -.05 | -.04 | -.06 | .03 | -.04 | -.08 | .05 | .04 |
| CSA | | | 1.0 | .10 | .01 | .11 | -.09 | .10 | .06 | .12 |
| EN | | | | 1.0 | .43** | .49** | .10 | .65** | .52** | -.04 |
| GDB | | | | | 1.0 | .50** | -.05 | .59** | .30** | -.03 |
| IC | | | | | | 1.0 | -.01 | .56** | .42** | -.12* |
| EA | | | | | | | 1.0 | .04 | .27* | -.01 |
| STRAT | | | | | | | | 1.0 | .54** | -.07 |
| EC | | | | | | | | | 1.0 | -.11 |
| Leave | | | | | | | | | | 1.0 |

*Note.* CSA = childhood sexual abuse; EA = lack of emotional awareness; EC = lack of emotional clarity; EN = emotional nonacceptance; GDB = difficulties with goal-directed behavior; IC = impulse control difficulties; Leave = RPS leave score; LSV = lifetime sexual victimization; RSV = recent sexual victimization; STRAT = limited access to emotion regulation strategies.
* p < .05; ** p < .01.

# Discussion

In a sample of female college students, 40% reported lifetime sexual victimization, 14% reported recent sexual victimization, and 12% reported CSA, which largely corresponds to previous studies on prevalence of sexual victimization in young adult women (Fedina et al., 2018; Gidycz, Hanson, & Layman, 1995; Stoltenborgh et al., 2011). In contrast to our hypothesis, we did not find an association between lifetime sexual victimization and risk perception. In addition, we did not find risk perception to be related to childhood sexual victimization or recent sexual victimization.

These findings are in contrast with an earlier study by Walsh et al. (2012), in which lifetime sexual victimization was associated with impaired risk perception. There are several

possible explanations for this discrepancy. One explanation is that no meaningful relationship exists between sexual victimization history and impaired risk perception. The observed correlation in Walsh et al. (2012) was very weak ($r$ = .09) and generally similar to the correlation observed in the current study ($r$ = .07), and may have been statistically significant due to a relatively large sample size ($N$ = 714) compared to ours ($N$ = 276). Earlier studies have provided mixed results: although several studies have found evidence for the existence of a relationship between sexual victimization history and impaired risk perception (Neilson et al., 2018; Soler-Baillo et al., 2005; Walsh et al., 2012; Wilson et al., 1999; Yeater et al., 2010), a considerable amount of others studies have not (Breitenbecher, 1999; Carlson & Duckworth, 2016; Chu et al., 2014; Vanzile-Tamsen et al., 2005). Moreover, one study even reported improved risk perception in participants who were victimized multiple times compared to single-incident victims (Yeater & O'donohue, 2002). Studies that provide evidence for an association between victimization and risk perception may be overrepresented in the literature due to publication bias: the tendency for authors to submit, and for editors to accept a study for publication based on the direction or strength of its findings (Dickersin, 1990). If publication bias is present, researchers could currently be overestimating the probability of a relationship between victimization and risk perception.

Another explanation for the inconsistency of findings could be the varying ways in which risk perception is conceptualized and measured. While some studies, including ours, examined when a participant would leave a situation (Carlson & Duckworth, 2016; Neilson et al., 2018; Walsh et al., 2012), others have asked participants when they would feel on guard or uncomfortable in a situation (Breitenbecher, 1999; Messman-Moore & Brown, 2006), or asked participants to explicitly identify risk factors or the degree of risk depicted in vignettes (Vanzile-Tamsen et al., 2005; Yeater & O'donohue, 2002). As outlined in the introduction, indicating when one would leave a scenario is more related to *responding* to perceived threat, instead of *perceiving* the threat. Remarkably, a recent study that used the same risk perception vignette as the current study was unable to confirm the expected association between the perceived likelihood of incapacitated sexual assault and the decision to leave a situation (Neilson et al., 2018). This suggests that women may be able to perceive risk cues, but may decide to continue through the scenario due to other concerns, such as worries about ruining the relationship with the man or other psychological barriers (Norris, Nurius, & Dimeff, 1996). This highlights the urgent need for a clear conceptualization of risk perception and the cognitive processes involved. However, the mixed findings cannot be fully explained by differences in conceptualization and measurement methods, since studies that used the same measurement instruments have also found contradictory results (Carlson & Duckworth, 2016; Neilson et al., 2018; Walsh et al., 2012).

The inconsistency of findings could also be explained by differences in the measurement and operationalization of sexual victimization. In most studies mentioned, including the current study, sexual victimization by definition included physical contact between the perpetrator and the victim. The majority of studies incorporated the Sexual Experiences Survey (SES; Koss & Gidycz, 1985); however, many studies used a self-modified version and/or combine the SES with other questionnaires to construct a variable sexual victimization, either operationalized as a dichotomous variable (Soler-Baillo et al., 2005; Walsh et al., 2012), categorical variable (e.g., no victimization, single incident, or multiple victimization; (Carlson & Duckworth, 2016; Chu et al., 2014; Wilson et al., 1999), or continuous variable based on severity (Neilson et al., 2018; Vanzile-Tamsen et al., 2005; Yeater et al., 2010). As with risk perception measures, the mixed findings cannot be fully explained by differences in measurement and operationalization of sexual victimization, since studies using similar operationalizations have also reported contradictory results. It is not always clear why authors chose a specific operationalization of sexual victimization. In future studies, researchers should operationalize their study variables a priori, and ideally even register them, to prevent information bias and increase reliability.

In contrast to our hypothesis and previous research (Carlson & Duckworth, 2016; Messman-Moore et al., 2013; Walsh et al., 2012), we did not find evidence for the expected relationships between CSA, recent or lifetime sexual victimization, and emotion regulation difficulties. Furthermore, we did not find evidence for the expected relationship between emotion regulation difficulties and impaired risk perception. These results do not correspond with the theoretical model proposed by Marx et al. (2005), who hypothesized that victims of CSA develop emotion regulation difficulties, and, consequently, become less able to recognize risk cues. Our findings are also inconsistent with those found in the study of Walsh et al. (2012) among college women in the United States. Although differences between women from Europe and women from the U.S. could be assumed to have influenced the results, there was no indication of a cross-cultural difference: both the emotion dysregulation scores and the modal *leave score* were highly similar in both samples. The inconsistent results may be explained by the difference in sample size, since the observed correlations in their study were all weak (all $r \leq .15$), and may have reached statistical significance due to the large sample size. Our findings are partly in line with a recent study in a U.S. sample by Carlson and Duckworth (2016), which was also unable to detect an association between emotion dysregulation and leaving an increasingly risky scenario involving a male acquaintance. Carlson and Duckworth (2016) did report an association between emotion dysregulation and leaving a 'stranger scenario', but in the opposite direction of Walsh et al. (2012): women with higher levels of emotion dysregulation left the scenario earlier.

In summary, the current study found no evidence for relationships between sexual victimization, emotion dysregulation, and risk perception. Although absence of evidence should not be interpreted as evidence of absence, our findings reflect the inconsistent results of previous research. Overall, it remains unclear whether a relationship between sexual victimization and risk perception exists. With regard to the potential role of emotion regulation in this relationship, results of scarce previous research are particularly contradictory.

Future studies are needed to clarify these mixed findings in the literature, which should use improved assessment of risk perception. Unexplored opportunities lie in the use of more sophisticated techniques to measure risk perception and risk response, such as virtual reality. Studies testing the practicing of rape-resistance skills found that interaction with a virtual aggressor is realistic enough to trigger an emotional response, and made participants feel more emotionally involved compared to when the same scenario is played with an actor (Jouriles et al., 2009; Jouriles, Rowe, McDonald, Platt, & Gomez, 2011). Presenting a risky situation in a virtual environment may prompt a more realistic reaction, and thus result in a more valid measure of risk perception and risk response compared with a written or audiotaped vignette, since it does not depend on participants' ability to imagine a situation and then forecast one's own behavior (Jouriles et al., 2011). In addition, virtual reality enables more flexibility, since scenarios can be easily updated to reflect current language and trends in college women's social and dating experiences and to incorporate potential new insights into risk cues. A recent study by Loranger and Bouchard (2017) showed that an experiment in which a participant is sexually assaulted in a virtual environment is tolerated by participants, also by those who have been victims of sexual assault in the past. None of the participants mentioned having been overly troubled by the experiment or needing post-experiment support, indicating that virtual reality can be safely used. Virtual reality has successfully been used in experiments examining women's responses in sexually threatening situations (Jouriles et al., 2011) and negative consequences of intervening as a bystander in risky situations (Krauss et al., 2017). As virtual reality equipment is becoming more affordable, the potential of using it to measure risk perception and risk response should be further explored.

**Limitations**

The current study added to the sexual victimization literature by examining associations that demonstrated highly mixed findings in previous studies, in a European sample. Several limitations of the current study should be addressed in future studies. First, since participants were predominantly born in the Netherlands, were all well-educated, and predominantly studying psychology, findings are not necessarily applicable to

young women in general. Replication of the current study in a more diverse sample of women would increase the generalizability of the findings. Second, future studies should inquire about sexual orientation. Possibly, the risk perception vignette has less validity for lesbian women compared to heterosexual or bisexual women. Third, we did not examine risk perception in a stranger scenario, while 58% of the victims of past year sexual assault reported assault by a stranger only, and a previous study reported distinct findings for a stranger and acquaintance scenario (Carlson & Duckworth, 2016). Finally, since sexual victimization was operationalized as a dichotomous variable, we were unable to make statements about the severity of the incidents.

**Conclusions and recommendations**

Results of the current study indicate that it is yet unclear whether the proposed relationships between sexual victimization, risk perception, and emotion dysregulation exist and if they do, in what direction. This study specifically highlights the need for a clear conceptualization of risk perception. In addition, more sophisticated measurement methods, such as virtual reality, could potentially lead to a higher applicability of findings to real-life situations.

Understanding why some people are more vulnerable to be victimized compared to others is particularly important, since it can contribute to the development of interventions aimed at reducing the likelihood of victimization. Enhancing emotion regulation skills is an important component of two recently developed interventions aimed at reducing risk of victimization in another vulnerable group: people with mental illness (Christ et al., 2018; de Waal et al., 2015). While emotion dysregulation has been linked to victimization (Carlson & Duckworth, 2016; Messman-Moore et al., 2013), it remains yet unclear whether impaired risk perception is involved in this relationship. The potential relationships between victimization, risk perception, and emotion dysregulation need further clarification for reaching the ultimate goal of contributing to the prevention of victimization.

# Chapter 9

## Linking childhood emotional abuse and depressive symptoms: the role of emotion dysregulation and interpersonal problems

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# Abstract

Childhood abuse is a major public health problem that has been linked to depression in adulthood. Although different types of childhood abuse often co-occur, few studies have examined their unique impact on negative mental health outcomes. Most studies have focused solely on the consequences of childhood physical or sexual abuse; however, it has been suggested that childhood emotional abuse is more strongly related to depression. It remains unclear which underlying psychological processes mediate the effect of childhood emotional abuse on depressive symptoms. In a cross-sectional study in 276 female college students, multiple linear regression analyses were used to determine whether childhood emotional abuse, physical abuse, and sexual abuse were independently associated with depressive symptoms, emotion dysregulation, and interpersonal problems. Subsequently, OLS regression analyses were used to determine whether emotion dysregulation and interpersonal problems mediate the relationship between childhood emotional abuse and depressive symptoms. Of all types of abuse, only emotional abuse was independently associated with depressive symptoms, emotion dysregulation, and interpersonal problems. The effect of childhood emotional abuse on depressive symptoms was mediated by emotion dysregulation and the following domains of interpersonal problems: cold/distant and domineering/controlling. The results of the current study indicate that detection and prevention of childhood emotional abuse deserves attention from Child Protective Services. Finally, interventions that target emotion regulation skills and interpersonal skills may be beneficial in prevention of depression.

# Introduction

Childhood abuse is widely acknowledged as a major public health problem with detrimental effects on adult mental health (i.e., Gilbert et al., 2009; Kessler et al., 2010). Numerous studies have associated childhood abuse with a variety of adverse effects, such as mood and anxiety disorders (Gilbert et al., 2009; Hovens et al., 2010; Kessler, Davis, & Kendler, 1997; Kessler et al., 2010) and suicidal behaviors (Dube et al., 2001; Molnar, Berkman, & Buka, 2001; Mullen, Martin, Anderson, Romans, & Herbison, 1996). In particular, childhood abuse has consistently been linked to depressive disorders in adulthood in both retrospective studies (Braithwaite, O'Connor, Degli-Esposti, Luke, & Bowes, 2017; Hovens et al., 2010) and prospective studies (e.g., Brown, Cohen, Johnson, & Smailes, 1999; Widom, DuMont, & Czaja, 2007).

The vast majority of studies on childhood abuse have focused on the impact of either childhood sexual abuse (CSA) or childhood physical abuse (CPA) (Egeland, 2009), linking both types of abuse to adult depression (Klein et al., 2013; Lansford et al., 2002; Maniglio, 2009a; Springer, Sheridan, Kuo, & Carnes, 2007). However, studies that examined the impact of multiple types of abuse have demonstrated childhood emotional abuse (CEA) to be even more strongly related to depression than CSA and CPA (Gibb, Chelminski, & Zimmerman, 2007; Martins, Baes, de Carvalho Tofoli, & Juruena, 2014; Nelson, Klumparendt, Doebler, & Ehring, 2017; Norman et al., 2012). CEA refers to an aggressive attitude towards a child, which is not physical in nature, and may include verbal assaults on one's sense of worth or wellbeing, or any humiliating or demeaning behavior (Bernstein & Fink, 1998). CEA is far more prevalent than CSA and CPA: recent meta-analyses demonstrated global self-reported prevalence of 127 per 1,000 for CSA (Stoltenborgh et al., 2011), 226 per 1,000 for CPA (Stoltenborgh, Bakermans-Kranenburg, van IJzendoorn, & Alink, 2013), and as high as 363 per 1,000 children for CEA (Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2012).

An important limitation of previous studies on different types of childhood abuse lies in the fact that most did not address the unique impact of each type of childhood abuse, while controlling for the other types. There is substantial overlap and intercorrelation among different types of childhood abuse in community-based samples (Chiu et al., 2013; Finkelhor, Ormrod, & Turner, 2007; Kessler et al., 2010), and this co-occurrence of different types of maltreatment results in a greater likelihood of negative mental health outcomes (Chiu et al., 2013; Finkelhor et al., 2007). Therefore, the unique impact of each type of childhood abuse may be overestimated or distorted by the impact of other types. Hence, it is necessary to examine both the unique and collective impact of all three types of childhood abuse on negative outcomes, while adjusting for the

other types. With regard to CEA, only one study examined its impact with adjustment for CSA and CPA, and found that CEA was significantly associated with depressive symptomatology in women (Spertus, Yehuda, Wong, Halligan, & Seremetis, 2003).

Given the high prevalence of childhood abuse in general, and CEA in particular, it is of utmost importance to examine how they lead to an increased risk of adult depression. Therefore, the main objective of this study is to identify underlying psychological processes that may act as a mediator in this relationship, and may be useful targets for prevention of depression. Several psychological processes have been associated with both general childhood abuse (including CSA, CPA, and CEA) and depression, among which are emotion dysregulation (Hopfinger, Berking, Bockting, & Ebert, 2016) and interpersonal problems (Cicchetti & Toth, 2005).

**Emotion dysregulation**

Recent evidence suggests that emotion dysregulation plays an important role in the relation between childhood abuse and depression (Hopfinger et al., 2016). Emotion regulation refers to "the processes responsible for monitoring, evaluating, and modifying emotional reactions, especially their intensive and temporal features, to accomplish one's goals" (Thompson, 1994). In individuals with current or lifetime major depressive disorder, emotion dysregulation was found to cross-sectionally mediate the relationship between severity of general childhood abuse and depression severity (Hopfinger et al., 2016; Schierholz, Krüger, Barenbrügge, & Ehring, 2016). With regard to CEA, emotion dysregulation cross-sectionally mediated the association between CEA and depressive symptoms in studies among female college students (Coates & Messman-Moore, 2014), depressed inpatients (Schulz et al., 2017), and low-income African-Americans (Crow, Cross, Powers, & Bradley, 2014). The study among college students did not include CSA and CPA, whereas the latter two studies did. For CPA, no evidence was found for a relationship with depression mediated by emotion dysregulation (Crow et al., 2014; Schulz et al., 2017). Regarding CSA, emotion dysregulation mediated the relationship with depression only in the African-American sample (Crow et al., 2014). The adverse effect of childhood abuse on emotion dysregulation was found to be specific for CEA: CEA significantly predicted emotion dysregulation above and beyond the effects of CSA and CPA in female college students (Burns, Jackson, & Harding, 2010). Similarly, in another college sample, CEA exclusively predicted difficulties with responding to and dealing with emotions, but not with recognizing and understanding emotions (Berzenski, 2018). Hence, the mediating role of emotion dysregulation in the relationship with depression may be largely specific to CEA.

Although it should be noted that cross-sectional mediation provides an indication for, but not proof of the presence of an underlying mechanism, these previous findings suggest that emotion dysregulation contributes to the link between CEA and adult depression (Coates & Messman-Moore, 2014; Crow et al., 2014; Schulz et al., 2017). However, assessment of emotion dysregulation was limited in these earlier studies. Schulz et al. (2017) used a specific measure of emotion acceptance (i.e., Emotion Acceptance Questionnaire; Beblo et al., 2011), rather than overall emotion dysregulation. Crow et al. (2014) used a relatively novel measure of emotion dysregulation with only modest evidence on psychometric properties (i.e., the 12-item version of the Emotion Dysregulation Scale; Powers, Stevens, Fani, & Bradley, 2015). Lastly, although Coates and Messman-Moore (2008) used the widely-used Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) to measure emotion regulation, they used a latent factor comprised of only two subscales (i.e., Emotional Clarity and Access to Strategies) – thereby omitting other domains of emotion dysregulation captured by the DERS (e.g., lack of emotional awareness and non-acceptance of emotional responses). Therefore, the current study aims to confirm the mediating role of emotion dysregulation in the relationship between CEA and adult depressive symptoms, utilizing a widely-used measure of overall emotion dysregulation (i.e., DERS) with good psychometric properties.

**Interpersonal problems**

Although research is still scarce, interpersonal problems have been suggested to be an underlying factor of the link between childhood abuse and depression (Liu, 2017). Childhood abuse appears to negatively influence social relationships and interpersonal functioning, which was found for CPA (Mullen et al., 1996), CSA (Huh et al., 2014; Whiffen, Thompson, & Aube, 2000), and CEA (Huh et al., 2014). However, one study in college students found no direct relationship with problems with social relationships for CEA and CPA, whereas CSA was associated with decreased social problems (Berzenski, 2018). Individuals with a history of childhood abuse in general reported lower levels of social support in adulthood (Sperry & Widom, 2013), more dysfunctional relationships, and an increased risk for divorce compared to others (Colman & Widom, 2004). People with a history of childhood abuse have not only reported more difficulties in marital and social relationships than others, but also more interpersonal problems as measured with the widely-used Inventory of Interpersonal Problems (IIP; Horowitz et al., 2000). The IIP measures persistent difficulties that individuals experience in social relationships, and distinguishes different domains of interpersonal problems (e.g., being domineering/controlling, nonassertive, or self-sacrificing) (Horowitz, 2004; Horowitz et al., 2000). Victims of CSA reported more interpersonal difficulties than non-victims on all domains of the IIP (Whiffen et al., 2000). Similarly, in a Korean sample of patients with depression and anxiety disorders, both CEA and CSA, but not CPA, were

associated with interpersonal problems as measured with the IIP total score (Huh et al., 2014). However, an important limitation of these studies lies in the fact that they did not address the unique impact of each type of childhood abuse, controlled for the other types. Therefore, the unique and collective impact of all three types of childhood abuse on interpersonal functioning remains unknown.

Interpersonal problems have not only been linked to childhood abuse, but also to depression. Recurring frustrated interpersonal dynamics may make an individual more vulnerable to depression (Horowitz, 2004). For example, social isolation, avoidance, and submissiveness have been associated with depression (Barrett & Barber, 2007; Santini, Koyanagi, Tyrovolas, Mason, & Haro, 2015). However, it remains unknown whether interpersonal problems mediate the link between CEA and depression, and which specific interpersonal styles as measured with the IIP play a role in this relationship. In the aforementioned study of Whiffen et al. (2000), difficulties with being too controlling, being intimate, and being submissive cross-sectionally and partly mediated the relation between CSA and depression in women. Hence, their results suggest that these interpersonal styles partly account for the risk of depression in women with a history of CSA. Interestingly, different interpersonal styles (i.e., being unassertive and taking too much responsibility) partially mediated this relation in men (Whiffen et al., 2000).

Previous research has reported a gender difference regarding the associations among childhood abuse, interpersonal relationships, and depression as well. A history of childhood abuse negatively influenced women's perceived quality of their romantic relationships, whereas this did not hold for men (Colman & Widom, 2004). Furthermore, emotionally supportive social relationships were shown to be substantially more protective against a depressive disorder for women than for men (Kendler, Myers, & Prescott, 2005). Lastly, the effect of CEA on internalizing symptoms (i.e., peer problems and emotional symptoms) and mental well-being was larger for girls than for boys in a Swedish population sample (Hagborg, Tidefors, & Fahlke, 2017). Hence, although the majority of research found no gender differences regarding the prevalence of CEA (Gilbert et al., 2009; Stoltenborgh et al., 2012), previous findings suggest that its effect on interpersonal functioning, emotion regulation, and depression may be stronger for women compared to men. Therefore, also given women's substantially increased risk to develop a major depressive disorder compared to men (de Graaf, ten Have, van Gool, & van Dorsselaer, 2012), this study is conducted in a female sample.

### Aims

In the current study, our aims were threefold. First, we examined the collective and unique impact of childhood emotional abuse, physical abuse, and sexual abuse on depressive symptoms, emotion dysregulation, and interpersonal problems in a European sample of female college students. Based on current literature (Burns et al., 2010; Spertus et al., 2003), we hypothesized that only emotional abuse would be independently associated with depressive symptoms and emotion dysregulation, if the three types of childhood abuse were controlled for each other. Furthermore, we hypothesized that all three types of childhood abuse would be independently associated with interpersonal problems. Second, if evidence for a relationship between CEA and depression indeed existed, as hypothesized, we aimed to examine whether this relationship would be cross-sectionally mediated by emotion dysregulation and interpersonal problems. We hypothesized that both emotion dysregulation and interpersonal problems would mediate the relationship between CEA and depressive symptoms. Finally, we aimed to explore whether specific domains of interpersonal problems could be identified as particularly important in explaining the relationship between CEA and depressive symptoms.

## Materials and Methods

### Design and procedures

This cross-sectional study was conducted at the VU University in Amsterdam, The Netherlands, in collaboration with the research department of Arkin. The data collection took place in April and May 2017. College students were recruited by research assistants through flyers posted on campus, Facebook, and online research recruitment platforms. All participants provided written informed consent prior to participation. Participants completed a set of self-report questionnaires with forced responses administered in Net-Q: an online secured survey platform. Each assessment was supervised by one of two research assistants (MSc or BSc) and took approximately 45 minutes. Participants were compensated with €10 or 50 minutes course credit.

### Participants

The inclusion criteria were: being female, being currently studying in the Netherlands, and having sufficient understanding of the Dutch language to administer self-report questionnaires. The study sample consisted of 276 female college students with a mean age of 21.7 years (*SD* = 2.38). As shown in Table 1, participants were predominantly born in the Netherlands (91.7%), single (66.3%), living with their parents (42.0%) or with roommates (35.1%), and studying psychology (50.4%).

**Table 1**

Demographic characteristics of the total study sample (*N* = 276)

| | *n* | % |
|---|---|---|
| Country of birth | | |
| Netherlands | 253 | 91.7 |
| Other European country | 12 | 4.3 |
| Non-European country | 11 | 4.0 |
| Country of birth of parents | | |
| Both Netherlands | 192 | 69.6 |
| Both Europe | 21 | 7.6 |
| One Netherlands, one non-European | 19 | 6.9 |
| Both non-European | 44 | 15.9 |
| Relationship status | | |
| Single | 183 | 66.3 |
| In a relationship | 93 | 33.7 |
| Living situation | | |
| With parent(s)/caregiver(s) | 116 | 42.0 |
| With roommates | 97 | 35.1 |
| Alone | 36 | 13.0 |
| With partner | 26 | 9.4 |
| Other | 1 | 0.3 |
| Field of study | | |
| Psychology | 139 | 50.4 |
| Pedagogical and other social sciences | 41 | 14.9 |
| Medicine/health sciences | 24 | 8.7 |
| Management/business/economics | 23 | 8.3 |
| Communication science | 15 | 5.4 |
| Law | 12 | 4.3 |
| Natural/formal sciences | 11 | 4.0 |
| Other | 11 | 4.0 |

## Measures

### *Demographics*

The demographic characteristics age, country of birth, country of birth of parents, relationship status, living situation, and field of study were collected during the self-report assessment.

### *Childhood abuse*

The short form of the Childhood Trauma Questionnaire (CTQ-SF; Bernstein et al., 2003; Thombs et al., 2009) was used to assess severity of CEA (i.e., verbal assaults on one's sense of worth or wellbeing, or any humiliating or demeaning behavior), CPA (i.e., bodily assaults that posed a risk of or resulted in injury), and CSA (i.e., unwanted sexual contact or conduct). Each scale consists of 5 items, rated on a 5-point, Likert-type scale with response options ranging from "Never true" to "Very often true", with the exception of the CSA scale. Previous psychometric analyses of the Dutch version indicated that one item of the CSA scale ("During my youth, I was molested by someone") had to be removed (Thombs et al., 2009). A total score was calculated for each scale by summing all items. The sum score of the CSA scale was multiplied by 5/4 to enable comparisons with other studies using the CTQ-SF. The sum scores of the scales were used as continuous variables to address the main research questions. The CTQ-SF manual provides cut-off scores to describe presence/absence of abuse and levels of abuse severity (none, mild, moderate, severe) for each type of childhood abuse (Bernstein et al., 2003); in the current study, these cut-offs were used for descriptive purposes only. Validity and reliability of the Dutch version of the CTQ-SF are good (Spinhoven et al., 2014; Thombs et al., 2009). In the current study, internal consistency was good for the CEA scale ($\alpha$ = .80), acceptable for the CPA scale ($\alpha$ = .76), and excellent for the CSA scale ($\alpha$ = .91).

### *Depressive symptoms*

Depressive symptoms were measured with the Quick Inventory of Depressive Symptoms (QIDS-SR-16), a 16-item self-rated depression severity scale (Rush et al., 2003). The questionnaire rates the severity of the DSM-IV criteria for depressive disorder (American Psychiatric Association, 2000) in the preceding seven days. Total scores range from 0 to 27. A systematic review of the psychometric properties of the QIDS-SR-16 reported that the internal consistency was acceptable ($\alpha$ = .69 to .89), and concurrent validity with other depression scales was moderate to high (Reilly, MacGillivray, Reid, & Cameron, 2015). In the current study, the internal consistency of the QIDS-SR-16 was acceptable ($\alpha$ = .76).

***Emotion dysregulation***

Emotion dysregulation was measured with the Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004; Neumann et al., 2010). The DERS is a 36-item self-report questionnaire that evaluates emotion regulation difficulties across multiple domains: non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Total scores range from 36 to 180. The DERS showed high internal consistency and good test-retest reliability in a student sample (Gratz & Roemer, 2004). In the current study, the internal consistency of the DERS was excellent ($\alpha$ = .93).

***Interpersonal Problems***

Interpersonal difficulties were measured with the Inventory of Interpersonal Problems (IIP-32): a self-report questionnaire with good internal consistency and test-retest reliability (Horowitz et al., 2000). The IIP-32 consists of 32 items and comprises eight subscales related to different domains of interpersonal problems, which showed acceptable to good internal consistency in the current study: domineering/controlling ($\alpha$ = .68), vindictive/self-centered ($\alpha$ = .78), cold/distant ($\alpha$ = .76), socially inhibited ($\alpha$ = .80), nonassertive ($\alpha$ = .77), overly accommodating ($\alpha$ = .71), self-sacrificing ($\alpha$ = .72), and intrusive/needy ($\alpha$ = .74).

**Ethics**

The study was reviewed and approved by the ethics committee of the VU University, Amsterdam, The Netherlands (VCWE-2017-009R1). Participation in the study was voluntary, and all participants provided written informed consent.

**Statistical analyses**

Data were analyzed using SPSS Statistics 24.0. There were no missing values. First, univariate linear regression analyses were performed to examine associations between the continuous variables CEA, CPA, and CSA, and the outcome variables depressive symptoms (QIDS-SR-16), emotion dysregulation (DERS total score), and interpersonal problems (IIP-32 total score). Subsequently, three multiple linear regression analyses were performed in order to determine which types of childhood abuse were independently associated with these outcome variables. Assumptions for regression analyses (linearity, homoscedasticity, normality of the residuals, absence of multicollinearity) were met.

If there was evidence for an association between CEA and depressive symptoms, we proceeded with conducting mediation analyses. To test the potential mediation

effects of emotion dysregulation (DERS total score) and interpersonal problems (IIP-32 total score), we performed two simple mediation analyses using the PROCESS macro (Hayes, 2013) for SPSS, which is based on OLS regression analysis. Rijnhart, Twisk, Chinapaw, de Boer, and Heymans (2017) demonstrated that when analyzing simple mediation models with a continuous mediator and continuous outcome variable, OLS regression yields the same results as SEM and the potential outcomes framework. Finally, to explore whether specific domains of interpersonal problems could be identified as particularly important in explaining the relationship between CEA and depressive symptoms, we performed a multiple mediation analysis including all eight IIP-32 subscales as mediator variables. The presence and magnitude of mediation was determined by estimating the indirect effects. To test the statistical significance of the indirect effects, we used bias-corrected 95% bootstrap confidence intervals (based on 5000 bootstrap samples) as calculated by PROCESS (Hayes, 2013). If zero was not contained in the confidence interval, we concluded that the indirect effect was significant. To measure the mediation effect size, we used $P_M$: the proportion of each indirect effect relative to the total effect. An alpha level of .05 and confidence interval of 95% were used in all analyses.

# Results

**Descriptive statistics**

The severity levels for each type of childhood abuse are shown in Table 2. Using the lowest CTQ-SF cut-off scores, we found that 31.5% of the participants reported CEA, 8.0% reported CPA, and 11.6% reported CSA. Descriptive statistics of the self-report measures of severity of childhood abuse, depressive symptoms, emotion dysregulation, and interpersonal problems are presented in Table 3. The CTQ-SF subscales showed considerable correlations. The highest correlation was found between CEA and CPA (Pearson $r = .49$), whereas lower correlations were found between CEA and CSA (Pearson $r = .37$), and CPA and CSA (Pearson $r = .27$). Using the QIDS-SR scoring guidelines, 59.8% of the participants reported no depressive symptoms (score 0-5), 30.1% reported mild depressive symptoms (score 6-10), 8.0% reported moderate depressive symptoms (score 11-15), and 2.1% reported (very) severe depressive symptoms (score 16+) (Rush et al., 2003). The highest IIP-32 subscale scores were found for the domains overly accommodating, self-sacrificing, and nonassertive, whereas the lowest subscale scores were found for vindictive/self-centered, cold/distant, and domineering/controlling. This is in accordance with the female norm group described in the IIP manual (Horowitz et al., 2000).

**Table 2**

Severity levels of three types of childhood abuse in female college students (*N* = 276)

| Severity level (CTQ-score) | *n* | % |
|---|---|---|
| CEA | | |
| None (5-8) | 189 | 68.5 |
| Mild (9-12) | 57 | 20.7 |
| Moderate (13-15) | 19 | 6.9 |
| Severe (16+) | 11 | 4.0 |
| CPA | | |
| None (5-7) | 254 | 92.0 |
| Mild (8-9) | 9 | 3.3 |
| Moderate (10-12) | 9 | 3.3 |
| Severe (13+) | 4 | 1.4 |
| CSA | | |
| None (5) | 244 | 88.4 |
| Mild (6-7) | 13 | 4.7 |
| Moderate (8-12) | 10 | 3.6 |
| Severe (13+) | 9 | 3.3 |

*Note.* CEA = childhood emotional abuse; CPA = childhood physical abuse; CSA = childhood sexual abuse; CTQ = Childhood Trauma Questionnaire.

**Table 3**

Descriptive statistics of the self-report measures of severity of childhood abuse, depressive symptoms, emotion dysregulation, and interpersonal problems in female college students (*N* = 276)

| | *M* | *SD* | Range |
|---|---|---|---|
| Childhood emotional abuse (CTQ-CEA) | 7.8 | 3.4 | 5-22 |
| Childhood physical abuse (CTQ-CPA) | 5.7 | 1.8 | 5-18 |
| Childhood sexual abuse (CTQ-CSA) | 5.7 | 2.6 | 5-21 |
| Depressive symptoms (QIDS-SR) | 5.4 | 4.0 | 0-22 |
| Emotion dysregulation (DERS) | 84.9 | 19.9 | 44-139 |
| Interpersonal problems (IIP-32 total) | 34.6 | 13.9 | 3-78 |
| Vindictive/self-centered (IIP-32 subscale) | 2.4 | 2.5 | 0-15 |
| Cold/distant (IIP-32 subscale) | 2.6 | 2.6 | 0-11 |
| Socially inhibited (IIP-32 subscale) | 3.6 | 3.1 | 0-14 |
| Nonassertive (IIP-32 subscale) | 5.5 | 3.3 | 0-16 |
| Overly accommodating (IIP-32 subscale) | 6.6 | 3.4 | 0-16 |
| Self-sacrificing (IIP-32 subscale) | 6.6 | 3.2 | 0-15 |
| Intrusive/needy (IIP-32 subscale) | 4.3 | 3.1 | 0-15 |
| Domineering/controlling (IIP-32 subscale) | 3.0 | 2.6 | 0-13 |

*Note.* CEA = childhood emotional abuse; CPA = childhood physical abuse; CSA = childhood sexual abuse; CTQ = Childhood Trauma Questionnaire; DERS = Difficulties in Emotion Regulation Scale; IIP-32 = Inventory of Interpersonal problems-32; M = mean; SD = standard deviation; QIDS-SR = Quick Inventory of Depressive Symptomatology-Self Report.

**Univariate linear regression analyses**

Table 4 provides the results of the univariate linear regression analyses for examining the association between three types of childhood abuse and depressive symptoms, emotion dysregulation, and interpersonal problems. CEA was significantly associated with depressive symptoms ($b$ = 0.38, $t$ = 5.72, $p$ < .001, $R^2$ = .11), emotion dysregulation ($b$ = 1.14, $t$ = 3.33, $p$ = .001, $R^2$ = .04), and interpersonal problems ($b$ = 1.13, $t$ = 4.81, $p$ < .001, $R^2$ = .08). CPA was significantly associated with depressive symptoms ($b$ = 0.33, $t$ = 2.45, $p$ = .015, $R^2$ = .02) and interpersonal problems ($b$ = 1.23, $t$ = 2.66, $p$ = .008, $R^2$ = .03). No other significant associations between types of childhood abuse and outcome variables existed.

**Table 4**

Results of univariate linear regression analyses for predicting depressive symptoms, emotion dysregulation, and interpersonal problems in female college students (*N* = 276)

| | QIDS-SR | | | DERS | | | IIP-32 | | |
|---|---|---|---|---|---|---|---|---|---|
| | B | (SE) | *p* | B | (SE) | *p* | B | (SE) | *p* |
| CEA | 0.38 | (0.07) | **<.001** | 1.14 | (0.34) | **.001** | 1.13 | (0.24) | **<.001** |
| CPA | 0.33 | (0.13) | **.015** | 0.80 | (0.67) | .235 | 1.23 | (0.46) | **.008** |
| CSA | 0.09 | (0.09) | .338 | 0.21 | (0.46) | .640 | 0.49 | (0.32) | .128 |

*Note.* P-values indicating significance at the .05 level are shown in bold. CEA = childhood emotional abuse; CPA = childhood physical abuse; CSA = childhood sexual abuse; DERS = Difficulties in Emotion Regulation Scale; IIP-32 = Inventory of Interpersonal Problems-32; SE = standard error; QIDS-SR = Quick Inventory of Depressive Symptomatology-Self-Report.

### Multivariate linear regression analyses

The multiple linear regression analyses revealed significant overall models for depressive symptoms ($F(3,272) = 11.34$, $p < .001$, $R^2 = .11$), emotion dysregulation ($F(3,272) = 3.96$, $p = .009$, $R^2 = .04$), and interpersonal problems ($F(3,272) = 7.73$, $p < .001$, $R^2 = .08$). All variance inflation factors (VIFs) were less than 1.5, indicating that multicollinearity was not present. As shown in Table 5, emotional abuse was the only form of childhood abuse that was independently associated with depressive symptoms, with emotion dysregulation, and with interpersonal problems.

**Table 5**

Results of multiple linear regression analyses for predicting depressive symptoms, emotion dysregulation, and interpersonal problems in female college students (*N* = 276)

| | QIDS-SR | | | DERS | | | IIP-32 | | |
|---|---|---|---|---|---|---|---|---|---|
| | B | [95% CI] | *p* | B | [95% CI] | *p* | B | [95% CI] | *p* |
| CEA | 0.42 | [0.26, 0.57] | **<.001** | 1.33 | [0.52-2.14] | **.001** | 1.09 | [0.54-1.65] | **<.001** |
| CPA | -0.03 | [-0.32, 0.27] | .866 | -0.32 | [-1.82-1.19] | .681 | 0.23 | [-0.80-1.26] | .662 |
| CSA | -0.11 | [-0.29, 0.08] | .254 | -0.37 | [1.32-0.59] | .452 | -0.08 | [-0.74-0.58] | .809 |

*Note.* P-values indicating significance at the .05 level are shown in bold. CEA = childhood emotional abuse; CI = confidence interval; CPA = childhood physical abuse; CSA = childhood sexual abuse; DERS = Difficulties in Emotion Regulation Scale; IIP-32 = Inventory of Interpersonal Problems-32; QIDS-SR = Quick Inventory of Depressive Symptomatology-Self-Report.

### Mediation analyses

Emotion dysregulation significantly mediated the effect of CEA on depressive symptoms in a simple mediation model, as displayed in Figure 1. The indirect effect (*b* = 0.13) explained 34% of the total effect (*b* = 0.38). Additionally, interpersonal problems significantly mediated the effect of CEA on depressive symptoms in a separate simple mediation model, as displayed in Figure 2. The indirect effect (*b* = 0.12) explained 31% of the total effect (*b* = 0.38).

**Figure 1.** Model of childhood emotional abuse as a predictor of depressive symptoms, mediated by emotion dysregulation.

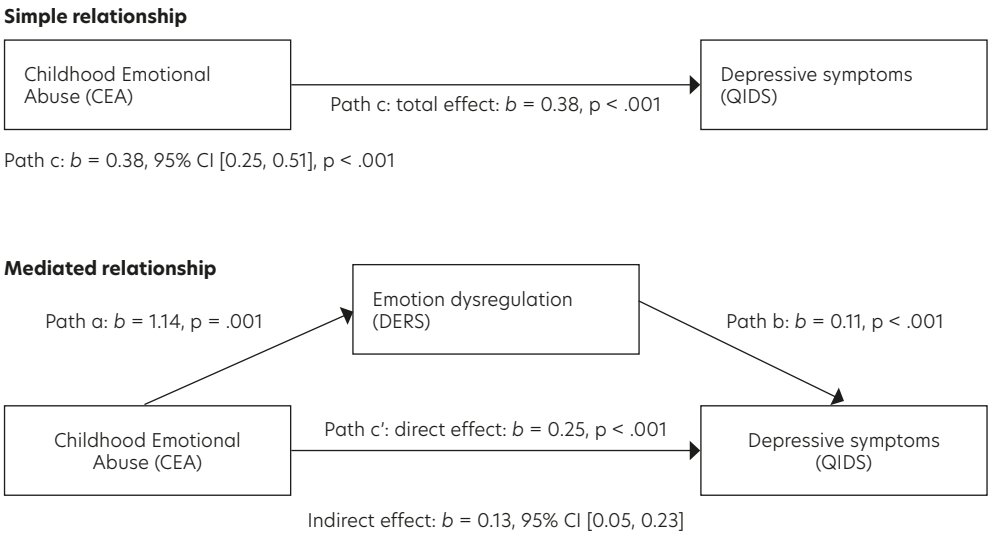


**Figure 2.** Model of childhood emotional abuse as a predictor of depressive symptoms, mediated by interpersonal problems.

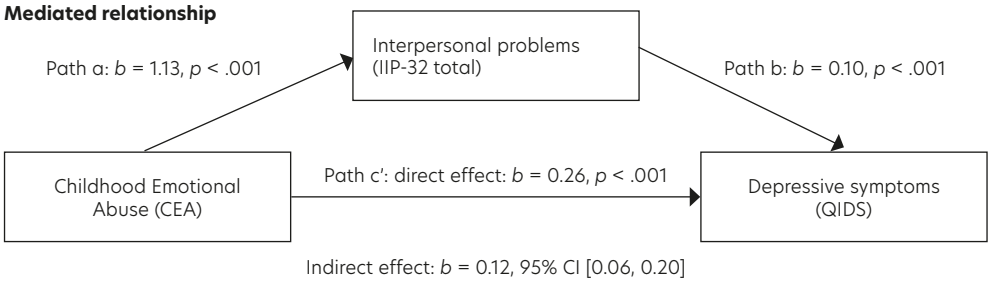

Table 6 provides the results of the multiple mediation analysis for the eight domains of interpersonal problems. The effect of CEA on depressive symptoms was significantly mediated by the following domains of interpersonal problems: cold/distant (proportion mediated: 9%) and domineering/controlling (proportion mediated: 14%). Although the domain self-sacrificing was significantly associated with depressive symptoms, it was not significantly associated with CEA.

**Table 6**

Results of multiple mediation analysis for testing all eight domains of interpersonal problems as mediators of the effect of childhood emotional abuse on depressive symptoms in female college students (*N* = 276)

| Mediators (M) | b of CEA → M (path a) | b of M → QIDS (path b) | b of indirect effect (a x b) [95% CI] | | $P_M$: proportion of indirect effect of total effect [95% CI] | |
|---|---|---|---|---|---|---|
| Vindictive/self-centered | 0.12** | -0.05 | -0.01 | [-0.04, 0.02] | -0.02 | [-0.12, 0.05] |
| Cold/distant | 0.15** | 0.23* | 0.03[a] | [0.01, 0.08] | 0.09 | [0.01, 0.23] |
| Socially inhibited | 0.19*** | 0.10 | 0.02 | [-0.02, -0.08] | 0.05 | [-0.05, 0.21] |
| Nonassertive | 0.12* | 0.12 | 0.01 | [-0.01, 0.07] | 0.04 | [-0.02, 0.17] |
| Overly accommodating | 0.11 | 0.07 | 0.01 | [-0.02, 0.05] | 0.02 | [-0.05, 0.14] |
| Self-sacrificing | 0.11 | 0.19* | 0.02 | [-0.00, 0.07] | 0.05 | [-0.00, 0.18] |
| Intrusive/needy | 0.15** | -0.09 | -0.01 | [-0.05, 0.01] | -0.04 | [-0.15, 0.02] |
| Domineering/controlling | 0.18*** | 0.28** | 0.05[a] | [0.01, 0.12] | 0.14 | [0.03, 0.33] |

*Note.* CEA = childhood emotional abuse; CI = confidence interval; QIDS-SR = Quick Inventory of Depressive Symptomatology-Self-Report.
[a] = significant at the .05 level: 95% bias-corrected bootstrap confidence interval did not contain zero.
* p < .05; ** p < .01; *** p < .001.

# Discussion

The first aim of this study was to examine whether CEA, CPA, and CSA are independently associated with depressive symptoms, emotion dysregulation, and interpersonal problems in female college students. As hypothesized, CEA was independently associated with depressive symptoms and emotion dysregulation, whereas CPA and CSA were not. These results are consistent with previous studies that found CEA to be more strongly related to depression than CSA and CPA (Gibb et al., 2007; Martins et al., 2014; Nelson et al., 2017; Norman et al., 2012; Spertus et al., 2003; Widom et al., 2007). In addition, these findings are in line with research demonstrating that CEA significantly predicted emotion dysregulation above and beyond the effects of CSA and CPA in female college students (Burns et al., 2010) and inpatients with substance use disorders (Banducci, Hoffman, Lejuez, & Koenen, 2014). An explanation for this consistently reported result may be found in children's development of emotion regulation skills, which is highly influenced by the family emotional climate and interactions with primary caregivers (Morris, Silk, Steinberg, Myers, & Robinson, 2007; Thompson, 2014). A child's emotion regulation capabilities can be undermined by parents' denigrating or dismissive behaviors and frequent negative emotions directed at the child (Eisenberg & Morris, 2002; Thompson, 2014). These patterns appear to be most exemplary for CEA, as opposed to CPA and CSA. Moreover, children are assumed to imitate their parents' modes of emotion regulation. Poor emotion regulation modeling by primary caregivers in the form of CEA may lead to emotion regulation deficits in children (Bariola, Gullone, & Hughes, 2011).

Contrary to our expectations, only CEA was independently associated with interpersonal problems – although CPA was significantly associated with interpersonal problems at the univariate level. These findings are inconsistent with previous studies that demonstrated CSA to be associated with interpersonal problems (Huh et al., 2014; Whiffen et al., 2000). However, no previous study has examined multiple types of childhood abuse in one model, thereby examining the unique impact of each type, while adjusting for the other types. Our results suggest that only CEA contributes to interpersonal problems above and beyond the impact of CSA and CPA. CEA involves humiliating, demeaning behavior and verbal assaults on one's sense of worth or well-being (Bernstein et al., 2003), which, together with the often more chronic character of CEA compared to CPA and CSA, are likely to influence one's attitudes and behavior towards others.

Additionally, we aimed to examine whether the relationship between CEA and depressive symptoms is mediated by emotion dysregulation and interpersonal problems. As

hypothesized, we found that both emotion dysregulation and interpersonal problems mediated this relationship. With regard to emotion dysregulation, this finding is consistent with previous research in samples of female college students (Coates & Messman-Moore, 2014), low-income African-Americans (Crow et al., 2014), and depressed inpatients (Schulz et al., 2017). The current study adds to the literature by confirming the mediating role of emotion dysregulation in the association between CEA and depressive symptoms in a European sample of female college students, and by using a widely-used measure of overall emotion dysregulation with good psychometric properties.

With regard to interpersonal problems, our study is the first to identify interpersonal problems as a mediator of the association between CEA and depressive symptoms. This study extends previous research that associated CEA with interpersonal problems (Huh et al., 2014). Possibly, individuals who report a higher level of interpersonal problems experience less social support. It has consistently been shown that social support and larger, diverse social networks are protective against depression in the general population (Gariepy, Honkaniemi, & Quesnel-Vallee, 2016; Santini et al., 2015), especially in women (Kendler et al., 2005). Importantly, perceived social support, rather than received social support plays an important protective role against depression in the general population (see Santini et al., 2015, for a review). Correspondingly, in patients with depressive and anxiety disorders, perceived social disability, rather than loneliness or a low level of social activities, predicted persistence of these disorders at 2-year follow-up (Saris, Aghajani, van der Werff, van der Wee, & Penninx, 2017).

Our final aim was to explore whether specific domains of interpersonal problems could be identified as particularly important in explaining the relationship between CEA and depressive symptoms. We found that this relationship was mediated by cold/distant and domineering/controlling interpersonal styles. Cold/distant individuals do not feel close to or loving toward others, and find it hard to make and maintain long-term commitments to other people (Horowitz et al., 2000). Children suffering from emotional abuse by attachment figures may develop negative internal working models of the self and others that interfere with social functioning as the child matures, and can lead to interpersonal avoidance and a lack of trust in others (Bowlby, 1973; Riggs, 2010) – possibly reflecting a cold/distant interpersonal style. Avoidance of social situations and being cold/distant can in turn lead to depression (Barrett & Barber, 2007; Manes et al., 2016).

Domineering/controlling individuals describe themselves as too controlling or manipulative, and attempt to influence others by arguing excessively and sometimes

showing hostile or aggressive behavior (Horowitz et al., 2000). Our findings are in line with (Huh et al., 2014), who reported that CEA is associated with being more domineering/controlling in a sample of adult outpatients with depression and anxiety disorders. To the best of our knowledge, no previous study reported an association between domineering/controlling behavior as measured with the Inventory of Interpersonal Problems (IIP; Horowitz et al., 2000) and depressive symptoms. However, Barrett and Barber (2007) compared interpersonal profiles of adults with major depressive disorder with the IIP-normative sample, and found no significant differences between these groups on the subscale domineering/controlling. Future prospective studies are needed to examine whether domineering/controlling behavior stems from CEA, and to what extent this type of interpersonal problems may cause a higher risk of depression.

**Strengths and limitations**

The current study has several strengths. This study is the first to explore the mediating role of interpersonal problems in the association between CEA and depressive symptoms. In addition, this study is the first to confirm previous research indicating emotion dysregulation to be a mediator in the association between CEA and depressive symptoms in a European sample of college students, using well-validated measures. Furthermore, we determined the unique and collective impact of three types of childhood abuse in multiple regression models, whereas the majority of previous studies only addressed a single type of childhood abuse.

This study also has some limitations. First, since this is a cross-sectional study, we cannot draw firm conclusions on causality – therefore, our results should be interpreted with caution. Longitudinal research is needed to confirm that emotion dysregulation and interpersonal functioning prospectively mediate the effect of CEA on depression and do indeed represent causal mechanisms. Second, the study relied exclusively on self-report measures; however, all measures have good psychometric properties and are widely-used. The DERS is based on a clinical-contextual model of emotion regulation (Gratz & Roemer, 2004), which has been embraced within applied clinical research, but differs from the more narrow conceptualization of emotion regulation in studies in the field of affective science (e.g. Gross, 1998), which focus on the process of regulating emotions without including broader trait-like abilities such as clarity and self-control. With regard to the Childhood Trauma Questionnaire, both the full scale and subscales were demonstrated to remain stable after 6 months of treatment despite significantly reduced psychopathology (Paivio, 2001). Third, the prevalence of CPA ($n$ = 22, 8.0%) and CSA ($n$ = 34, 13.0%) was relatively low, which may limit the statistical power to detect possible weak associations between these types of abuse and the outcome variables. Fourth, the generalizability of our results may be limited, since our sample

consisted of well-educated, young adult women. However, the association between childhood maltreatment and adult depression did not differ between men and women in a large sample of patients (Arnow, Blasey, Hunkeler, Lee, & Hayward, 2011). Lastly, as the majority of our non-clinical sample reported none to mild depressive symptoms, results are not generalizable to depressed patients. However, well-educated, young adult women are an important high-risk group for developing a depression (de Graaf et al., 2012; de Graaf, van Dorsselaer, Tuithof, & ten Have, 2013). A recent survey of the WHO World Mental Health International College Student project among 8 countries demonstrated depressive disorder to be the most common mental disorder in first-year college students, with a 12-month prevalence of 18.5% (Auerbach et al., 2018). Importantly, female college students were at increased risk for both lifetime and 12-month mental disorders compared to male students (Auerbach et al., 2018).

**Recommendations**

Our findings indicate that both emotion dysregulation and specific types of interpersonal problems play an important role in the relationship between CEA and depression in female college students. Future studies should examine the collective and unique impact of different types of childhood abuse on specific types of interpersonal problems in diverse samples, such as lower educated samples, different age groups, males, and clinical samples of patients with mental disorders. Furthermore, our findings should be replicated in prospective studies that are able to examine whether emotion dysregulation and interpersonal problems temporally precede the emergence of depressive symptoms. In addition, future studies should further examine the relation between interpersonal problems and depression, and the potential role of social support in this relationship.

The current study indicates that detecting and preventing CEA deserves as much attention from Child Protective Services as CPA and CSA. If emotion dysregulation and specific types of interpersonal problems are replicated in future studies as crucial links between CEA and depressive symptoms, prevention programs that target these specific, underdeveloped skills in children and adults with a history of CEA may be beneficial in primary prevention of depression. Furthermore, clinicians should recognize and acknowledge the harmful impact of CEA in treatment of depressed individuals. Incorporating treatment techniques aimed at strengthening emotion regulation and interpersonal skills (e.g., Berking, 2008; Christ et al., 2018) may enhance treatment outcome and reduce the risk of relapse in depressed patients with a history of CEA.

# Part IV

# Conclusions

# Chapter 10

## Summary, discussion, and recommendations

# Summary of main findings

**Part I: Victimization and offending in dual diagnosis patients**

In **chapter 2**, we concluded that dual diagnosis patients are more likely to be victims of crime compared to the general population of Amsterdam. Disturbingly, in our sample of 243 dual diagnosis patients, 60% reported violent victimization and 58% reported property victimization in the 12 months prior to the assessment. More specifically, dual diagnosis patients were 14.8 times more likely to have been a victim of physical abuse, 5.8 times more likely to have been a victim of sexual assault, and 2.0 times more likely to have been a victim of a property crime, in comparison with the general population. In **chapter 3**, we demonstrated that male patients with dual diagnosis were most often physically abused by a stranger in a public area, whereas female patients were most frequently physically abused by an (ex)partner in their own home. Furthermore, we concluded that sexual assault victimization was more prevalent in female patients compared to male patients. We indicated that dual diagnosis patients were unlikely to report physical and sexual victimization to the police. Men were even more unlikely to report physical victimization to the police (8.5%) compared to women (29.4%). Most frequently reported reasons for not reporting to the police were the belief that the police could or would not do anything to help, and fear of reprisal or getting the offender in trouble. The minority of dual diagnosis patients spoke to caregivers about their most recent incident of physical abuse (29.0%) and sexual abuse (37.0%).

In **chapter 4**, we showed that in the subgroup of male dual diagnosis patients, younger patients were at higher risk of both violent and property victimization. Furthermore, violent victimization was independently associated with a self-sacrificing, overly accommodating interpersonal style in males. In female dual diagnosis patients, violent victimization was independently associated with homelessness and with a domineering/controlling interpersonal style, whereas a socially inhibited and cold/distant interpersonal style was protective against violent victimization. In both male and female patients, both violent and property victimization were independently associated with offending. In **chapter 5**, we demonstrated that the majority of our sample (51.9%) reported perpetration of at least one offense in a timeframe of one year. More specifically, 23.5% reported violent offending (physical and/or sexual assault), 27.6% reported having threatened others, and 28.0% reported property crime perpetration. Violent offending was independently associated with younger age, severity of alcohol use problems, higher manic/disorganization symptoms, and lifetime trauma exposure. Making verbal threats of violence was independently associated with severity of alcohol use problems and higher manic/disorganization symptoms. Property crime perpetration was independently associated with severity of alcohol and drug use problems.

**Part II: The SOS training to prevent victimization in dual diagnosis patients**
The study protocol of our single-blind randomized controlled trial (RCT) is described in **chapter 6**. We introduced the Self-wise, Other-wise, Streetwise (SOS) training: a newly developed 12 session group-based skills training, focused on improving emotion regulation skills, conflict resolution skills, and street skills in dual diagnosis patients. The primary aim of the RCT was to investigate whether the addition of SOS training to care as usual would result in a larger reduction of victimization compared to care as usual alone. We described that victimization would be measured with the Safety Monitor, and that the primary outcome measure of the study would be treatment response for total victimization (yes/no), with 'yes' defined as either reporting no past-year victimization at 14-month follow-up, or at least a 50% reduction in the number of past-year victimization incidents at 14-month follow-up compared to the year prior to baseline. Secondary, we aimed to examine whether adding SOS training to care as usual would result in a larger improvement on secondary outcome measures, with the key secondary outcome measures being: violent victimization, property victimization, substance use, psychiatric symptom severity, and emotion dysregulation. Finally, we described that we would conduct an economic evaluation alongside the RCT.

In **chapter 7** we reported the key findings of our RCT. We demonstrated that significantly more participants who were randomized to receive SOS training as add-on to usual care achieved treatment response on the primary outcome measure total victimization compared to those who received usual care alone. Results for treatment response for violent victimization were inconclusive as to whether a difference was present between groups. There were no significant group differences in treatment response for property victimization. No significant overall or time-specific intervention effects were found for alcohol use problems, drug use problems, or psychiatric symptom severity. We concluded that the SOS training can be implemented in addiction-psychiatry services to effectively contribute to victimization prevention in dual diagnosis patients.

**Part III: Victimization in female college students**
In **chapter 8** we hypothesized that sexual victimization history would be associated with emotion regulation difficulties and impaired risk perception in a sample of 276 female college students. We demonstrated that 40% of the women in our sample reported lifetime sexual victimization, 14% reported past-year sexual victimization, and 12% reported childhood sexual abuse. We reported that we did not find evidence for any of the expected relationships between sexual victimization, risk perception, and emotion regulation difficulties. In **chapter 9** we demonstrated that childhood emotional abuse was independently associated with depressive symptoms, emotion dysregulation, and interpersonal problems. Additionally, we reported that the relationship between

childhood emotional abuse and depressive symptoms was cross-sectionally mediated by emotion dysregulation and the following domains of interpersonal problems: cold/distant and domineering/controlling.

# General discussion and directions for future research

**The prevalence of violent victimization in dual diagnosis patients**

A large body of research has demonstrated that both patients with severe mental illness (Maniglio, 2009b) and patients with substance use disorders (Stevens et al., 2007; Vaughn et al., 2010) are at increased risk of violent victimization. We showed that patients suffering from co-occurring substance use disorders and other mental disorders are at an alarmingly higher risk of violent victimization compared to the general population (chapter 2). Although we did not make a direct comparison to other patient groups, our findings suggest that violent victimization rates of patients with dual diagnosis are even higher compared to those with pure disorders. This is in line with a study by Sells et al. (2003), that compared violent victimization rates across diagnostic groups and found that those with co-occurring disorders had experienced significantly more violent victimization than those with a psychiatric disorder alone or a substance use disorder alone. As risk of victimization has been associated with substance use in patients with severe mental illness, and with psychiatric distress in patients with substance use disorders, an increased victimization risk of dual diagnosis patients is not surprising. However, studies in the dual diagnosis population are scarce. To the best of our knowledge, the study by Sells et al. (2003) has been the only other study examining victimization in dual diagnosis patients, apart from the current thesis. Large epidemiologic studies should include an assessment of victimization to gain more insight in the prevalence of victimization in patients with mental disorders and enable direct comparisons between diagnostic groups.

**Towards a better understanding of violent victimization: the importance of examining gender differences**

We demonstrated that violent victimization experiences of dual diagnosis patients encompass a wide variety of locations and perpetrators (chapter 3), which is largely in line with three studies among individuals with mental disorders (Bengtsson-Tops & Ehliasson, 2012; Katsikidou et al., 2013; Meijwaard et al., 2015). Although victimization rates were considerably high in both men and women, female gender was a risk factor for violent victimization (chapter 4), particularly for sexual abuse (chapter 3). Interestingly, our findings suggest that violent victimization manifests itself somewhat

differently in men and women with dual diagnosis, with regard to its characteristics and associated factors (chapter 3 and 4). In both psychological and biomedical research, gender differences are often not included in study design and analysis (e.g. Rich-Edwards, Kaiser, Chen, Manson, & Goldstein, 2018; Ritchie, 2009; Ruiz-Cantero et al., 2007). Hence, findings based on the study of only one sex may be mistakenly generalized and applied to both. Future studies assessing victimization should take gender differences into account, as this can increase the rigor and expand the relevance of the research.

Males mainly reported physical abuse by strangers and acquaintances (e.g. friends of friends, drug dealers), in public (chapter 3). In males, violent victimization was independently associated with a self-sacrificing, overly accommodating interpersonal style (chapter 4). Individuals with this interpersonal style overaccommodate to the needs and wants of others and sacrifice their own desires, describing themselves as too forgiving and trusting, submissive, and easily taken advantage of (Horowitz et al., 2000). Although this type of interpersonal problems in adulthood has been related to childhood physical abuse in males (Paradis & Boucher, 2010), there are no previous studies that have linked this type of interpersonal problems to adult victimization. From a routine activity theory perspective, delineated in the introduction of this thesis, one could theorize that individuals who are too trusting, submissive, and easily taken advantage of are at increased risk of violent victimization because they may be suitable targets for motivated offenders (Cohen & Felson, 1979).

In females, violent victimization was independently associated with homelessness (chapter 4). Previous studies have shown that homeless women are particularly prone to become victims of sexual violence (de Oliveira et al., 2012; Padgett & Struening, 1992); and that homeless women are at greater risk for violent victimization compared to homeless men (see Roy et al., 2014, for a review). Homelessness may lead to greater exposure to dangerous situations and thereby increase vulnerability for violent victimization. However, homelessness can also be a result of violent victimization, for instance due to conflicts with household members (Browne & Bassuk, 1997). Additionally, in women, a domineering/controlling interpersonal style was independently associated with violent victimization, whereas a socially avoidant interpersonal style was protective against violent victimization. Individuals with a domineering/controlling interpersonal style describe themselves as manipulative and aggressive towards others and find it difficult to relax control over people (Horowitz et al., 2000). Our findings are consistent with a previous study in a sample of psychiatric outpatients, demonstrating that higher levels of aggression and hostility were positively associated with risk of violent victimization, whereas that higher levels of interpersonal sensitivity

were protective against violent victimization (Stepp et al., 2012). Although this study did not examine gender differences, the majority of their sample consisted of female patients who suffered from a personality disorder. Domineering/controlling individuals may lack the social skills to successfully settle disagreements and may be more likely to engage in intimate relationships characterized by hostile, controlling, and potentially violent interactions (Murphy & Blumenthal, 2000). Contrarily, individuals with a socially avoidant interpersonal style may seek less interaction with individuals who are prone to engage in violent behavior.

Future prospective studies should further examine determinants and characteristics of violent victimization in a dual diagnosis samples in both rural and urban environments and across different cross-cultural contexts. This can offer more insight into underlying mechanisms and may result in suggestions for more tailored interventions to suit subgroups of patients with different vulnerabilities.

**The overlap between violent victimization and violent offending**

In both male and female dual diagnosis patients, violent victimization was associated with violent offending (chapter 4). This *victim-offender overlap* has been observed across a broad range of study samples, including patients with substance use disorders (Neale et al., 2005; Stevens et al., 2007) and patients with severe mental illness (Johnson et al., 2016; Maniglio, 2009b). Although causality cannot be derived from our study, the nature of the relationship between victimization and offending is probably multifaceted. Violent victimization can lead directly to violent offending and vice versa, for instance when violence committed by victims is motivated by self-defense or seeking revenge (Friedman et al., 2011). Moreover, other factors (e.g. substance use) can contribute to the risk of both violent victimization and violent offending. Although violent offending among patients with mental illness has been studied extensively compared to victimization, studies on offending in the dual diagnosis population are scarce. In our sample, perpetration of a (physical or sexual) violent assault was independently associated with younger age, more severe alcohol use problems, higher manic/disorganization symptoms, and lifetime trauma exposure (chapter 5). These results are largely consistent with previous findings in patients with mental disorders (e.g. Peterson et al., 2014; Witt et al., 2013). In the current study, lifetime trauma exposure consisted of having experienced or witnessed a traumatic event such as physical violence, sexual assault, threats, a severe accident, disaster, or war. Unfortunately, we have not examined the nature, extent, and timing of the reported experiences, and thus were unable to differentiate between childhood and adult trauma exposure, and potential different types of abuse or other adversities. Research in the general population suggests that a history of childhood abuse may be

a shared risk factor for both adult revictimization (e.g. Christ et al., 2019; Roodman & Clum, 2001) and criminal offending (e.g. Smith & Thornberry, 1995; Widom & Maxfield, 1996). Future research examining violence in the dual diagnosis population should take childhood adversities into account.

As most research examining violence in adults with mental disorders has typically focused on either perpetration or victimization, their considerable overlap merits further investigation. A study by Johnson, Desmarais, Van Dorn, and Grimm (2015) explored participant characteristics in a large sample of adults with severe mental illness, differentiating four categories of violence involvement: non-victim/non-perpetrators, victims only, perpetrators only, and victim-perpetrators. Interestingly, their findings indicated that those with a primary diagnosis of substance use disorder were the only diagnostic group that was most likely to be categorized as victim-perpetrators. Future research should address the victim-offender overlap more thoroughly in the dual diagnosis population. As roles have shown to change over time, a longitudinal design would be preferable to enable assessment of the effects of psychiatric symptoms, substance use, childhood adversities, interpersonal problems, and other relevant participant characteristics on transitions between classifications over time (e.g. Johnson et al., 2016). Intervention needs may differ for individuals who are regularly involved in both victimization and crime perpetration, compared to victims-only.

**Property crime**

In chapter 4 we demonstrated that for property crimes, a victim-offender overlap is also present. This overlap also exists in the Dutch general population (Wittebrood & Nieuwbeerta, 1999). Property crime perpetration was independently associated with severity of alcohol and drug use problems (chapter 5). The literature suggest that people who use substances are more likely to commit property crimes than those who do not, motivated by obtaining money to support their drug use (Bennett et al., 2008). The lifestyle or routine activities of dual diagnosis patients who commit property crimes may make them more likely to be victimized themselves. To obtain illegal drugs, users must enter the world of drug trade, where a variety of transaction-related crimes occur, such as theft from drug dealers, theft from users who did not pay their debts and resolution of disputes over low-quality drugs (Traverso & Bagnoli, 2001). In the current study, the examination of variables associated with property victimization yielded a considerably lower explained variance compared to the violent victimization model (14% and 56% respectively; chapter 4). This indicates that other determinants, that were not included in our study, may be important in explaining property victimization in dual diagnosis patients. Unfortunately, the prevalence and correlates of property victimization have seldom been addressed in previous studies in people with mental

disorders. Future victimization studies should address characteristics and correlates of property victimization in more detail to better understand the mechanisms contributing to patients' increased risk to become victims of theft.

**Victimization prevention among dual diagnosis patients**

The Self-wise, Other-wise, Streetwise (SOS) training was developed to reduce the risk of victimization in dual diagnosis patients (chapter 6 and 7). As outlined in the introduction of this thesis, the routine activity theory states that crimes are likely to occur when three elements are present: a motivated offender, an attractive target and the absence of capable guardianship (Cohen & Felson, 1979). The SOS training aims to reduce patients' attractiveness as a target, by targeting potential underlying vulnerabilities, namely, emotion regulation skills, conflict resolution skills, and street skills (chapter 6). A randomized controlled trial was conducted to evaluate the effectiveness of the SOS training as add-on to usual care. In chapter 7 we demonstrated that adding the SOS training to usual care was more effective in preventing victimization compared to usual care alone. This finding indicates that providing dual diagnosis patients with a relatively brief skills training can lead to considerable improvements. We did not find evidence for overall or time-specific intervention effects for the secondary outcome measures alcohol use problems, drug use problems, and psychiatric symptom severity. This is in line with previous intervention research in this population. Although mental health co-morbidity is common in individuals with substance use disorders (SAMHSA, 2017), there is limited evidence for the effectiveness of psychological interventions for dual diagnosis patients. A 2013 Cochrane review concluded there is no compelling evidence to support any one psychosocial treatment over another to improve mental state or reduce substance use in people with co-occurring severe mental illness and substance use problems (Hunt et al., 2013).

The SOS training was not effective in preventing property victimization (Bayes factor = 0.17). As described above, property victimization has been associated with theft offending (chapter 4), which has been associated with drug use problems and alcohol use problems (chapter 5). Therefore, one could hypothesize that the risk of property victimization reduces when patients achieve abstinence in regular addiction treatment. Unfortunately, as concluded in chapter 4, other determinants of property victimization in dual diagnosis patients are still largely unknown. Interestingly, we did find that more participants who received inpatient care at baseline achieved treatment response for property victimization compared to those who received outpatient care at baseline (chapter 7). Possibly, inpatient treatment resulted in larger reduction of substance use problems compared with outpatient treatment, accompanied by a reduced number of incidents of property victimization. Another explanation could be that those in inpatient

care have learned from codes with regard to taking care of personal belongings, for instance by locking the door of one's room when one is away.

With regard to violent victimization, we found anecdotal evidence for effectiveness of the SOS training (Bayes factor = 2.26). Presumably, the intervention effect on total victimization was mainly due to a reduction in the number of violent victimization incidents. This might be explained by the type of skills addressed in the SOS training: although the module Streetwise is focused on enhancing street skills to reduce vulnerability to both property and violent victimization, the modules Self-wise and Other-wise target skills that have mainly been related to violent victimization (chapter 4). Besides, the modules Self-wise and Other-wise were descriptively rated as more educational (respectively 8.0 and 8.4) compared to Streetwise (7.6), indicating that these modules might have been more apt to participants' needs. In order to shed some more light on these possibilities, our subsequent aim is to evaluate the efficacy of the SOS training with regard to all other secondary outcome measures described in the study protocol (chapter 6), including interpersonal problems, emotion dysregulation, self-esteem, quality of life, and cost-effectiveness. Regarding cost-effectiveness, we hypothesize that the additional costs of adding the SOS training to usual care will be relatively low compared to the total healthcare costs of our sample of dual diagnosis patients.

Although adding the SOS training to usual care was more effective in preventing victimization compared to usual care alone, the majority of participants in the experimental condition still experienced victimization during the follow-up period. Replication studies should be conducted that include an active control group and a more extensive assessment of treatment outcome, and examine working mechanisms, long-term effects, and outcome predictors. To further optimize the content of the SOS training, focus groups should be organized with participants who were randomized to receive the SOS training, but were nevertheless victimized during the follow-up period, with a particular emphasis on the needs of those with a lower level of education (chapter 7). Suggestions to further optimize the content of SOS training emerging from this thesis are to more comprehensively address the victim-perpetrator overlap (chapter 4), individual differences in types of interpersonal problems (chapter 4), and gender differences in characteristics of victimization incidents (chapter 3). In the current version of the SOS training, participants create a 'Personal Other-wise Plan' during the first session of the module Other-wise, in which they specify conflict resolution skills they wish to improve, for instance making eye contact, speaking clearly, expressing feelings, or staying calm. This module could be more tailored to individual needs by analyzing and discussing interpersonal styles of participants throughout the training,

and the accompanying risks. Consequently, more specific areas for improvements with regard to interpersonal conflict resolution skills can be incorporated into the Personal Other-wise Plan. These personal plans could provide guidance for the role-playing exercises and their evaluation.

**The use of student samples for understanding victimization and its consequences**

In order to contribute to the empirical basis for changeable psychological vulnerabilities related to victimization, a supplementary study was conducted in female college students. As outlined in the introduction of this thesis, several studies in college students have suggested that impaired risk perception (Walsh et al., 2012) and emotion dysregulation (Carlson & Duckworth, 2016; Messman-Moore et al., 2013; Walsh et al., 2012) are associated with sexual victimization. Marx et al. (2005) theorized that childhood sexual abuse elicits emotion regulation difficulties, and that these difficulties may in turn impair one's ability to recognize risk cues, thereby increasing one's vulnerability to future victimization. In chapter 8 we demonstrated that we were not able to replicate any of the proposed links between sexual victimization, risk perception, and emotion dysregulation in a sample of 276 Dutch female college students. Previous studies in this field have provided mixed results: although some have found evidence for impaired risk perception in those with a history of sexual victimization (Neilson et al., 2018; Soler-Baillo et al., 2005; Walsh et al., 2012; Wilson et al., 1999; Yeater et al., 2010), others did not (Breitenbecher, 1999; Carlson & Duckworth, 2016; Chu et al., 2014; Vanzile-Tamsen et al., 2005). One study reported the opposite finding: improved risk perception in participants who were victimized multiple times compared to single-incident victims (Yeater & O'donohue, 2002). Our study does not provide a definite answer as to whether the proposed relationships exists. However, our findings in the context of the literature do highlight the need for improvements in this field, namely the need for a clear conceptualization of risk perception and the use of more sophisticated measurement methods, such as virtual reality, to establish a higher applicability of findings to real-life situations. Additionally, in chapter 8 we made a plea for the publication of all initiated studies, regardless of the direction or strength of its findings, as otherwise the probability of a relationship could be overestimated as a result of publication bias (Dickersin, 1990). This is especially important as targets for intervention are derived from empirical studies that provide an indication for vulnerabilities associated with victimization. Enhancing emotion regulation skills is an important component of the SOS training chapter 6 and 7), and of internet-based emotion regulation training (iERT) that aims to reduce victimization in depressed patients and is currently being investigated in a randomized clinical trial (Christ et al., 2018). The focus on emotion dysregulation as intervention target for victimization prevention should be reconsidered, as both in our student sample (chapter 8) and

our sample of dual diagnosis patients (chapter 4), we did not find evidence for the hypothesized association between violent victimization and emotion dysregulation. In the near future, outcomes of an ongoing clinical trial conducted by Christ et al. (2018) will provide an indication as to whether this relationship is present in depressed patients, and whether iERT is effective in reducing victimization in these patients.

As mentioned previously, several studies have indicated that those with a history of childhood abuse are at increased risk of future victimization (e.g. Christ et al., 2019; Roodman & Clum, 2001), although underlying mechanisms are yet unclear. Moreover, childhood abuse has consistently been identified as a risk factor for developing mental disorders (Hovens et al., 2010; Kessler et al., 1997). In line with previous studies (Gibb et al., 2007; Nelson et al., 2017; Norman et al., 2012; Spertus et al., 2003), in our college student sample, we found that especially childhood emotional abuse was related to depressive symptoms (chapter 9). Christ et al. (2019) have suggested that childhood trauma may act as a confounder in the association between mental disorder and victimization. In their prospective, population-based study, the authors reported an association between suffering from any mental disorder and violent victimization, that was no longer significant when the model was adjusted for childhood trauma. In our college student sample, the relationship between childhood emotional abuse and depression was mediated by emotion dysregulation and interpersonal problems (chapter 9). Possibly, the psychological consequences of childhood abuse result in both an elevated risk for developing mental disorders and an increased risk for victimization, for instance through an increase in interpersonal problems. Future research should examine the prevalence and consequences of different types of childhood adversities in dual diagnosis patients, and to what extent these are related to their risk of revictimization in adulthood.

## Strengths and limitations

**Strengths**

The main strength of this thesis is the novelty of the research. The SOS training is the first intervention aimed at reducing victimization in patients with mental illnesses that is evaluated in an RCT. Moreover, chapter 2 is the first study worldwide to compare the prevalence of victimization in dual diagnosis patients with the general population. Chapter 3 is the first study to examine characteristics of dual diagnosis patients associated with violent and property victimization. In addition, chapter 4 is the first study to examine gender differences in characteristics of violent victimization in this patient group. The insights derived from our research have provided us with

straightforward implications for clinical practice as well as directions for future research to further contribute to effective victimization prevention.

An additional strength is the methodological quality of our research, in comparison with previous studies evaluating psychosocial interventions in dual diagnosis patients. Most of the RCTs that have been conducted to evaluate psychosocial interventions in patients with severe mental illness and substance use problems have faced methodological challenges, such as low sample size, high drop-out rates, an unclear description of the randomization process, and a high risk of bias (Hunt et al., 2013). The current study demonstrates that it is achievable to conduct a clinical trial in dual diagnosis patients with a considerable large sample size acquired in a reasonable amount of time and a limited loss to follow-up, and may encourage others to conduct high-quality trials in this complex patient group to ultimately improve their treatment outcomes.

A third strength of this thesis is the heterogeneity of our sample of dual diagnosis patients. In order to reflect clinical practice, a minimal set of exclusion criteria was applied. Establishing what works for dual diagnosis patients is complicated given the wide spectrum of existing substance use and mental health problems, and their possible combinations. Pharmacological and neurological interventions may be highly specific, but with regard to psychosocial interventions it may be most appropriate to acknowledge that dual diagnosis patients have more generic complex needs that extend beyond their specific disorders, such as the need for safe housing, social support, meaningful activities, and interventions to improve relevant skills. The SOS training is designed to be a transdiagnostic intervention to improve skills and prevent victimization in a group of patients with a very diverse set of mental disorders according to the *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association, 2000), which facilitates its implementation in clinical practice.

**Limitations**

An important limitation of the findings reported in chapter 2, 3, 4, and 5 is that these findings are based on baseline data of our RCT, which may limit their generalizability. Some of the patients who declined participation due to a lack of motivation to undergo the intervention, might have participated if the study would merely have consisted of assessments. In addition, our findings presented in chapter 4 and 5 are limited by the absence of data on childhood adversities, as there is evidence that childhood abuse may be an important risk factor for both revictimization (e.g. Christ et al., 2019; Roodman & Clum, 2001) and perpetration (e.g. Smith & Thornberry, 1995; Widom & Maxfield, 1996) in adulthood, although this has not yet been examined in

dual diagnosis patients. Moreover, due to the cross-sectional design of the research presented in chapter 4 and 5 we are unable to determine temporal relationships between variables.

Another limitation of our research is that our measure of victimization was based on self-report, which is subject to memory bias. Studies that have examined the accuracy of self-report measures of victimization have demonstrated that respondents can forget about incidents, or be wrong about the timing of incidents (Biderman & Lynch, 1981; Schneider, 1981; Skogan, 1975). In addition, victimization surveys are constructed to be comprehensible for the general public, therefore the scope of certain crimes may be somewhat broader than the juridical definition (Wittebrood, 2006). However, self-reports tend to be more accurate compared to police reports, which are likely to underestimate victimization rates (Rand & Catalano, 2007). This is supported by our finding that dual diagnosis patients are very unlikely to report incidents of violent victimization to the police (chapter 3). Furthermore, self-reports of abuse have shown to be reliable over time in individuals with severe mental illness (Goodman et al., 1999).

The use of a female college student sample in chapter 8 and 9 limits the generalizability of the findings to more diverse populations (Hanel & Vione, 2016; Henrich, Heine, & Norenzayan, 2010). The use of convenience samples of college students is very common in studies examining psychological processes due to the facility of recruitment and low costs of administration (Druckman & Kam, 2009; Sears, 1986). Although research in college students can be a feasible first step for theory testing, findings should be replicated in order to draw conclusions about the population of interest. Finally, with regard to chapter 8, we could not determine whether emotion regulation difficulties and interpersonal problems temporally preceded the onset of depressive symptoms, due to the cross-sectional design of the study.

## Recommendations for clinical practice and policy making

**Clinicians and guideline developers should be aware that dual diagnosis patients are vulnerable to victimization**

Our findings presented in chapter 2 indicate that dual diagnosis patients are at highly increased risk to become victims of violence and property crime. Our findings presented in chapter 4 and 5 indicate that victimization is more prevalent than perpetration among these patients, as has previously been observed in patients with severe mental disorders (Brekke et al., 2001; Choe et al., 2008). Nevertheless, their risk of harmful

behavior dominates the public's view and scientists' focus. It should be recognized that as a group, dual diagnosis patients are highly vulnerable to victimization. Our findings presented in chapter 3 indicate that the vast majority of patients did not discuss physical or sexual abuse with caregivers. Similarly, research among patients with severe mental illness has demonstrated that there is an underdetection of victimization because clinicians do not routinely ask about it (e.g. Howard et al., 2010), with perceived barriers being: limited confidence in their competence to address violence, and the beliefs that patients may be offended by, or do not benefit from routine enquiry. We aim to lower these barriers by demonstrating that it is possible to openly discuss victimization with patients and that skills training can contribute to prevention of victimization (chapter 7). In the light of these findings, we strongly encourage clinicians to become aware of their own barriers to enquiry and to discuss with colleagues how these barriers can be overcome. As detection is the first step in addressing victimization, all dual diagnosis patients should routinely be screened and monitored for victimization, both during intake and throughout treatment.

**The SOS training can be implemented in addiction-psychiatry services to contribute to victimization prevention in dual diagnosis patients**

Our findings presented in chapter 7 indicate that in dual diagnosis patients, adding SOS training to care as usual is more effective in preventing victimization compared to care as usual alone. The 12-session group-based intervention is fairly easy to implement in addiction-psychiatry services, as it can be provided by psychologists and nurses after a modest amount of training. For the purpose of our clinical trial, the SOS training was successfully implemented in an inpatient as well as outpatient facility and positively evaluated by participants and enthusiastically received by staff. Reasons for loss to treatment were mainly practical: being discharged from the care facility, being transferred to a hospital or (another) mental health ward, having overslept, and lack of time due to health- or work related appointments. Although these type of barriers to treatment completion cannot always be avoided in clinical practice, they should be eliminated as much as possible, for instance by improving treatment planning. The SOS training can be implemented in addiction-psychiatry services to reduce victimization rates in dual diagnosis patients.

**High-quality research aimed at improving treatment outcomes for dual diagnosis patients' needs to be stimulated and financially supported**

We did not find evidence for an effect of adding the SOS training to usual care on alcohol and drug use problems and psychiatric symptom severity. This is in line with a Cochrane review indicating there is no compelling evidence for any psychosocial intervention to reduce substance use or improve mental state in patients with

substance use disorders and severe mental illness (Hunt et al., 2013). Given the high prevalence of dual diagnosis and its high burden of disease, there is an urgent need to improve treatment outcomes for dual diagnosis patients. Most of the RCTs that have been conducted to evaluate the effectiveness of psychosocial interventions in dual diagnosis patients have faced considerable methodological challenges including low sample size, high drop-out rates, an unclear description of the randomization process, and a high risk of bias (Hunt et al., 2013). The current thesis has demonstrated that it is achievable to conduct a clinical trial in dual diagnosis patients with a considerable large sample size acquired in a reasonable amount of time, and a limited loss to follow-up. Therefore, we strongly encourage governmental and public health institutions to stimulate and financially support high-quality research to examine the effectiveness of psychological interventions in this complex patient group, to improve their treatment outcomes.

# Conclusion

Dual diagnosis patients are at increased risk to become victims of violence and property crime. The SOS training is a promising new intervention to reduce vulnerability to victimization and thereby prevent victimization in dual diagnosis patients. Replication studies should be conducted that include an active control group, and examine working mechanisms and long-term effects. Our findings indicate that providing dual diagnosis patients with a relatively brief skills training can lead to considerable improvements. There is an urgent need for more high-quality clinical trials to examine the effectiveness of psychological interventions in dual diagnosis patients, to further improve their treatment outcomes and quality of life.

# Part V

# Appendices

# Appendices

## A. References

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# Appendices

## B. Dutch summary | Nederlandse samenvatting

# SOS

Het beter begrijpen en verminderen van kwetsbaarheid voor victimisatie bij dubbele diagnose patiënten

**Introductie**
Sinds het einde van de jaren '90 is aangetoond dat mensen met een psychische aandoening een verhoogd risico hebben om slachtoffer te worden van criminaliteit. Echter, er is een gebrek aan effectief bewezen interventies om de kwetsbaarheid van patiënten voor victimisatie te verminderen. We spreken van *dubbele diagnose* bij het samen voorkomen van een stoornis in het gebruik van middelen en een andere psychische aandoening. In de literatuur wordt gesuggereerd dat dubbele diagnose patiënten bijzonder kwetsbaar zijn voor victimisatie, maar determinanten en kenmerken van victimisatie waren in deze patiëntengroep nooit onderzocht. Het hoofddoel van het huidige onderzoeksproject was om een interventie te ontwikkelen om kwetsbaarheid voor victimisatie te verminderen bij dubbele diagnose patiënten en de effectiviteit van deze interventie te onderzoeken in een gerandomiseerde klinische trial. Daarnaast was het doel om de prevalentie, determinanten en kenmerken van victimisatie onder dubbele diagnose patiënten in kaart te brengen. Tenslotte werd er een extra onderzoek opgezet onder vrouwelijke studenten, om meer kennis te vergaren over de onderliggende mechanismen van kwetsbaarheid voor victimisatie.

**Deel 1: Slachtofferschap en daderschap in dubbele diagnose patiënten**
In het eerste deel van dit proefschrift beschrijven we onze bevindingen met betrekking tot de prevalentie en kenmerken van slachtofferschap en daderschap in dubbele diagnose patiënten.

In **hoofdstuk 2** concludeerden we dat dubbele diagnose patiënten een verhoogde kans hebben om slachtoffer te worden van een misdrijf in vergelijking met de algemene populatie van Amsterdam. De 243 geïnterviewde patiënten bleken in vergelijking met de algemene populatie een 15 keer grotere kans te hebben om slachtoffer te zijn geweest van fysiek geweld in het voorgaande jaar. Bovendien hadden zij een zes keer zo grote kans om slachtoffer te zijn geweest van seksueel geweld en een twee keer zo grote kans om slachtoffer te zijn geweest van een vermogensdelict. In **hoofdstuk 3** exploreerden we kenmerken van victimisatie bij mannelijke en vrouwelijke patiënten met een dubbele diagnose. We vonden dat mannen het vaakst fysiek mishandeld werden door een vreemde in het openbaar, terwijl vrouwen het vaakst fysieke mishandeling meemaakten door hun (ex)partner in hun eigen huis. Daarnaast toonden we aan dat seksueel geweld vaker voorkwam bij vrouwelijke patiënten. Tenslotte concludeerden

we dat dubbele diagnose patiënten niet geneigd zijn om het meemaken van fysiek of seksueel geweld te melden aan politie en zorgverleners. In **hoofdstuk 4** onderzochten we welke factoren geassocieerd zijn met slachtofferschap in de dubbele diagnose populatie. We vonden bij mannen een associatie tussen gewelddadige victimisatie en zowel jonge leeftijd als interpersoonlijke problemen waarbij men zich bijzonder meegaand en opofferend opstelt tegenover anderen. Bij vrouwen was gewelddadige victimisatie juist geassocieerd met een dominante en controlerende interpersoonlijke stijl, terwijl sociale terughoudendheid als beschermende factor gevonden werd. Daarnaast bestond er bij vrouwen een verband tussen gewelddadige victimisatie en dakloosheid. Bij mannelijke en vrouwelijke dubbele diagnose patiënten was het slachtoffer worden van zowel een gewelds- als vermogensdelict geassocieerd met het zelf gepleegd hebben van een delict in het afgelopen jaar. Omdat het om cross-sectioneel onderzoek gaat kon de richting van de beschreven verbanden niet bepaald worden. In **hoofdstuk 5** hebben we nader gekeken naar daderschap in onze steekproef van 243 dubbele diagnose patiënten. De meerderheid van de steekproef (52%) rapporteerde het plegen van tenminste één delict in het afgelopen jaar. Meer specifiek vonden we dat 24% van de patiënten een geweldsdelict (fysiek en/of seksueel) rapporteerde, 28% het uiten van bedreigingen rapporteerde en 28% een vermogensdelict rapporteerde. Het plegen van een geweldsdelict bleek geassocieerd te zijn met jongere leeftijd, ernstigere alcoholproblemen, meer symptomen van manie/desorganisatie en blootgesteld zijn aan een traumatische gebeurtenis.

**Deel 2: De SOS training ter preventie van victimisatie van dubbele diagnose patiënten**

In het tweede deel van dit proefschrift beschrijven we het onderzoeksprotocol van de gerandomiseerde klinische trial en de effectiviteit van de SOS training: een nieuwe interventie om kwetsbaarheid voor victimisatie te verminderen bij dubbele diagnose patiënten.

Het onderzoeksprotocol van de enkelblinde gerandomiseerde klinische trial werd beschreven in **hoofdstuk 6.** We introduceerden in dit hoofdstuk de SOS training: een nieuwe interventie die bestaat uit 12 groepssessies en zich richt op het verbeteren van emotieregulatie vaardigheden, conflicthanteringsvaardigheden en straatvaardigheden van dubbele diagnose patiënten. Het primaire doel van de gerandomiseerde trial was om te onderzoeken of het toevoegen van de SOS training aan de standaardbehandeling van dubbele diagnose patiënten resulteert in een sterkere afname van victimisatie. Wanneer het aantal door een deelnemer gerapporteerde victimisatie incidenten op de eindmeting met tenminste 50% was afgenomen ten opzichte van de beginmeting, werd dit gezien als een positief behandelresultaat. In **hoofdstuk 7** beschreven we

de primaire bevindingen van de gerandomiseerde trial. Er werd significant vaker een positief behandelresultaat voor *totale victimisatie* gerapporteerd door patiënten die gerandomiseerd waren om de SOS training te volgen, in vergelijking met de groep die alleen standaardzorg aangeboden kreeg. De resultaten met betrekking tot preventie van gewelddadige victimisatie waren niet eenduidig. De SOS training was niet effectief in preventie van slachtofferschap van vermogensdelicten. Er werden geen significante groepsverschillen gevonden in alcohol- en druggerelateerde problemen en psychische klachten. We concludeerden dat de SOS training geïmplementeerd kan worden in behandelcentra voor dubbele diagnose patiënten ter bevordering van preventie van victimisatie.

**Deel 3: Victimisatie onder vrouwelijke studenten**
In het derde deel van dit proefschrift beschrijven we onze bevindingen met betrekking tot de verbanden tussen seksuele victimisatie, risicoperceptie en emotieregulatie in vrouwelijke studenten en de impact van drie vormen van kindermishandeling op het ontwikkelen van depressieve symptomen in deze groep.

In **hoofdstuk 8** beschreven we dat we op basis van voorgaand onderzoek verwachtten dat seksuele victimisatie geassocieerd zou zijn met emotieregulatie problemen en verminderde risicoperceptie. Op basis van ons onderzoek in een steekproef van 276 vrouwelijke studenten rapporteerden we vervolgens dat we voor geen van de veronderstelde verbanden bewijs vonden. In **hoofdstuk 9** toonden we op basis van onderzoek in dezelfde steekproef aan dat emotionele kindermishandeling geassocieerd was met depressieve symptomen, emotieregulatie problemen en interpersoonlijke problemen. Tenslotte rapporteerden we dat de relatie tussen emotionele kindermishandeling en depressieve symptomen cross-sectioneel gemedieerd werd door emotieregulatie problemen en interpersoonlijke problemen in de domeinen koud/afstandelijk en dominant/controlerend.

**Deel 4: Conclusies**
In het vierde deel van dit proefschrift vatten we onze belangrijkste bevindingen samen, bediscussiëren we onze bevindingen in de context van de literatuur en beschrijven we de implicaties voor vervolgonderzoek en de klinische praktijk.

Om onze kennis over victimisatie van dubbele diagnose patiënten verder te vergroten, zou toekomstig onderzoek zich moeten richten op het bepalen van determinanten en kenmerken van victimisatie in longitudinaal onderzoek, in diverse steekproeven van dubbele diagnose patiënten, waarbij er in het bijzonder gekeken wordt naar sekseverschillen, de overlap tussen slachtofferschap en daderschap en de impact

van verschillende soorten kindermishandeling en andere ingrijpende gebeurtenissen tijdens de jeugd. Op basis van kennis over onderliggende mechanismen van kwetsbaarheid voor victimisatie kunnen interventies meer toegesneden worden op specifieke behoeften van subgroepen patiënten.

De SOS training is een veelbelovende nieuwe interventie die kan bijdragen aan preventie van victimisatie van dubbele diagnose patiënten. De interventie, bestaande uit 12 groepsbijeenkomsten, is gemakkelijk te implementeren in zorginstellingen, aangezien deze kan worden gegeven door psychologen en verpleegkundigen na een bescheiden hoeveelheid training van twee dagdelen. We moedigen professionals werkzaam in de verslavingspsychiatrie aan om de SOS training te implementeren en om samen te werken met wetenschappers om replicatieonderzoek te verrichten om werkingsmechanismen en langetermijneffecten van de SOS training te onderzoeken. Enkele voorbeelden van oefeningen uit de SOS training zijn opgenomen als bijlage bij dit proefschrift. De trainingshandleiding zal gratis online beschikbaar gemaakt worden via www.victimizationresearch.com.

De meeste gerandomiseerde klinische trials die tot op heden zijn verricht om de effectiviteit van psychologische interventies te onderzoeken in een steekproef van dubbele diagnose patiënten kampten met substantiële methodologische beperkingen. Dit proefschrift laat zien dat het haalbaar is om een gerandomiseerde klinische trial te verrichten in deze patiëntenpopulatie met een redelijke steekproefgrootte, in een redelijk tijdsbestek, met een gering aantal uitvallers. Gezien de hoge prevalentie van dubbele diagnose en de hoge ziektelast is er een urgente behoefte aan meer klinische trials om de effectiviteit van psychologische interventies te onderzoeken, om uiteindelijk de behandelresultaten van dubbele diagnose patiënten verder te verbeteren.

# Appendices

## C. English summary

# SOS

Improving awareness, understanding, and prevention of victimization among dual diagnosis patients

**Introduction**

Since the late 1990s, studies have consistently shown that individuals with mental disorders are at increased risk to become victims of crime, yet there is a lack of evidence-based interventions to reduce patients' vulnerability to victimization. *Dual diagnosis* is the co-occurrence of a substance use disorder and another mental disorder. It has been suggested that dual diagnosis patients are particularly vulnerable to become victims of crime, although determinants and characteristics of victimization had never been examined in this group. The major aim of the current research project was to develop an intervention to prevent victimization in dual diagnosis patients and evaluate its efficacy in a randomized controlled trial. Moreover, we aimed to gain more insight into the prevalence, determinants, and characteristics of victimization among dual diagnosis patients. Finally, an additional study was conducted in female college students to contribute to the theoretical framework for psychological mechanisms underlying risk of victimization.

**Part I: Victimization and offending in dual diagnosis patients**

In the first part of this thesis we describe our findings with regard to the prevalence, characteristics, and associated factors of victimization and offending in dual diagnosis patients.

In **chapter 2**, we concluded that dual diagnosis patients are more likely to be victims of crime compared to the general population of Amsterdam. Disturbingly, the 243 dual diagnosis patients that were included in the study were 15 times more likely to have been a victim of physical abuse, six times more likely to have been a victim of sexual assault, and twice as likely to have been a victim of a property crime, in comparison with the general population. In **chapter 3**, we explored gender differences in characteristics of physical and sexual abuse of male and female dual diagnosis patients. We demonstrated that male patients with dual diagnosis were most often physically abused by a stranger in a public area, whereas female patients were most frequently physically abused by an (ex)partner in their own home. Furthermore, we concluded that sexual assault victimization was more prevalent in female patients compared to male patients. We indicated that dual diagnosis patients were unlikely to report physical and sexual victimization to the police and caregivers. In **chapter 4** we examined factors associated with violent and property crime victimization. We showed that in the

subgroup of male dual diagnosis patients, younger patients were at higher risk of both violent and property victimization. Furthermore, violent victimization was independently associated with a self-sacrificing, overly accommodating interpersonal style in males. In female dual diagnosis patients, violent victimization was independently associated with homelessness and with a domineering/controlling interpersonal style, whereas a socially inhibited and cold/distant interpersonal style was protective against violent victimization. In both male and female patients, both violent and property victimization were independently associated with offending. In **chapter 5**, we demonstrated that the majority of our sample (52%) reported perpetration of at least one offense in a timeframe of one year. More specifically, 24% reported violent offending (physical and/or sexual assault), 28% reported having threatened others, and 28% reported property crime perpetration. Violent offending was independently associated with younger age, severity of alcohol use problems, higher manic/disorganization symptoms, and lifetime trauma exposure.

**Part II: The SOS training to prevent victimization in dual diagnosis patients**
In the second part of this thesis we outline the study protocol of the clinical trial and report the efficacy of the SOS training: a newly developed intervention to prevent victimization in dual diagnosis patients.

The study protocol of our single-blind randomized clinical trial was described in **chapter 6**. We introduced the Self-wise, Other-wise, Streetwise (SOS) training: a newly developed 12 session group-based skills training, focused on improving emotion regulation skills, conflict resolution skills, and street skills in dual diagnosis patients. The primary aim of the randomized clinical trial was to investigate whether the addition of SOS training to care as usual results in a larger reduction of victimization compared to care as usual alone. In **chapter 7** we reported the key findings of our randomized clinical trial. We demonstrated that significantly more participants who were randomized to receive SOS training as add-on to usual care achieved treatment response on the primary outcome measure total victimization compared to those who received usual care alone. Results for treatment response for violent victimization were inconclusive as to whether a difference was present between groups. There were no significant group differences in treatment response for property victimization. No significant overall or time-specific intervention effects were found for alcohol use problems, drug use problems, or psychiatric symptom severity. We concluded that the SOS training can be implemented in addiction-psychiatry services to effectively contribute to victimization prevention in dual diagnosis patients.

**Part III: Victimization in female college students**

In the third part of this thesis we describe our findings regarding the relationship between sexual victimization, risk perception, and emotion regulation in female college students, and the impact of three types of childhood abuse on depressive symptoms in this population.

In **chapter 8** we hypothesized that sexual victimization history would be associated with emotion regulation difficulties and impaired risk perception in a sample of 276 female college students. We reported that we did not find evidence for any of the expected relationships between sexual victimization, risk perception, and emotion regulation difficulties. In **chapter 9** we demonstrated that childhood emotional abuse was independently associated with depressive symptoms, emotion dysregulation, and interpersonal problems in the same sample of female students. Additionally, we reported that the relationship between childhood emotional abuse and depressive symptoms was cross-sectionally mediated by emotion dysregulation and the following domains of interpersonal problems: cold/distant and domineering/controlling.

**Part IV: Conclusions**

In the fourth part of this thesis we summarize our main findings, discuss them in the context of the literature, and consider their implications for future research and clinical practice.

To further expand our knowledge on victimization in dual diagnosis patients, future studies should examine determinants and characteristics of victimization among these patients in both rural and urban environments and across different cross-cultural contexts, address the victim-offender overlap, and take gender differences and childhood adversities into account; preferably in a longitudinal design. This can offer more insight into underlying mechanisms and may result in suggestions for more tailored interventions to suit subgroups of patients with different vulnerabilities.

The SOS training is a promising new intervention to contribute to the prevention of victimization in dual diagnosis patients. The 12-session group-based intervention is fairly easy to implement in addiction-psychiatry services, as it can be provided by psychologists and nurses after a modest amount of training. We encourage clinicians involved in addiction-psychiatry services to implement the training, and to work together with researchers to conduct replication studies to examine working mechanisms and long-term effects. We have provided several examples of exercises from the SOS training as an appendix to this thesis. The training manual will be made available via www.victimizationresearch.com, free of charge.

Most previous clinical trials that have been conducted in the dual diagnosis population have faced considerable methodological challenges. This thesis demonstrates that it is achievable to conduct a randomized clinical trial in this population with a considerable large sample size acquired in a reasonable amount of time, with a limited loss to follow-up. Given the high prevalence of dual diagnosis and its high burden of disease, there is an urgent need for high-quality clinical trials to examine the effectiveness of psychological interventions in dual diagnosis patients, to further improve their treatment outcomes.

# Appendices

## D. Examples of SOS exercises

# Example Streetwise

**Exercise: True or False?**
Split the room in two with a piece of rope, tape, or something similar. Explain the exercise:
"In a moment I will read several statements about safety. If you believe this statement is *true* you walk to the left side of the room. If you believe this statement is *false*, you walk to the right side of the room."

Read the statements one-by-one. After each statement, ask several participants why they have chosen to stand on a particular side of the room. The goal of the exercise is to encourage participants to reflect on their behavior and to have a group discussion. If applicable, discuss whether there is a difference between what participants *know* about safety and how they actually *act*. The other trainer can participate in the exercise and give his or her personal opinion about the statements, to further stimulate the discussion. Both trainers should use their cardboard stars (see Figure 1) to reinforce participants who share something with the group and should encourage participants to give each other stars as well.

**Examples of statements**
In public, when you look around, you will draw more attention to yourself and therefore you will be more vulnerable.
It is safer to buy drugs from someone you know than to buy drugs from a stranger.
If someone pulls a weapon it is wise to do as he or she commands.

**Figure 1.** Cardboard stars used to express appreciation about something another participant said or did during the training.

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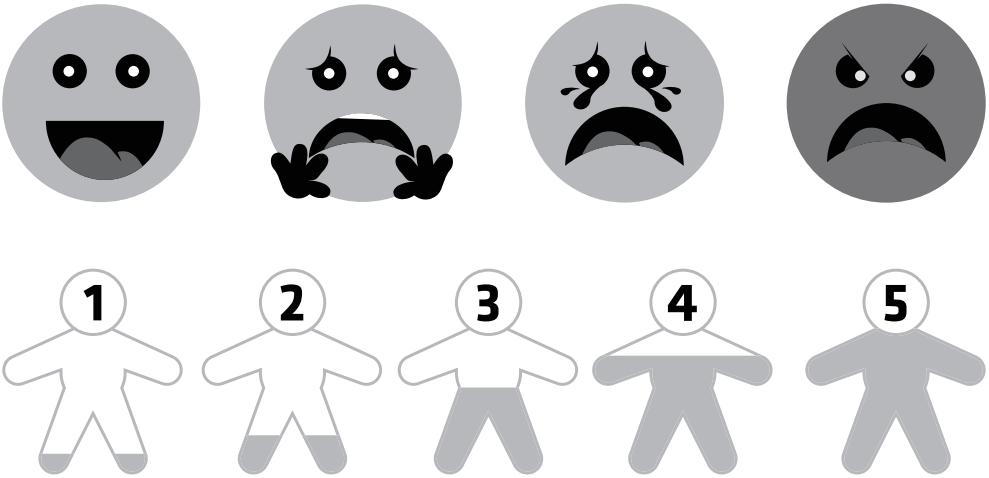
# Example Self-wise

**Exercise: How are you feeling?**
The emoticons and intensity board depicted in Figure 2 are used to discuss how participants are feeling, both at the start of each session and throughout the sessions.

All participants receive four cardboard emoticons and one intensity board. At the start of each session, all participants are requested to indicate how they are currently feeling by putting one or several emoticons on the intensity board. Both trainers participate in this exercise by sharing how they are feeling by portraying this with the materials. It is possible for participants to use more than one emoticon at the same time, when one is experiencing a mix of emotions.

**Figure 2.** Cardboard emoticons and intensity board.

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# Example Other-wise

**Role-plays: dealing with frustrating situations**
Take the participants to the training area and let them bring their 'Personal Other-wise Plan'. One participant is asked to volunteer in the first role-play of the current theme: dealing with frustrating situations.

"In a moment we will start with a role-play in which I will do or say something that might frustrate you. It is important to keep in mind that it is a role-play, and not actually true. You are invited to react in the way that you would if this would happen to you in real life. All other participants are invited to pay careful attention: try to note what he or she is doing quite well, and also potential areas for improvement."

**Example role-play**
The trainer walks up to participant with a fake cell-phone in his/her hand, hands it over to the participant and says: "Hi there, I had borrowed your phone and I would like to give it back to you. Here it is. Oh by the way, the camera function has broken down. Good luck with that!"

After each role-play, both positive and constructive feedback are gathered from the participant him- or herself, the other group members, and both trainers. The emoticons and intensity board (see Figure 2) are used to portray feelings that the participant experienced and that the other group members have recognized during the role-play. Cardboard stars (see Figure 1) are used to positively reinforce participants who dare to participate in the role-plays and group members who provide constructive feedback. Particular attention is paid to: making eye contact, speaking clearly, expressing your feelings, standing up for yourself, speaking about solutions instead of problems. After personal areas for improvement are formulated for the participant, the role-play is repeated.

# Appendices

## E. Portfolio and list of publications

**PhD student:** Marleen M. de Waal
**Period:** August 2013 – January 2019
**Supervisors:** prof. dr. Anna E. Goudriaan, prof. dr. Jack J.M. Dekker, dr. Martijn J. Kikkert

# Training

**Visiting scholar**

2018 Miami University, Department of Psychology, Oxford, Ohio, United States

**General courses**

2014 Scientific writing, AMC Graduate School
2014 Basic course on Regulations and Organisation for clinical investigators, BROK registration, AMC Graduate School
2013 Oral presentation in English, AMC Graduate School

**Courses in statistics and epidemiology**

2017 Missing values: consequences and solutions, EpidM
2016 Longitudinal data-analysis, EpidM
2016 Multilevel analysis, EpidM
2015 Computing in R, AMC Graduate School
2015 Advanced topics in biostatistics, AMC Graduate School
2014 Practical biostatistics, AMC Graduate School

**Clinical training**

2019 EMDR training course (basisopleiding), E. ten Broeke
2018 Imagery Rescripting, two-day course, A. Arntz
2018 Prolonged Exposure, two-day course, A. van Minnen
2017 VGCT course (100-uurs basiscursus), Forta Opleidingen
2017 CGT for substance use disorders, Arkin
2015 Motivational Interviewing, W.R. Miller

# Grants

2018 Co-applicant 'Treating PTSD in patients with co-occurring substance use disorders: a randomized controlled trial to compare the effectiveness of different types and timing of treatment'; Principal applicant: Prof. dr. A.R. Arntz, University of Amsterdam; other co-applicants: Prof. dr. A.E. Goudriaan, Dr. L.A. Marquenie; Funder: Stichting tot Steun VCVGZ, Amount: €507.577

2017 Van der Gaag Grant for a research visit at Miami University, Oxford, USA; project 'Victimization and emotion regulation as predictors of impaired risk perception in female college students'; Funder: The Royal Netherlands Academy of Arts and Sciences (KNAW), Amount: €2.600

# Presentations

**International conferences**

2018 Society for Psychotherapy Research (SPR), Amsterdam, the Netherlands
2018 American Psychiatric Association (APA) Annual Meeting, New York, USA
2017 European Congress on Integrated Care & Assertive Outreach (EAOF), Hamburg, Germany
2016 European Association for Behavioral and Cognitive Therapies (EABCT), Stockholm, Sweden
2016 Society for Psychotherapy Research (SPR), Jerusalem, Israel
2015 European conference on Violence in Psychiatry, Copenhagen, Denmark
2014 European Association of Substance Abuse Research (EASAR), Luneburg, Germany
2013 European conference on Violence in Psychiatry, Ghent, Belgium

**Dutch symposia**

2017 Zorgprogramma-dag Psychose en EPA, Pro Persona, Nijmegen
2016 Jaarsymposium Verslaving, Amsterdam
2016 Forum Alcohol en Drugs Onderzoek (FADO), Utrecht
2016 Congres Slachtofferschap, Trauma en Geweld, Driebergen
2016 Symposium Seksueel grensoverschrijdend gedrag, Amsterdam
2015 Voorjaarscongres Nederlandse Vereniging voor Psychiatrie (NVVP), Maastricht
2014 Forum Alcohol en Drugs Onderzoek (FADO), Utrecht

# Teaching

**Guest lectures**

| | |
|---|---|
| 2016 | Victimization of patients with mental disorders - Psychiatry residency program, Arkin |
| 2014, 2015 | Substance use disorders - Bachelor's program Psychology, VU University |

**Supervising and tutoring**

| | |
|---|---|
| 2014 – 2017 | Supervising seven clinical psychology, medicine, and evidence based practice master students in writing their master thesis |
| 2013 – 2017 | Tutoring and mentoring nine research assistants in their practical research activities for the SOS-study and PRED-EX study |
| 2014 – 2017 | Training and supervising six psychologists and eight nurses in delivering the SOS-training |

# Other activities

| | |
|---|---|
| 2015, 2016 | Co-organizer Symposium 'Is addiction a disease?', Theater de Brakke Grond, Amsterdam (2015); Debate center Arminius, Rotterdam (2016) |
| 2014-2017 | Co-initiator and co-organizer monthly Science Lunch Arkin, Amsterdam |

# Publications in this thesis

de Waal, M. M.**,** Dekker, J. J. M., Goudriaan, A. E. (2017). Prevalence of victimization in patients with dual diagnosis. *Journal of Dual Diagnosis, 13*(2), 119-123. (chapter 2)

de Waal, M. M., Dekker, J. J. M., Kikkert, M. J., Kleinhesselink, M. D., Goudriaan, A. E. (2017). Gender differences in characteristics of physical and sexual victimization in patients with dual diagnosis: a cross-sectional study. *BMC Psychiatry, 17*(1):270. (chapter 3)

de Waal, M. M., Christ, C., Dekker, J. J. M., Kikkert, M. J., Lommerse, N. M., van den Brink, W., Goudriaan, A. E. (2018). Factors associated with victimization in dual diagnosis patients. *Journal Substance Abuse Treatment, 84*, 68-77. (chapter 4)

Eggink, E.*, de Waal, M. M.*, Goudriaan, A. E. (2019). Criminal offending and associated factors in dual diagnosis patients. *Psychiatry Research, 273*, 355-362. (chapter 5)

de Waal, M. M., Kikkert, M. J., Blankers, M., Dekker, J. J. M., Goudriaan, A. E. (2015). Self-wise, Other-wise, Streetwise (SOS) training: a novel intervention to reduce victimization in dual diagnosis psychiatric patients with substance use disorders: protocol for a randomized controlled trial. *BMC Psychiatry, 15*(1):267. (chapter 6)

de Waal, M. M., Dekker, J. J. M., Kikkert, M. J., Christ, C., Chmielewska, J., Staats, M. W. M., van den Brink, W., Goudriaan, A. E. (2019). Self-wise, Other-wise, Streetwise (SOS) training, an intervention to prevent victimization in dual diagnosis patients: results from a randomized clinical trial. *Addiction, 114*, 730-740. (chapter 7)

de Waal, M. M.*, Christ, C.*, Messman-Moore, T. L., Dekker, J. J. M. (2019). Changes in risk perception after sexual victimization: are we following the right track? *Journal of Interpersonal Violence*. (chapter 8)

Christ, C.*, de Waal, M. M.*, Dekker, J. J. M., van Kuijk, I., van Schaik, D. J. F., Kikkert, M. J., Goudriaan, A. E., Beekman, A. T. F., Messman-Moore, T. L. (2019). Linking childhood emotional abuse and depressive symptoms: the role of emotion dysregulation and interpersonal problems. *PLOS ONE, 14*(2):e0211882. (chapter 9)

* Authors share first authorship

# Author contributions

Study concept and design:
- Chapter 2-8: all authors
- Chapter 9: de Waal, Christ, Dekker, Messman-Moore

Acquisition, analysis or interpretation of the data:
- Chapter 2-9: all authors

Drafting of the manuscript:
- Chapter 2-4, 6, 7: de Waal
- Chapter 5: Eggink, de Waal
- Chapter 8, 9: de Waal, Christ

Critical revision of the manuscript for important intellectual content:
- Chapter 2-9: all authors

Statistical analysis:
- Chapter 2-4, 6-9: de Waal
- Chapter 5: Eggink, de Waal

Obtained funding:
- Chapter 2-7: Dekker, Goudriaan, Kikkert, Blankers
- Chapter 8-9: de Waal, Christ, Dekker

Administrative technical or material support:
- Chapter 2-7: Goudriaan, Dekker
- Chapter 8-9: Dekker, Messman-Moore

Study supervision:
- Chapter 2-7: Goudriaan, Dekker, Kikkert
- Chapter 8-9: Dekker, Messman-Moore

# Other publications

Christ, C., de Waal, M. M., van Schaik, D. J. F., Kikkert, M. J., Blankers, M., Bockting, C. L. H., Beekman, A. T. F., Dekker, J. J. M. (2018). Prevention of violent revictimization in depressed patients with an add-on internet-based emotion regulation training (iERT): Study protocol for a multicenter randomized controlled trial. *BMC Psychiatry, 18*(1):29.

Frankenmolen, N. L., Altgassen, M., Kessels, R., de Waal, M. M., Hindriksen, J., Verhoeven, B., Fasotti, L., Scheres, A., Kessels, R. P. C., & Oosterman, J. M. (2016). Intelligence moderates the benefits of strategy instructions on memory performance: an adult-lifespan examination. *Aging, neuropsychology, and cognition, 24*(1), 45-61.

Kikkert, M. J., Goudriaan, A.E., de Waal, M. M., Peen, J., Dekker, J. J. M. (2018). Effectiveness of Integrated Dual Diagnosis Treatment (IDDT) in severe mental illness outpatients with a co-occurring substance use disorder. *Journal of Substance Abuse Treatment, 95*, 35-42.

van Hagen, L., de Waal, M. M., Christ, C., Dekker, J. J. M., Goudriaan, A. E. (submitted for publication). Patient characteristics predicting abstinence in substance use disorder patients with comorbid mental disorders.

# Appendices

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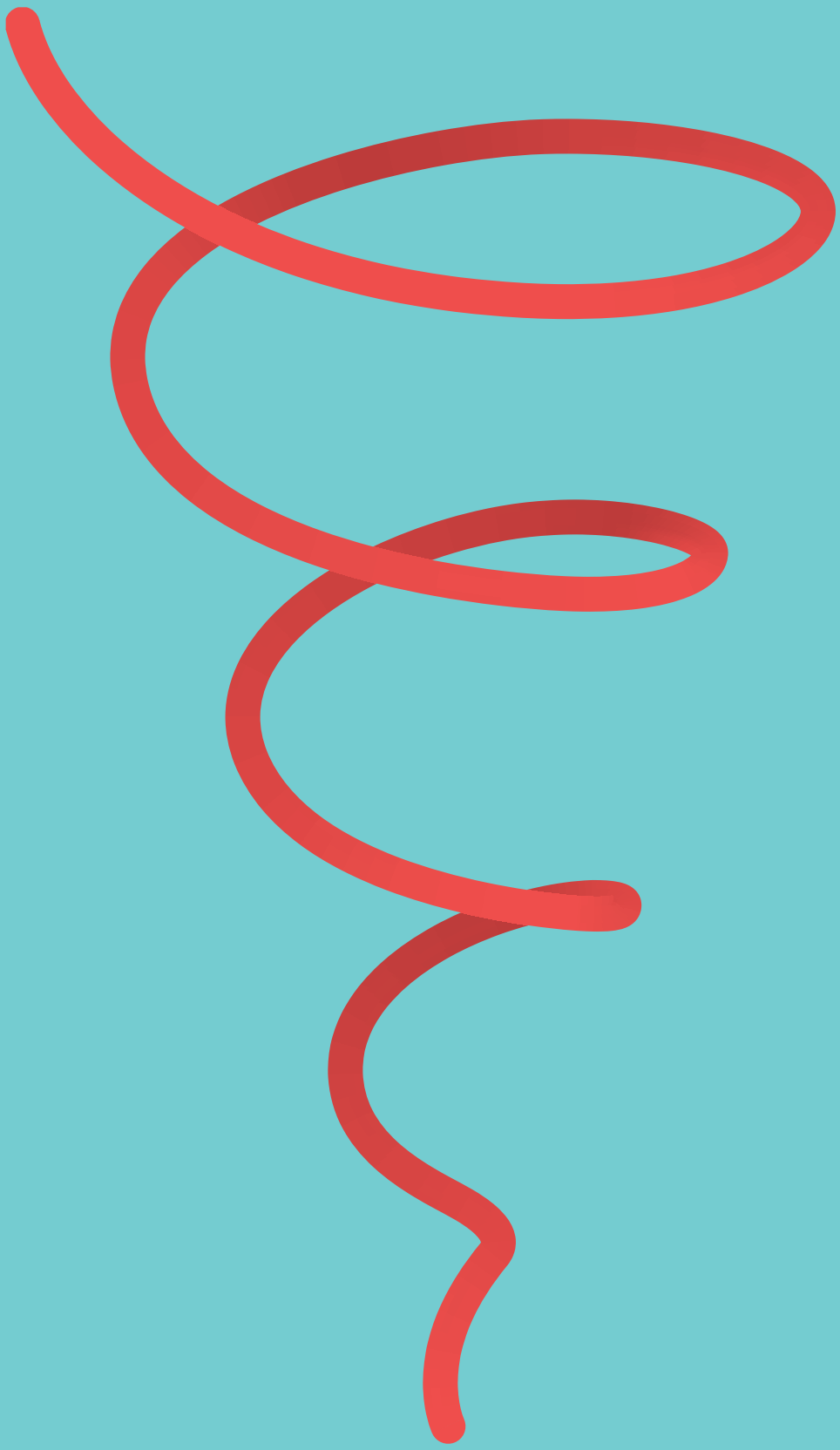
# Appendices

## G. About the author

Marleen de Waal was born on March 14th 1989, in Zwolle, The Netherlands. She completed her secondary education at Carmel College Salland in Raalte, in 2007. After her graduation, she moved to Nijmegen to study psychology at the Radboud University, and developed an interest in both clinical psychology and research methodology. During her studies, she worked as a student-assistant for a research project on sleep disturbances in patients with substance use disorders. She obtained a cum laude master's degree in clinical psychology in 2011.

After graduation, Marleen worked as psychologist at Pro Persona, as mental health practitioner (POH-GGZ) at Zorggroep Almere, and as teacher at the Radboud University Nijmegen. Driven by her intellectual curiosity, she started her PhD-project at the Academic Medical Center of the University of Amsterdam and Arkin in 2013, under supervision of Prof. dr. Anneke Goudriaan, Prof. dr. Jack Dekker, and Dr. Martijn Kikkert, which resulted in the current PhD thesis. Her research was embedded within the dual diagnosis program of Mentrum, part of Arkin. Marleen is passionate about research methodology and statistics and has completed several courses at the Department of Epidemiology & Biostatistics of the VU Medical Center. In 2018, she visited the Trauma and emotion regulation lab of Dr. Terri Messman-Moore at Miami University in Oxford, USA. In the last two years of her PhD-project, Marleen has combined her research activities with a part-time job as a psychologist at Jellinek, addiction care. During this period, she wrote a grant proposal in collaboration with Prof. dr. Arnoud Arntz of the University of Amsterdam, Prof. dr. Anneke Goudriaan, and Dr. Loes Marquenie, and obtained funding for a randomized clinical trial to investigate the effectiveness of different types and timings of post-traumatic stress disorder treatment in patients with co-occurring substance use disorders.

Currently, Marleen is working as a psychologist at Jellinek and as a postdoctoral researcher at Arkin, Amsterdam. She is in training to become a registered cognitive behavioral therapist and prepares to obtain a master's degree in epidemiology. Marleen lives together with Lennart Voerman in Amsterdam. Her non-scientific interests include family and friends, hiking, traveling, rock climbing, card and board games, and reading.