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Predictors of length of stay in forensic psychiatry: the influence of perceived risk of violence

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Abstract

This study describes the prevalence of adverse events and length of stay in forensic psychiatric patients with and without a restriction order. Detailed clinical and administrative information from medical records and written court decisions was gathered retrospectively from admission until discharge for a Swedish population-based, consecutive cohort of forensic psychiatric patients (n=125). The median length of stay for the whole cohort was 951 days, but patients with a restriction order stayed in hospital almost five times as long as patients without. Restriction orders were related to convictions for violent crime, but not for any other differences in demographic or clinical variables. The majority of the patients (60%) were involved in adverse events (violence, threats, substance abuse or absconding) at some time during their treatment. Patients with restriction orders were overrepresented in violent and threat events. Previous contact with child and adolescence psychiatric services, current violent index crime, psychotic disorders, a history of substance, and absconding during treatment predicted longer length of stay. Being a parent, high current Global Assessment of Functioning scores, and mood disorders were all significantly related to earlier discharge. In a stepwise Cox regression analysis current violent index crime and absconding remained risk factors for a longer hospital stay, while a diagnosis of mood disorder was significantly related to shorter lengths of stay.

Keywords: Forensic psychiatry; Length of stay; Risk assessment; Restriction orders; Adverse events

1. Introduction

Approximately 350 persons are court ordered to compulsory forensic psychiatric treatment in Sweden each year, a number that has been fairly stable since the late 1970s (Brottsförebyggande rådet, 2012). However, scientific knowledge of basic treatment conditions and care processes, such as length of stay and the prevalence of adverse events in forensic mental health services, is still scarce. In this article we aim to change this situation by presenting data about the treatment process for a Swedish population-based cohort of forensic psychiatric patients.

Unlike most countries, Sweden sentences mentally disordered offenders to forensic psychiatric care if they suffer from a "severe mental disorder", a medico-legal term most often corresponding to a psychotic or severe mood disorder (Munthe, Radovic, & Anckarsäter, 2010). Patients who are subjected to a forensic psychiatric investigation are also assessed for their risk for recidivism into severe criminality due to their mental disorder; on average 80% are considered to be high-risk patients, far in excess of such rates in other countries (e.g., Crocker & Côte, 2009; Ferguson, Ogloff, & Thomson, 2009; Segal, Daffern, Thomas, & Ferguson, 2010).;. These patients are placed under "special court supervision" (SCS) (Proposition 1990/91:58), which means that they cannot be discharged without court approval. Thus, forensic psychiatry has the contradictory assignment to both treat the patient's psychiatric disorder and protect society (and the patient) from undesired behaviours, often through detention (SOU, 2006:91).

In Sweden the mean length of stay for male patients sentenced to forensic psychiatric treatment *with* SCS has been estimated at 5 years and 9 months, while for those *without* SCS

it was only 1 year 9 months (Socialstyrelsen, 2008). In the same report, patients with a diagnosis of schizophrenia or delusional disorder seemed to have longer hospital stays than those with affective disorders. Differences between the mental health care needs and safety of the clinical care provided to patients *with* and *without* SCS have, however, not been studied.

International comparisons of length of stay in forensic psychiatry are hampered by differences in legislation and health care settings. In addition, different studies often report different measures of length of stay, using either means or medians (e.g. Coid, Kahtan, Gault, Cook, & Jarman, 2001 versus Simpson, Jones, Evans, & McKenna, 2006), which makes them hard to compare. It is also well known that psychiatric care settings tend to have a number of outliers in patients with extremely long hospital stays, which have large effects on reported means.

The main source of information about length of stay and the rate of adverse events (e.g., absconding [i.e. leaving without permission], violence, threats, and substance abuse)in Sweden is the cross-sectional inventory reports published by government agencies. These data collections invariably include data from a concentration of problem-prone, long-term patients, which could lead to flawed conclusions. For example, the rate of criminal recidivism during forensic psychiatric treatment in Sweden was estimated at 28% in one such report (Socialstyrelsen, 2002), a figure considerably higher than that found in a study by Nilsson, Wallinius, Gustavson, Anckarsäter, and Kerekes (2011), in which only 4 % relapsed during ongoing forensic psychiatric treatment.

Among the adverse events that have the most negative effects, aggressive behaviour holds a conspicuous position, potentially causing severe physical or psychological injury to fellow patients, staff, or others, and often resulting in seclusion or transfer to a higher

security ward or another hospital (Blow et al., 1999; Delaney, Cleary, Jordan, & Horsfall, 2001). In a large literature review, Bowers et al. (2011) showed that forensic psychiatric services, report a higher prevalence of violent patients and higher numbers of violent events per patient sample and per admission than acute settings and psychiatric hospitals, , both within and across different countries (although, due to lack of consistency in reporting, it was difficult to compare these findings across separate studies). Few studies report on aggressive behaviors *as adverse events per patient day*, which would be an adequate measure since forensic psychiatry has very long hospital stays. The literature is also inconclusive as to which patients engage in aggressive events. Some studies suggest it is a widespread phenomenon (e.g. Hodgins, Alderton, Cree, Aboud & Mak, 2007), others report that only a small number of patients are involved in the majority of these situations (Daffern, Howells, Ogloff, & Lee, 2005; Kraus & Sheitman, 2004). In a study of patients in a medium secure unit (Gudjonsson, Rabe-Hesketh, & Wilson, 2000) the victims of aggressive behaviours were found primarily to be nursing staff, followed by fellow patients.

Absconding among psychiatric patients is another significant problem associated with both negative effects for the treatment process and potential harm to patients and the general public; the link between absconding and serious harm of self and others is especially strongly supported in the research literature (Muir-Cochrane, & Mosel, 2008). In general psychiatry, the mean rate of absconding has been estimated at 12.6 per 100 patients, with a rather large variation ranging from 2 to44 (Bowers, Jarret, & Clark, 1998). In a study of absconding incidents at a UK psychiatric hospital, Dickens and Campbell (2001) reported that a minority (34 %) of the patients who absconded accounted for almost two thirds of all incidents, with serious adverse outcomes in 16% of all incidents.

Several studies have identified substance abuse as a mediating factor that increases the propensity for violent reactions among people with mental illness (e.g., Elbogen, & Johnson, 2009; Fazel, Gulati, Linsell, Geddes, & Grann, 2009), and as a predictor for aggressive behaviours among psychiatric inpatients (Serper et al., 2005). Substance abuse in combination with medication noncompliance among severely mentally ill individuals has emerged as an especially significant predictor of violent reactions (Swartz et al., 1998). Despite the strong association between substance abuse and violence in patients with major mental disorders, the consequences of relapses into drug abuse during ongoing treatment have rarely been subjected to any empirical studies, and have only occasionally been discussed in papers focusing on the treatment of this "triply troubled" patient group (e.g. Lindqvist, 2007).

The main objective of the present study is to describe the basic conditions of forensic psychiatric treatment in a population-based, epidemiologically representative, total cohort in Sweden over a specified period and to compare conditions for so called high-risk offenders with those for low-risk offenders. To the best of our knowledge, this is the first such endeavour also studying how the occurrence of adverse events affects the length of stay in compulsory forensic psychiatric treatment.

The specific questions were:

1. How long are patients, subjected to involuntary forensic psychiatric treatment, hospitalized and are there any differences in length of treatment between patients with and without a SCS?
2. What is the prevalence of threats, violence, substance abuse, and absconding among these patients and are there significant differences between the groups in the frequency of these events?

3. Which patient characteristics and treatment-related events predict patients´ length of stay?

2. Method

2.1. Participants

We conducted a retrospective file and register study of a population-based total cohort of patients sentenced to forensic psychiatric treatment in the University hospital of Malmoe´s catchment area between 1999 and 2005. The catchment area, which includes the districts of Malmoe, Svedala, Trelleborg, and Vellinge, is demographically representative of Sweden (containing urban, small town, and countryside areas). The total number of inhabitants in the area was around 361 000 at the end of 2005 (Statistiska centralbyrån, 2006). The study clinic had 58 inpatient beds, most of which were occupied by persons living in the catchment area and thus included in the study, And 6 wards with different levels of supervision, reflecting the continuum of care from the initial to the final phases.

Between 1999 and 2005, a total of 127 patients were sentenced to forensic psychiatric treatment, 14 of whom had more than one forensic psychiatric treatment episode. To avoid dependence between the groups that were statistically compared, only one treatment period for each individual (the last, which was also always the longest admission) was included in the present study), except for one patient whose first admission was used because the date of discharge was missing for the second. Two other patients were excluded because their legal conditions differed from those of all the other subjects, making comparisons difficult: one of these patients underwent two forensic psychiatric treatments during the study period and another who was sentenced to forensic psychiatric treatment *without* SCS was re-sentenced to

forensic psychiatric treatment *with* SCS during his initial treatment period. The final study population thus included 125 individuals.

2.3. Procedures

Structured protocols were used to obtain data from medical records and written decisions from district courts, courts of appeal, and county administrative courts, and detailed clinical and administrative information was gathered for the full cohort of patients having a civil register (public records are the basic registration of the population in Sweden). The participants were followed retrospectively from baseline (forensic psychiatric investigation data) and through their inpatient care until discharge or at the latest to June 30, 2008. This date was chosen because in September 2008 new legislation was enacted in Sweden allowing compulsory outpatient care, which would probably have effects on the lengths of stay of forensic psychiatric patients.

2.4. Measures

Baseline data included diagnoses according to DSM-IV Axes I and II (American Psychiatric Association, 1994) and categorized into two groups: forensic psychiatric treatment *without* SCS versus forensic psychiatric treatment *with* SCS. Further variables studied were gender, country of birth, age at psychiatric investigation, previous child and adolescent psychiatric (CAP) contact, previous psychiatric treatment, previous prison sentences, Global Assessment of Functioning (GAF) score, being a parent, and index crimes. Violent crimes were defined as all forms of physical crimes against other persons, namely murder, manslaughter, negligent homicide, assault, violence against an officer, sex crimes, violation of a woman´s integrity, robbery, arson, and creating danger to another. Crimes were included

regardless of the severity of their legal classification, i.e. “slight” (limited), “gross” and/or ”attempted”.

Treatment process data included date of admittance, date of transfer to another ward (when the stay lasted for more than a month), and dates for any treatment periods at other clinics. Dates of adverse events, i.e. absconding from wards/staff, noncompliance with conditions for permission to move freely about or leave the hospital area, withdrawal of such permissions, substance abuse, criminal recidivism, suicide attempts, death, and violence and threats during the hospital stay, were noted. In this context violence was defined as any kind of physical assault (e.g. pushes, punches, and kicks) directed at another person. Threats were verbal abuse perceived by the hearer as threatening. Substance abuse included all registered intakes of alcohol and/or narcotics, such as amphetamines, cannabis, cocaine, and heroin, as measured by breath analyses or urine sampling.

Dates for permission to move freely in the hospital grounds or to leave the hospital area, as well as date of discharge, were also noted for all patients. However, information about the former dates was collected only for eligible for patients treated *with* SCS. Permission to move freely in the hospital grounds allows a patient to go outdoors supervised for about 30-60 min. We also noted whether the permission was granted on condition that a support person or family member was present or if the patient was allowed to use the permission on his or her own. Absconding was defined as either not returning on time from a permission to move freely within or to leave the hospital area or running away from the staff or the ward.

2.5. Ethical considerations

This study was approved by the Regional Ethical Review Board in Lund (64/2007). Because of the study design was register based, the participants were not required to be

informed. It was taken into consideration that it would not be possible to contact most of the subjects since their treatment had finished long ago, and that such contact could also pose risks to vulnerable subjects with mental health and/or legal problems.

2.6. Statistical analyses

The Mann-Whitney U-test for continuous variables and $\chi 2$-test for categorical data were used to evaluate the differences between forensic psychiatric treatment *with* and *without* SCS in terms of several characteristics (e.g. age, sex, diagnosis, index crime, nationality, adverse events and length of stay). Survival analysis (the Kaplan–Meier method) was used to estimate median length of stay and to compare times to discharge between treatments *with* versus *without* SCS (log–rank test). In these analyses we regarded $p<.05$ as a statistically significant level. Finally, a Cox proportional hazards regression analysis with time-dependent covariates was conducted to predict length of stay. The following time independent covariates were considered: age, sex, immigrant status, educational level, marital status, being a parent, employment or studies before conviction, homelessness before conviction, violent index crime, previous CAP contact, age at first sentenced crime, number of earlier prison sentences, number of earlier forensic psychiatric treatment episodes, psychotic disorder, mood disorder, anxiety disorder, substance use disorder, impulse control disorder, neurodevelopmental disorder, personality disorder, and GAF score at forensic psychiatric investigation. We then used the following time dependent variables; suicide attempt, number of suicide attempts, absconding, number of absconding events, substance abuse event, number of substance abuse events, threats or violent events, number of threats or violent events, and reconviction during treatment. In the first step, we established univariate regression models for each covariate separately in order to identify single variables with predictive properties. All covariates with

p<.20 in the univariate analyses were then entered in a stepwise Cox proportional hazards multivariate regression model. In the final model hazard ratios with $p<.05$ and their 95% confidence intervals are presented as measures of relative risk. Statistical analyses were carried out using SPSS version 20.0.

3. Results

3.1. Demographic characteristics

The study group characteristics are shown in Table 1. The most common crime classifications were assault (46 cases, 37 %) and threats (42 cases, 34 %). Of all violent convictions there were 5 murders, 4 attempted murders, 12 arsons, and 10 serious assaults.

There were no significant differences between patients *with* and *without* SCS in age, gender or immigrant status. However, as expected, patients with forensic psychiatric treatment *with* SCS were more often convicted of a violent crime ($p<.001$)

/Table 1 about here/

3.2. Clinical variables

Virtually the whole group (N=122, 98%) had at least one Axis I diagnosis and, as shown in Table 1, psychotic disorders were by far the most common. Six patients had a diagnosis in cluster A personality disorder, 19 had cluster B personality disorder, and 2 had cluster C disorders, and 8 had a personality disorder not otherwise specified. There were no differences between the two groups in terms of these clinical characteristics.

3.3. Treatment process

For the total study group the median length of treatment stay was 951 days (2.61 years) and a Kaplan–Meier analysis (Fig. 1) revealed a significant difference in length of stay between patients sentenced to forensic psychiatric treatment *with* SCS, in whom the median duration of hospital treatment was 1272 days (3.48 years), and those *without*, in whom it was only 273 days (0.75 year) (p<.001).

/Figure 1 about here/

During the study period 89 patients (71 %) left the forensic psychiatric clinic: 82 (66%) were discharged and 7 (6 %) died, 4 (3 %) by suicide. 4 patients (3 %) were deported from the country during the study period, and 4 patients (3 %) who had been sentenced to forensic psychiatric treatment *without* SCS were lost to follow-up for administrative reasons.

Adverse events were noted in 71 patients (60 %), with data missing in 6 cases. During the study period, 8 patients (6 %) had attempted suicide, 3 of them twice. Two patients (2%) were convicted of crimes committed during their treatment and one other was convicted of a crime committed before the study began. Men were significantly more often involved in adverse events than women (87% vs. 13%, p<0.05) and patients belonging to the SCS group were significantly overrepresented in adverse events in general (p< 0.05), and more particularly in threats (p< 0.05) and violence (p< 0.05), but not in absconding or substance abuse.

In the 48 patients (40 %) with no adverse events, the median length of stay was 471 days (1.29 years), whereas for the 71 patients with adverse events the median length of stay was 1206 days (3.3 years) ($p\leq$ 0.001).

As shown in Table 2, 624 adverse events were noted in the entire study group. Of these 46 patients (39%) were responsible for the 154 occasions of absconding; 112 (73 %) of these incidents occurred when the patients had permission to move about unaccompanied in the hospital grounds or to leave the hospital area, and 35 (23 %) involved running away from staff members or wards. (For 7 incidents of absconding, information about the type, late return or running away, was not available). The number of absconding events differed significantly ($p< 0.05$) between the groups *with* and *without* SCS.

Substance abuse was registered on a total of 307 occasions: 203 (66 %) involved narcotics and 104 (34 %) alcohol. Fifty-four patients (45 %) were registered for substance abuse at least once during the hospital stay and there was no significant difference between those *with* or *without* SCS in this respect. Violence or threats were registered on a total of 155 occasions. Thirty-five patients (29 %) were registered for violent or threatening behaviour at least once during the hospital stay, and both these types of adverse events were significantly overrepresented in the SCS group ($p< 0.05$). Of these 155 occasions 103 were threats, 95 of which occurred in the group *with* SCS (74% against staff members) and 8 in the group *without* SCS. Fifty-two violent incidents 52 such events were observed, 49 in the group *with* SCS (56% against fellow patients), and only 3 in the group *without* SCS.

/Table 2 about here/

Although the SCS group was overrepresented in incidents of threats, violence, and adverse events in general, when controlling for length of stay by dividing the number of adverse events by the number of days in treatment, only the combined number of threats or violent events remained as a significant difference between the two groups ($p\leq 0.01$). (See Table 3.)

/Table 3 about here/

3.4. Time to temporary leaves of absence

The median treatment times before the first permissions to move freely in the hospital grounds or to leave the hospital area were analysed separately and only for patients *with* SCS, since only these patients were subject to court decisions regulating their treatment. After a median treatment time of 93 days 71 patients (88 %; 3 cases missing data) in the group *with* SCS were granted permission to move freely about the hospital grounds. Permission to leave the hospital area was granted for 74 patients (90%; 2 cases missing data) after a median time of 155 days. Men were allowed permission to leave the hospital area earlier than women (median 138 days for men and 239 days for women; $p< 0.05$), but there was no differences in wait time for permission to move freely within the hospital grounds. Patients born outside Sweden had permission to move freely in the hospital area earlier than native Swedish patients (median 76 days for those born outside Sweden and 120 days for those born in Sweden; $p< 0.05$). No significant effects were found for type of index crime, substance abuse, or personality disorders.

3.5. Prediction of length of treatment

Predictors of length of stay or discharge were first sought among the variables listed in Table 4 by univariate analyses. In this table, hazard ratios smaller than "1" suggest lower chance of discharge, i.e. longer length of stay, and values larger than "1" higher chance of discharge and shorter length of stay. Among the demographic and background variables, previous CAP was associated with a longer treatment period, while being a parent was associated with a shorter length of stay. Among the crime-related variables, current conviction

for a violent index crime had an inverse relationship to discharge. Among the clinical factors, a higher GAF score at the time of the investigation was associated with a shorter length of stay, as was a diagnosis of mood disorder. A psychotic disorder or a history of substance abuse was associated with a decreased chance of being discharged. Among the time-dependent variables, only absconding was significantly associated with discharge, and for those patients the hospital stay was prolonged.

Finally, a stepwise Cox regression, based on the variables that had been significantly linked to discharge in the univariate analyses, was used to identify the strongest predictive model. Absconding events and current conviction of a violent index crime emerged as significant risk factors for a longer hospital stay, while a diagnosis of mood disorder was significantly related to shorter lengths of stay in the final model.

/Table 4 about here/

4. Discussion

By using a population-based total cohort of patients sentenced to forensic psychiatric treatment in a representative catchment area, this study allowed us to present key data for patients sentenced to forensic psychiatric care in Sweden. The median length of stay in this study group was just above 2.5 years (951 days). This is much shorter than lengths of stay in earlier reports from Swedish government agencies (e.g. Socialstyrelsen, 2008), but it is important to note that those earlier studies presented cross sectional data, in which mean length of stay could have been inflated by a concentration of long term patients.

In the present study, the difference in mean length of stay between patients sentenced to forensic psychiatric treatment *with* and *without SCS* was considerable; 3 years 6 months for

those *with* SCS versus a mere 9 months for those *without*. A recent study of the impact of movement restrictions on time to discharge (Brown, & Fahy, 2009) showed that median hospital stays almost doubled in the restriction group, which the authors discussed in terms of the groups more serious criminal acts and higher level of complexity and risk involved in their care.

Since mental health care needs were about equal in our two study groups,, or sometimes even higher among those without SCS, the median difference in hospital stay of 2 years 3 months more for those with SCS indicates that the hospital system assumes a longer treatment period for sentenced patients appropriate for the sole reason of crime prevention. The economic impact of this extended stay for patients *with* SCS is borne by other psychiatric patients and other persons in need of health care. When the legislation was introduced in 1992, SCS was not part of forensic psychiatric care, but was introduced a few years later, largely in response to a few highly publicised cases with appallingly short treatment times. Since then, treatment times have become increasingly prolonged, with no influence from economists or legal authorities. It is also important to recognise that excess treatment periods may be assumed to violate the Declaration of Hawaii, which states that psychiatric care must not be given in the absence of psychiatric illness (World Psychiatric Association, 1977).

The present study is also rare in presenting detailed data about the treatment processes of forensic psychiatric patients. The frequency of adverse events might be seen as low, with an average of only one event per patient every 200 day; however, almost two thirds of all patients (60%) had at least one such event during their hospital stay, which must be considered a failure in terms of the provision of secure health care. These finding also contrast with those of previous studies that found a small minority of patients responsible for the

majority of violent incidents (e.g. Daffern et al., 2005). Possibly, these results could in part be due to the fact that a small number of "difficult patients", some of whom had a high risk of reoffending were transferred to a high security regional clinic. Patients *with* a SCS were overrepresented in our study in adverse events, and violence and threats especially were more common in this group, even when controlling for length of stay. This could imply that these patients indeed have traits that make them more prone to violent behaviour. However, it cannot be ruled out that these differences reflect situational factors to some extent, for example these patients may experience more frustration than others because of the restrictions imposed upon them.

Many factors are known to influence length of stay on general psychiatric wards (Creed, Tomenson, Anthony, & Tramner, 1997). The chronicity of a patient's illness, his or her premorbid functioning, socio-economic status, and current level of functioning have recurrently been related to the course of treatment, length of stay, and institutional outcome in psychiatric care (Paul, & Menditto, 1992). In forensic psychiatric care an additional dimension that affects the treatment process has been added in the form of risk management, which aims to protect patients from destructive and violent behaviours. In the current Swedish legislation, this is seen in the statutes stating that forensic psychiatric patients must not be discharged from the hospital if judged to "constitute a risk" to themselves or others. The estimated risk of relapse in serious criminality is thus the dividing line between patients' sentences to treatment with and without a SCS. In practice, the nature of the index crime has been shown to play a major role in these risk assessments (Nilsson, Munthe, Gustavson, Forsman, & Anckarsäter, 2009), and therefore we were not surprised to find violent index crime one of the strongest risk factors for long hospital stay in this study. On the other hand,

the fact that absconding was the only risk incident or adverse event significantly linked to longer hospital stay was surprising. One reason for this could be that the frequency of other incidents or adverse events was too low to reach significance, even though all adverse events, except number of suicide attempts, tended to have a positive relationship to length of stay (i.e. they increased with the treatment period). A strong focus on risk management might in itself also contribute to reduced levels of incidents, a notion supported by earlier studies of aggressive behavior in forensic psychiatry (e.g. Fluttert, van Meijel, Nijman, Björkly, & Grypdonck, 2010) in which prevention of aggression among patients resulted in positive consequences, such as a decrease in seclusion and less severe incidents.

However, our findings do agree to some extent with previous findings from general psychiatry. Patients in our study with a long history of psychiatric and adaptive problems (i.e. those who had CAP contact as children) were less likely to be discharged, as were patients with psychotic disorder (most often chronic schizophrenia), a low GAF score, and/or several prior forensic psychiatric treatments. Substance, a condition known to worsen the treatability and outcome of other psychiatric disorders, also emerged as a predictor of long stays. On the other hand, patients with children had significantly shorter lengths of stay. Educational level also had a positive association with discharge, although it did not reach significance.

In the multivariate risk model being convicted of a violent index crime emerged as the strongest risk factor for longer lengths of stay. Among the clinical disorders, psychosis did not emerge as a significant predictor, whereas mood disorder did emerge as a factor related to shorter stays. This result is most likely the effect of these two disorders being mutually exclusive in terms of Axel 1 disorders; hence the replication of the well-established finding that patients with psychotic disorders have longer hospital stays in psychiatric settings than

patients with mood disorders. Finally, the emergence of absconding, as strongly related to longer treatment periods probably signals a deep-felt discomfort with and distrust of treatment facilities, combined with a lack of treatment alliance among those with repeated absconding.

4.1. Limitations

There are several limitations to this study. There is a possibility of selection or sample bias in this cohort due, for example, to differences between individual Swedish courts in the offenders they send for forensic psychiatric examination. However, our study group was selected from a representative part of the Swedish forensic psychiatric patient population, since all offenders from the south of Sweden sentenced to forensic psychiatric treatment, were transferred to the clinic in Malmö. Among these patients, the catchment area sampling method was chosen to reflect the general demographic structure in Sweden. The design, based on the retrospective analysis of records, has been associated with limitations due to differences in record-keeping systems and extended records that may be difficult to grasp and the psychiatrists' medical records were frequently based on second-hand information. In addition, records of adverse events do not necessarily reflect all true incidents since some cases of substance abuse, for example, may not be noticed. The size of the sample is another limitation, especially in terms of studying interactions between variables. There are also differences between the diagnostic procedures in a forensic psychiatric investigation, conducted by a team during a 4- to 6- week observation, and a forensic psychiatric screening report, in which patients are assessed by a forensic psychiatrist after a single appointment, and this could have affected the quality of our descriptive diagnostic data.

4.2. Summary and implications for the field of forensic psychiatry

The results of this study indicate rather strongly that violent index criminality, absconding, and previous psychiatric treatment history are important factors associated with length of stay in forensic psychiatric treatment, while clinical diagnosis and thus present mental health care needs are only weakly related to length of treatment. These findings have two major implications: First, the fact that almost all adverse events were associated with a delayed discharge highlights the importance of a systematic and evidence-based strategy to prevent these incidences. In particular, there is a need to further develop methods to increase treatment alliances within all health care services providing involuntary treatment, and these identified variables must be included in our definition of an evidence-based practice. Lessons may also be drawn from other areas where treatment is coerced or mandated. Second, the weak relationship between the patients' clinical psychiatric needs and their lengths of stay puts forensic psychiatry in Sweden in a serious ethical dilemma: To what extent should forensic psychiatric treatment be directed towards caring for and seeking to cure a mentally disordered offender's health problems? And to what extent should it be guided by protective obligations that may lead to the prolonged detention of a mentally disordered offenders assumed to be dangerous and prone to relapse into serious criminality? Given the growing evidence that risk assessments of mental patients tend to overestimate their danger to others and themselves (Large, Ryan, Singh, Paton, & Nielssen, 2011), this double-sided question emerges as primary demand that should call representatives of the profession, policy makers, and politicians to find a sound and ethically justifiable policy for future forensic psychiatric treatment.

Conflict of interest

The authors declare that they have no conflict of interest

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Table 1. Characteristics of patients and comparison of patients with and without SCS

Variables	With SCS (N=84, 67%)	Without SCS (N=41, 33%)	Total (N=125)
Demographic data			
Age, median (range)	37 (17-79)	40 (24-62)	38 (17-79)
Female sex, n (%)	13 (16)	11 (27)	24 (19)
Immigrant status, n (%)	30 (36)	17 (41)	47 (38)
Being a parent	32 (43) *	23 (64) *	55 (50)
Highest educational level completed			
<Compulsory school (ages 7-16 yrs), n (%)	8 (10)	4 (11)	12 (10)
Compulsory school (ages 7-16 yrs), n (%)	47 (59)	17 (47)	64 (55)
Upper secondary school (16-19 yrs), n (%)	20 (25)	13 (36)	33 (28)
Higher education [a], n (%)	5 (6)	2 (6)	7 (6)
Homelessness, n (%)	21 (25)	9 (23)	30 (24)
Violent index crime, n (%)	68 (81) ***	18 (46) ***	86 (70)
Admission-specific variables			
Previous CAP contact, n (%)	29 (36)	5 (19)	34 (32)
Age at first sentenced crime (median, range)	26 (15-78) *	31 (15-54) *	27 (15-78)
Previous prison sentence, n (%)	27 (33)	8 (25)	35 (31)
Previous FPT, n (%)	22 (27)	9 (24)	31 (26)

Clinical characteristics			
Current GAF (median, range)	35 (10-65)	35 (24-51)	35 (10-65)
Psychotic disorder, n (%)	62 (74)	29 (71)	91 (73)
Mood disorder, n (%)	9 (11)	6 (15)	15 (12)
Anxiety disorder, n (%)	8 (10)	3 (7)	11 (9)
Impulse control disorders	3 (4)	1 (2)	4 (3)
Neurodevelopmental disorders	7 (8)	4 (10)	11 (9)
n (%)	56 (67)	23 (56)	
Personality disorder, n (%)	21 (25)	11 (27)	32 (26)
Treatment process			
Patients involved in adverse events, n (%)	54 (66) *	17 (46) *	71 (60)
Threats, n (%)	28 (34) *	5 (14)*	33 (28)
Violent incidents, n (%)	16 (20)*	2 (5)*	18 (15)
Absconding, n (%)	36 (44)	10 (27)	46 (39)
Substance abuse, n (%)	39 (48)	15 (41)	54 (45)

Abbreviations: SCS= special court supervision, FPT=forensic psychiatric treatment, CAP=child and adolescence psychiatry

[a] Higher education includes university college and university

*** $p<0.001$, ** $p<0.01$ * $p<0.05$.

Table 2. Comparison of number of negative events between patients with and without SCS

Variables	With SCS N=82			Without SCS N=37			Total N=119		
	Total	Median	Range	Total	Median	Range	Total	Median	Range
All events	528	2	(0-48)	112	0*	0-35	624	2	0-48
Absconding	123	0	0-18	31	0*	0-10	154	0	0-18
Substance abuse	239	0	0-25	68	0	0-24	307	0	0-25
Threats	95	0	0-20	8	0*	0-4	103	0	0-20
Violence	49	0	0-8	3	0*	0-2	52	0	0-8
New convictions	3	0	0-1	0	0	0	3	0	0-1
Attempted suicides	10	0	0-2	1	0	0-1	11	0	0-2

*** $p<0.001$, ** $p<0.01$ * $p<0.05$.

Table 3. The distribution of negative events per 100 treatment days

Variables	Total N=119 Mean±SD	With SCS N=82 Mean±SD	Without SCS N=37 Mean±SD	Group comparison P
All negative events	0.483±0.654	0.481±0.576	0.490±0.808	0.218
Absconding	0.122±0.230	0.122±0.204	0.122±0.284	0.158
Substance abuse	0.253±0.406	0.224±0.349	0.316±0.508	0.992
Threats or violent events	0.104±0.219	0.128±0.215	0.049±0.221	0.007

Table 4. Predictors of length of stay in univariate analyses and in the Cox proportional hazard stepwise model.

	Cox proportional univariate hazard ratios		Cox regression, stepwise	
	Hazard ratio (95% CI)	p-value	Hazard ratio (95% CI)	p-value
Demographic data				
Age	1.01 (0.99:1.03)	0.2974		
Female sex	1.41 (0.84:2.37)	0.1947		
Immigrant status	0.99 (0.65:1.49)	0.9444		
Educational level	1.27 (0.93:1.74)	0.1252		
Married or cohabitant before conviction	1.42 (0.88:2.30)	0.1516		
Being a parent	1.95 (1.25:3.05)	0.0031		
Employment or studies before conviction	1.37 (0.63:2.98)	0.4279		
Homelessness	1.02 (0.67:1.55)	0.9379		
Violent index crime	0.58 (0.37:0.90)	0.0162	0.55 (0.35: 0.87)	0.0098
Admission-specific variables				
Previous CAP contact	0.59 (0.36:0.97)	0.0387		
Age at first sentenced crime	1.01 (1.00:1.03)	0.1316		
Number of earlier prison sentences	1.00 (0.99:1.01)	0.6249		
Number of earlier forensic psychiatric treatment episodes	0.99 (0.97:1.00)	0.0494		
Clinical variables				
Current GAF	1.04 (1.01:1.07)	0.0166		
Psychotic disorder	0.51	0.0037		

	(0.33:0.81)			
Mood disorder	2.56	0.0018	2.47	0.0025
	(1.42:4.60)		(1.37:4.44)	
Anxiety disorder	1.41	0.2862		
	(0.75:2.66)			
Impulse control	2.64	0.0622		
disorder	(0.95:7.32)			
Neurodevelopmental	0.91	0.8062		
disorder	(0.44:1.89)			
	0.57	0.0096		
	(0.37:0.87)			
Personality disorder	1.38	0.1910		
	(0.85:2.22)			
Time dependent variables				
Suicide attempt 0/1	0.87	0.8918		
	(0.12:6.43)			
Number of suicide	1.02	0.9251		
attempts	(0.73:1.41)			
Absconding event 0/1	0.60	0.0373	0.57	0.0211
	(0.37:0.97)		(0.35:0.92)	
Number of	0.92	0.2696		
absconding events	(0.79:1.07)			
Substance abuse event	0.73	0.1681		
0/1	(0.46:1.14)			
Number of substance	0.96	0.1940		
abuse events	(0.89:1.02)			
Threats or violent	0.63	0.0852		
events 0/1	(0.38:1.07)			
Number of threats or	0.89	0.0822		
violent events	(0.77:1.02)			
Reconviction during	0.26	0.1869		
treatment 0/1	(0.04:1.90)			

Figure 1. Length of stay for patients with and without SCS