Eur. J. Psychiat. 2021;35(1):24–32

THE EUROPEAN JOURNAL OF PSYCHIATRY

www.elsevier.es/ejpsy

ORIGINAL ARTICLE

Prevalence and risk factors for seclusion and restraint at Geneva's adult psychiatric hospital in 2017

M. Chieze[a,*], D. Courvoisier[b], S. Kaiser[a], A. Wullschleger[a], S. Hurst[c], A. Bardet-Blochet[a], A. Ourahmoune[b], O. Sentissi[a]

[a] *Adult Psychiatry Division, Department of Psychiatry, University Hospital of Geneva, Geneva, Switzerland*
[b] *Quality of Care Service, University Hospital of Geneva, Geneva, Switzerland*
[c] *Institute for Ethics, History and the Humanities, Faculty of Medicine, University of Geneva, Geneva, Switzerland*

Received 6 February 2020; accepted 22 June 2020
Available online 14 August 2020

KEYWORDS
Coercion;
Restraint;
Seclusion;
Adult psychiatry;
Risk factors

Abstract
Background and objectives: Coercion is frequent in psychiatry, with an overall downward trend. Knowledge on the application of seclusion and restraint in open wards remains limited. We aimed to describe the prevalence of coercion in an open inpatient setting and identify risk factors for it.
Methods: We conducted a retrospective analysis of the use of seclusion and restraint in 2017 in the adult psychiatry division of Geneva University Hospital. To identify risk factors for coercion, we estimated incidence rate ratios using multivariable Poisson regressions.
Results: Of 865 patients, 142 (16.4%) experienced at least one coercive measure (mostly seclusion). The incidence of coercion was higher in men, single patients, patients with psychotic or bipolar disorders, patients receiving disability benefits, patients with a higher number of previous psychiatric hospitalizations, and patients with higher global scores and higher scores on item 1 (overactive, aggressive or agitated behaviour) on Health of the Nation Outcome Scales (HoNOS) at admission. Age and referrals from the emergency department were not associated with a higher risk of coercion.
Conclusion: Risk factors for coercion were being male, being single, having psychotic or bipolar disorders, having previous psychiatric hospitalizations, having high HoNOS scores at admission, and being referred from outpatient centres or private physicians. Ratings on the first HoNOS item at admission might be sufficient for a pertinent aggression risk evaluation and thus for the prevention of coercion due to violence. This study is the first to analyse the risks of seclusion in open wards and calls for further research.

Abbreviations: CI, confidence intervals; HoNOS, Health of the Nation Outcome Scales; IQR, interquartile range; IRR, incidence rate ratio; No., number; PAFA, Placement à des Fins d'Assistance; vs, versus.

* Corresponding author at: University Hospital of Geneva, Department of Psychiatry, Adult Psychiatry Division, Chemin du Petit-Bel-Air 2, 1226 Thônex, Switzerland.
E-mail address: marie.chieze@hcuge.ch (M. Chieze).

https://doi.org/10.1016/j.ejpsy.2020.06.006

Introduction

The use of coercion in psychiatric settings is a worldwide phenomenon and refers to an action overriding a patient's will,[1] usually to prevent aggression and violence.[2,3] As coercive measures limit patients' liberty of movement and choice—thus violating their basic human rights—and given the vulnerability of patients suffering from mental illness, the use of coercive measures in psychiatry is especially controversial and raises ethical and legal questions.[4,5]

Coercion is a complex concept with heterogeneous definitions varying among countries and according to legislation.[4,5] Formal coercion pertains to involuntary admission, forced medication, seclusion and restraint.[5] The present study focuses mainly on seclusion and restraint. Seclusion refers to the containment of a patient in a closed room that he/she cannot exit freely.[1] Restraint designates either physical or mechanical immobilization.[1] The spectrum of coercion also includes informal coercion, which describes interventions aiming to influence a patient's choice,[5,6] and subjective coercion, which designates the perception of the level of coercion.[7]

International efforts are carried out to reduce the use of coercive measures in psychiatric settings.[8–11] With respect to seclusion and restraint, the limitation of the frequency and duration of these interventions is an important goal. In Switzerland, the National Commission for the Prevention of Torture strongly recommends limiting seclusion of more than 24 h to highly exceptional cases.[12]

The reduction of coercive measures requires the identification of risk factors. The EUNOMIA multicentre project showed different types of risk factors, namely, patient-, staff- and institution-related risk factors.[13] Psychotic and bipolar disorders (manic episodes), symptom severity and highly aggressive behaviours were shown to be the main patient-related risk factors for coercive measures.[13,14] Young men from a foreign country also seem to be at higher risk for restraint during psychiatric hospitalization.[15] However, the studies report inconsistent results that are mostly very difficult to compare because of broad methodical heterogeneity.[13,14] There is currently no recent systematic review available on risk factors for coercion. Furthermore, most studies focus on general or adult psychiatric populations and do not address the particular situation of other psychiatric settings, such as geriatric psychiatry.

Among the structural risk factors identified in the literature, the specific contribution of open-door policies on the use of coercive measures has been the subject of a recent systematic literature review.[16] In this work, the authors aimed to analyse the efficiency, adverse effects, and consequences of the use of coercive measures in psychiatric hospitals with open-door policies. A decrease in the use of coercion in hospitals implementing an open-door policy seemed to be a general trend. However, a conclusion could not be stated due to methodological aspects with high risks of bias, and the authors underlined the need to conduct high-quality prospective studies to assess the significant relation between open-door policies and decreases in coercion. To our knowledge, no study to date has specifically analysed patient-related risk factors influencing the use of coercive measures in the context of psychiatric wards with an open-door policy.

The aim of the present study is first to identify risk factors for coercion following the determination of the sociodemographic and clinical characteristics of coerced patients. This should aid in the development of tailored interventions for patients at risk of coercion. Second, we aim to describe the prevalence of the use of coercion in an open-door setting. Such an objective should be of interest to enhance comparability among different hospitals with open-door policies aiming to reduce the use of seclusion.

Material and methods

Participant selection

The study follows a retrospective design. Data regarding sociodemographic and clinical patient characteristics, hospital stays, and the use of coercion were extracted from the electronic patient files and anonymized.

Every patient hospitalized in the adult psychiatry division of Geneva University Hospitals between 1 January and 31 December 2017 was included. Patients admitted before 1 January or discharged after 31 December 2017 were included as well.

In this division, six wards provide inpatient treatment for patients aged between 18 and 65 years. These wards follow an open-ward policy, with the main ward door being open without interruption between 7 am and 11 pm, without surveillance of the ward exits. From 11 pm to 7 am, doors can be opened upon request. Three of the wards receive patients for acute care, and the other three for post-acute care. When coercion is needed, the division's policy recommends the use of seclusion and forced medication rather than restraint, which is reserved for highly exceptional situations.

Data collection

Since 1 January 2017, the prescriptions of coercive measures—defined as seclusion, restraint (five-point belts, immobilization, waist-belts, ankles and wrists fasteners, bed-rails) or other (forced medication, holding)—have been directly entered into the patients' general health records. The number of experienced coercive measures was thus automatically extracted from these electronic records. Emergency forced medication was not differentiated from forced medication under Article 434 of the Swiss Civil Code (given when failure to treat seriously jeopardizes the health of the patient or the life or bodily integrity of others).[17] The experience of at least one coercive measure was set as the principal (dependent) outcome variable. We chose to assign situations in which both seclusion and restraint were used for the restraint category, as the latter is often regarded as more coercive and more traumatic than seclusion alone.[18–20] We regarded the use of mutually exclusive categories as more significant for statistical analysis. Studying the combination of coercive measures was another possibility, also recommended by some authors,[21] but restraint did not recur sufficiently to permit combined analyses.

Data were not independent, as the same patient could be hospitalized more than once during the year and experience more than one coercive measure during the same

stay. Therefore, we differentiated the variables regarding the level they characterized: either the patient or hospital stay.

Patient-related variables included gender, age, civil status (single, married living as a couple, married and living separately, divorced, widowed), disability benefits (yes/no), nationality (Swiss/foreign), number of previous stays during the year (1, 2, 3 and more), and existence (yes/no) and number of previous psychiatric hospitalizations. Variables regarding the index hospital stay include the origin of the hospitalization decision (outpatient centre or private physician practising outside of the hospital, hospital physician, emergency department, forensic institution, other), main diagnosis (depressive (F32−33[22], psychotic (F2), bipolar (F30−31), personality (F6), anxious and behavioural disorders (F4–F5), substance use (F1), other diagnoses (organic (F0), developmental (F7–F8–F9) and other), number of days spent in the hospital in 2017, admission status (voluntary, involuntary, without distinction between a physician- or court-ordered commitment). We analysed the Health of the Nation Outcome Scales (HoNOS) scores at admission and discharge. This 12-item scale is rated by physicians in Swiss institutions to evaluate the severity of the symptoms and the impact of disease on the mental and social functioning of patients.[23,24] Each item is rated with a 5-grade intensity scale (no problem, minor, mild, moderately severe, severe to very severe problems). The first item of the scale specifically assesses the symptoms of aggression by rating any overactive, aggressive, disruptive or agitated behaviour. We specifically analysed this item to evaluate the risk for coercion in cases of aggression at admission and discharge.

Data analysis

For descriptive analyses, we assumed a non-normal distribution for quantitative variables and used a Kruskal–Wallis rank-sum test. For qualitative variables, in the case of expected frequencies higher than five, Pearson's chi-square test was used, and Fisher's exact test was used otherwise.

To analyse risk factors for coercion, we performed multivariable Poisson regression using generalized linear models that did not account for repeated measures. Missing data were taken into account by means of multiple imputations with chained equations. The global incidence rate (IR) indicated the number of days of hospitalization comprising at least one coercive measure out of 365 days of hospitalization. Incidence rate ratios (IRRs) (or rate of coercive measures per time period) were calculated with the relevant variables of the descriptive analyses. IRRs significantly higher than one suggested an increased risk of coercion in the exposed group, and IRRs lower than one suggested a reduced risk. For the multivariable analyses, we chose not to keep non-pertinent or potentially confounding variables (HoNOS scores at discharge, number of previous stays during the year, existence of previous psychiatric hospitalizations, nationality).

Statistical analyses were performed with RStudio version 1.2.1335. Statistical significance was considered at p values <0.05.

Human participant protection

The study protocol was accepted by the Swiss Ethics Committee on research involving humans of Geneva (N°2018-00988).

Results

Descriptive analyses (Table 1)

In 2017, of 865 patients hospitalized in the adult psychiatric unit, 142 (16.4%) experienced at least one coercive measure during their stay. These coercive measures occurred during 251 hospital stays (17.9%) of the 1405 hospital stays. Among the latter, 228 (90.8%) had at least one prescription of seclusion, 7 (2.8%) had at least one prescription of restraint, and 16 (6.4%) had at least one forced medication or other prescription.

Patients who did or did not experience coercive measures did not differ significantly regarding the chosen variables, except for the total time spent in the hospital in 2017, which was longer for patients experiencing coercion (median 34.56 days, interquartile range (IQR) [17.51, 109.28] vs 16.89 [7.86, 36.96], $p < 0.001$). The origin of the hospitalization decision was significantly different between stays with or without coercion. Hospital stays during which coercive measures occurred were more frequently initiated by the emergency room (143 (57.0%) vs 447 (41.4%), $p < 0.001$). For stays during which no coercive measures occurred, hospitalization was mostly decided by an outpatient physician (552 (48.0%) vs 91 (36.3%), $p < 0.001$).

The main diagnosis was significantly different between stays with or without coercion: psychotic disorders were more frequent for stays during which coercion took place (112 (53.3%) vs 383 (35.1%), $p < 0.001$). It was the most represented disorder in both categories. There were more involuntary admissions for stays with coercion (179 (71.3%) vs 332 (28.8%), $p < 0.001$), and the duration of stay was longer (median 27.57 days, IQR [16.93, 61.36] vs 10.25 [4.85, 20.79], $p < 0.001$). Global HoNOS scores at admission and item 1 HoNOS scores at admission and discharge were higher for stays with coercion (admission global scores: median 24, IQR [18, 29] vs 19 [14, 24], $p < 0.001$; admission item 1: 3 [2, 4] vs 1 [0, 2], $p < 0.001$; and discharge item 1: 0 [0, 1] vs 0 [0, 0], $p < 0.001$).

Multivariable analyses

The global IR is 26.8 per hospital stay-year, indicating that out of 365 days of hospitalization, 26.8 have a prescription of coercion (95% CI [25.9, 27.8]).

Demographic risk factors

Adjusted for the other variables, the incidence of coercion was significantly higher in men (IRR 1.09 [1.03, 1.21], $p = 0.039$) (Table 2). Age was not significantly associated with the risk of coercion ($p = 0.15$). A reduced risk of coercion was observed in patients who were married (living as a couple or separately) or divorced than in those who were single (IRR 0.67 [0.62, 0.82], $p < 0.001$; 0.44 [0.38,

Table 1 Descriptive analyses.

	No coercion	Coercion	Test	p-Value
Patient-related variables				
N = 865 (%)	723 (83.6)	142 (16.4)		
Gender = male (%)	389 (53.8)	71 (50.0)	0.55[a]	0.46
Age (year) (median [IQR])	44.00 [34.00, 51.00]	43.00 [33.00, 50.75]	0.42[b]	0.52
Civil status (%)			Fisher[c]	0.36
Single	355 (49.4)	75 (52.8)		
Married living as a couple	177 (24.6)	27 (19.0)		
Married living separately	35 (4.9)	5 (3.5)		
Divorced	148 (20.6)	33 (23.2)		
Widowed	4 (0.6)	2 (1.4)		
Nationality = Swiss (%)	380 (52.6)	84 (59.2)	1.82[a]	0.18
Disability benefits = yes (%)	62 (8.6)	14 (9.9)	0.11[a]	0.74
No. of hospital stays in 2017 (%)			4.72[a]	0.094
1	500 (69.2)	111 (78.2)		
2	123 (17.0)	18 (12.7)		
3+	100 (13.8)	13 (9.2)		
Total no. of psychiatric hospitalizations (median [IQR])	1.00 [0.00, 5.00]	2.00 [0.00, 5.00]	0.37[b]	0.54
Previous psychiatric hospitalization = yes (%)	475 (65.7)	93 (65.5)	2.12 e-29[a]	1.00
Total hospitalization duration in 2017 (days) (median [IQR])	16.89 [7.86, 36.96]	34.56 [17.51, 109.28]	**45.5**[b]	**<0.001**
Hospital stay-related variables				
N = 1405 (%)	1154 (82.1)	251 (17.9)		
Hospitalization decision (%)			**Fisher**[c]	**<0.001**
Outpatient centre or private physician	552 (48.0)	91 (36.3)		
Hospital physician	39 (3.4)	4 (1.6)		
Emergencies	447 (41.4)	143 (57.0)		
Forensic institution	9 (0.8)	4 (1.6)		
Else	74 (6.4)	9 (3.6)		
Main diagnosis (%)			**Fisher**[c]	**<0.001**
Depressive disorder	260 (23.8)	7 (3.3)		
Substance use	53 (4.9)	5 (2.4)		
Psychotic disorder	383 (35.1)	112 (53.3)		
Bipolar disorder	104 (9.5)	61 (29.0)		
Anxious and behavioural disorders	122 (11.2)	3 (1.4)		
Personality disorder	153 (14.0)	17 (8.1)		
Else	17 (1.6)	5 (2.4)		
Involuntary admission = yes (%)	332 (28.8)	179 (71.3)	**159.42**[a]	**<0.001**
Admission HoNOS (median [IQR])	19.00 [14.00, 24.00]	24.00 [18.00, 29.00]	**62.49**[b]	**<0.001**
Discharge HoNOS (median [IQR])	9.00 [6.00, 14.00]	9.00 [6.00, 14.00]	0.42[b]	0.52
Admission HoNOS item 1 (median [IQR]) (overactive, aggressive, disruptive or agitated behaviour)	1.00 [0.00, 2.00]	3.00 [2.00, 4.00]	**192.88**[b]	**<0.001**
Discharge HoNOS item 1(median [IQR])	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	**27.61**[b]	**<0.001**
Stay duration (days) (median [IQR])	10.25 [4.85, 20.79]	27.57 [16.93, 61.36]	**164.25**[b]	**<0.001**

Abbreviations: IQR: interquartile range; No.: number; HoNOS: Health of the Nation Outcome Scales.
Significant results (with p values < 0.05) are indicated in bold print.
[a] Pearson's chi-square test.
[b] Kruskal–Wallis rank-sum test.
[c] Fisher's exact test.

0.68], p < 0.001 and 0.76 [0.75, 0.95], p < 0.001, respectively). The incidence of coercion was significantly higher in patients receiving disability benefits (IRR 1.13 [0.98, 1.22], p = 0.033). An increased risk of coercion was observed when the total number of previous psychiatric hospitalizations was higher (IRR 1.02 [1.01, 1.02], p < 0.001).

Clinical risk factors

Hospitalization decisions made by an outpatient physician were not significantly different from referrals from the emergency department regarding the subsequent risk of coercion (p = 0.092). The incidence of coercion was significantly lower in referrals from a hospital physician (transfer

Table 2 IRR per adult psychiatric hospital stay-year with multiple imputations.

	IRR	95% CI	p-Value
Gender = male	1.09	[1.03, 1.21]	**0.039**
Age (year)	1.00	[0.99, 1.00]	0.15
Civil status			
Single	1		
Married living as a couple	0.67	[0.62, 0.82]	**<0.001**
Married living separately	0.44	[0.38, 0.68]	**<0.001**
Divorced	0.76	[0.75, 0.95]	**<0.001**
Widowed	0.67	[0.35, 1.04]	0.14
Disability benefits = yes	1.13	[0.98, 1.22]	**0.033**
Total no. of psychiatric hospitalizations	1.02	[1.01, 1.02]	**<0.001**
Hospitalization decision			
Outpatient centre or private physician	1		
Hospital physician	0.43	[0.31, 0.69]	**<0.001**
Emergencies	1.08	[0.97, 1.15]	0.092
Forensic institution	6.30	[4.89, 6.87]	**<0.001**
Else	1.00	[0.76, 1.13]	0.98
Main diagnosis			
Depressive disorder	1		
Substance use	1.70	[0.92, 1.82]	**0.0010**
Psychotic disorder	2.97	[1.93, 3.09]	**<0.001**
Bipolar disorder	4.10	[3.94, 6.54]	**<0.001**
Anxious and behavioural disorders	0.98	[0.81, 1.54]	0.89
Personality disorder	6.64	[6.38, 6.86]	**<0.001**
Involuntary admission = yes	2.87	[2.44, 2.94]	**<0.001**
Admission HoNOS	1.03	[1.03, 1.04]	**<0.001**
Admission HoNOS item 1 (overactive, aggressive, disruptive or agitated behaviour)	1.43	[1.36, 1.46]	**<0.001**

Abbreviations: IRR: incidence rate ratio; CI: confidence intervals; No.: number; HoNOS: Health of the Nation Outcome Scales.
Significant results (with p values < 0.05) are indicated in bold print.

from another division) (IRR 0.43 [0.31, 0.69], $p < 0.001$) and was higher in referrals from a forensic institution (IRR 6.30 [4.89, 6.87], $p < 0.001$). Compared to a diagnosis of a depressive disorder, an increased risk of coercion was observed in diagnoses of substance use and psychotic, bipolar and personality disorders (respectively, IRR 1.70 [0.92, 1.82], $p = 0.001$; IRR 2.97 [1.93, 3.09], $p < 0.001$; IRR 4.10 [3.94, 6.54], $p < 0.001$; IRR 6.64 [6.38, 6.86], $p < 0.001$). An anxious and behavioural disorder was not significantly associated with a higher risk of coercion ($p = 0.89$). An increased risk of coercion was observed in cases of involuntary admission than in cases of voluntary hospitalization (IRR 2.87 [2.44, 2.94], $p < 0.001$). The incidence of coercion was higher for those with higher global HoNOS scores and higher scores on item 1 of the HoNOS at admission (respectively, IRR 1.03 [1.03, 1.04], $p < 0.001$; IRR 1.43 [1.36, 1.46], $p < 0.001$).

Discussion

Our study shows that 16.4% of the patients experienced at least one coercive measure during their stay that were longer. Regarding demographic risk factors, the incidence of coercion was higher in men who had a previous history of psychiatric hospitalizations and who received disability benefits. Compared to patients who were single, a reduced risk of coercion was observed in patients who were married or divorced. Age was not a significant risk factor for coercion. Clinical risk factors associated with a higher risk of coercion were diagnoses of psychotic and bipolar disorders and higher global and item 1 HoNOS scores at admission (overactive, aggressive, disruptive or agitated behaviour). Referrals from the emergency department did not differ significantly from hospitalization decisions made by an outpatient service. Key findings are summarized in Table 3.

The prevalence of 16.4% observed in the present study lies in the range of most previous studies reporting that 7–36% of the patients experienced coercion during their stay, with a high variability among countries.[21,25–31] Husum et al. found a prevalence of seclusion of 35%, varying from 0 to 88% across wards.[32] These results indicate a probable variation in the use of coercion depending on the ward's policy.[28,32] Cultural divergence could also explain the difference, as an Indian study found a coercion prevalence of 66.5%.[20] The prevalence of 16.4% identified in our study seems to be at the average level of other Western institutions.

Many results of this study are consistent with the literature on risk factors for coercion in high-income countries.[21,25–33] Few published articles were available on the use of coercion in low- and middle-income countries,[34] except for two Indian studies.[7,20]

Consistent with some studies, male gender was associated with an increased risk for coercion.[13,15,25,26] Men could indeed be more violent or subject to intoxications and thus

Table 3 Key messages.

Descriptive analyses
[-]16.4% of the adult psychiatric population with at least one coercive measure.
- Significantly longer duration of stay.
- 17.9% of the hospital stays with at least one coercive measure, seclusion in most of the cases (90.8%).
- Psychotic disorder as most frequent diagnosis (53.3%).
- Hospitalization decision for the coerced population originated more frequently from emergency services (57.0%).
- Higher global and item 1 admission HoNOS scores.
Multivariable analyses
Increased risk of coercion in the following:
[-]Men
- Patients receiving disability benefits
- Patients with a higher number of previous psychiatric hospitalizations
- Patients with higher global and item 1 admission HoNOS scores (overactive, aggressive, disruptive or agitated behaviour)
- Patients diagnosed with substance use and psychotic, bipolar and personality disorders, compared to those diagnosed with a depressive disorder
- Patients with hospitalization decisions originating from a forensic institution, compared to a hospitalization decision from an outpatient centre or private physician
Reduced risk of coercion in the following:
[-]Patients with a decision from a hospital physician, compared to from an outpatient centre
- Patients who were married (living as a couple or separately) or divorced, compared to those who were single
Decisions from emergency services did not differ significantly from those from outpatient centres.

require more coercion to contain aggressive behaviours. Interestingly, in our results, age was not shown to be a risk factor for coercion, in line with the findings of some studies.[14,25,26] However, other studies showed a correlation between age and coercion.[13,15] These results could be linked to a focus on the symptom (aggressivity/violence) when deciding to use coercion, rather than on the state of the disorder (early/chronic).

The incidence of coercion was lower in patients who were married or divorced than in those who were single. The results of the literature concerning this variable are highly divergent. Our hypothesis is that having a family could protect patients against coercion or that patients with a greater ability to engage in relationships (and thus being or having been married) could have a lower risk. Married or divorced patients may also be older than single patients and thus less at risk of violence and coercion.[15] However, this would imply that age is a risk factor, a result that was not retrieved in our study. In an Indian study, being married was a risk factor for coercion.[7,20]

The risk of coercion increased with the number of previous psychiatric hospitalizations, a result that may indicate an association between the risk of coercion and the severity of the course of the disease.[7,14,20,26] Similarly, the incidence of coercion was higher in patients receiving disability benefits. This could be an index of the severity of disease or social disaffiliation, but the causal relationship with coercion cannot be stated: the severity of disease could lead to the greater use of coercive measures,[14,24] but repeated and longer hospital stays could also lead to social disintegration.[7,20]

The most represented diagnoses in the population experiencing coercion were psychotic and bipolar disorders, and both diagnoses were associated with a higher risk of coercion than were depressive disorders. These results are consistent with the current literature.[18,25,33] The risk of coercion was also higher among those with substance use and personality disorders, a result that was described as a comorbidity that increased the use of coercion in studies on risk factors for involuntary hospitalization.[20,25,33] Substance abuse can indeed lead to aggressive and violent behaviour. Personality disorders could induce difficulties in the establishment of collaborative care between patients and staff.

Regarding the origin of the hospitalization decision, the incidence of coercion did not differ significantly for referrals from the emergency department vs those from an outpatient centre or private physician. Other studies mainly show a higher risk of coercion in cases of referrals from the emergency department or acute admission.[25,35] Our result could be explained by the policy of the division, which emphasizes outpatient care and thus habilitates outpatient clinics to manage patients with severe psychiatric disease (especially psychotic and bipolar disorders) and those at high risk of recurrent exacerbations. Outpatient centres directly refer patients to the hospital without requiring them to go to the emergency department.

An increased risk of coercion was associated with higher global scores and higher scores on item 1 in particular (overactive, aggressive, disruptive or agitated behaviour) on the HoNOS at admission. Silva et al. reported the same results for involuntary hospitalizations.[33] These results could support the use of this scale for a pertinent aggression risk

evaluation at admission; thus, it may be a useful instrument to predict the risk of coercion, which is mostly initiated because of aggressive behaviour.[26] Further research is needed to specifically compare the HoNOS with other risk assessment instruments.

Implications for clinical practice

Decreasing the risk factors for coercion to reduce the global use of coercion requires identifying the local risk factors and taking them into account with stakeholders in clinical practice. The present study is thus a first step in this coercion reduction process.

One specificity of our division is the open-door policy. The risk factors for coercion found in this study are thus interesting to consider when running an open ward. Despite the difference in policy, our results are globally comparable to other institutions, and consistent with some studies.[36] A clinical challenge with open wards is the risk of using seclusion to prevent absconding. However, the studies of Lang et al. and Huber et al. reported that locked-door policies did not prevent patients from absconding.[37,38] These results raise questions about how to adapt care in open-door policy settings without replacing one form of coercion with another while preserving the best interest of the patient.

Implications for research

Regarding future research, no recent systematic review on risk factors for coercion was available to compare the findings of this study to international trends. To our knowledge, no review on risk factors for seclusion has been published. Such work would be of interest to synthesize current knowledge of factors leading to or preventing coercion.

We conducted the study in the adult psychiatric population. Another important psychiatric population is geriatric patients, for whom the reasons for the use of coercion could be substantially different. In this population, an aim to protect patients from harming themselves could indeed be more easily assumed, rather than a containment method of aggression or violence, which seems more frequent in the adult psychiatric population. Further research on such differences in use could also be of interest.

Strengths and limitations

A strength of this study is that it is the first to analyse the factors influencing the use of coercion in units following an open-door policy. It already provides useful information on clinical elements linked to the risk of coercion, using a relatively large sample. However, the direct relation between the open-door policy and the use of coercion itself is currently not clear and needs further investigation. In particular, this study does not allow us to establish any causal relationship. A longer follow-up, including all hospitalizations for each patient, is needed to truly examine such relationships.

The main limitations concern the availability of data on some confounders and covariates, such as educational level, professional status, the day and time of the prescription of the coercive measure, the duration and specific reason for coercion, and the psychometric evaluation of hetero-aggressive risks or self-efficacy. Information on the prescribers of the coercion measure may also be useful.

Conclusions

During 2017, 16.4% of the adult population in our psychiatric division experienced at least one coercive measure during their stay that were longer. Risk factors for coercion were being male, being single, having psychotic or bipolar disorders, having previous psychiatric hospitalizations, having high HoNOS scores at admission, and being referred from outpatient physicians. Patients' ratings on the first HoNOS item at admission could be sufficient for a pertinent coercion risk evaluation. Although causality cannot be established, knowledge of which patients are at greater risk of coercion may help in the organization of prevention measures and thus reduce the actual use of coercion.

Author contributions

MC contributed to the development of the search question and strategies, the data collection and analysis and the main part of the manuscript redaction. SH participated in the development of the search question and strategies. SK and AW supervised the advancement of the project and contributed to the data analysis. OS supervised the advancement of the project and participated in the development of the search question and strategies and the data extraction. AO and ABB helped develop search strategies and contributed to the data collection and extraction. DC participated in the development of the search strategies and the main part of the data analysis. DC, SH, SK, AW and OS contributed to the manuscript redaction. The authors approved of the present manuscript.

Ethical considérations

The study protocol was accepted by the Swiss Ethics Committee on research involving humans of Geneva (N°2018-00988).

Conflict of interest

The authors have no conflict of interest to declare.

Funding

This retrospective study is part of a research programme investigating seclusion and restraint reduction funded by the University Hospital of Geneva.

Acknowledgements

We would like to acknowledge the contributions of Mr. Joël Danielian of the Department of Psychiatry of the University Hospital of Geneva for his help in developing the search strategy and data collection.

References

1. ASSM. Mesures de contrainte en médecine; directives médico-éthiques. Académie Suisse des Sciences Médicales. 2015 https://www.samw.ch/fr/Publications/Directives.html
2. Fisher WA. Restraint and seclusion: a review of the literature. Am J Psychiatry. 1994;51(11):1584–91, http://dx.doi.org/10.1176/ajp.151.11.1584.
3. Goulet MH, Larue C, Dumais A. Evaluation of seclusion and restraint reduction programs in mental health: a systematic review. Aggress Violent Behav. 2017;34:139–46, http://dx.doi.org/10.1016/j.avb.2017.01.019.
4. Tannsjo T. The convention on human rights and biomedicine and the use of coercion in psychiatry. J Med Ethics. 2004;30(5):430–4, http://dx.doi.org/10.1136/jme.2002.000703.
5. Hem MH, Gjerberg E, Husum TL, Pedersen R. Ethical challenges when using coercion in mental healthcare: a systematic literature review. Nurs Ethics. 2018;25(1):92–110, http://dx.doi.org/10.1177/0969733016629770.
6. Hotzy F, Jaeger M. Clinical relevance of informal coercion in psychiatric treatment—a systematic review. Front Psychiatry. 2016;7:197, http://dx.doi.org/10.3389/fpsyt.2016.00197.
7. Gowda GS, Noorthoorn EO, Kumar CN, Nanjegowda RB, Math SB. Clinical correlates and predictors of perceived coercion among psychiatric inpatients: a prospective pilot study. Asian J Psychiatry. 2016;22:34–40, http://dx.doi.org/10.1016/j.ajp.2016.04.004.
8. Lebel JL, Duxbury JA, Putkonen A. Multinational experiences in reducing and preventing the use of restraint and seclusion. J Psychosoc Nurs Ment Health Serv. 2014;52(11):22–9.
9. NASMHPD. Six core strategies for reducing seclusion and restraint use. Alexandria, VA: National Association of State Mental Health Program Directors; 2006.
10. Bowers L, James K, Quirk A, Simpson A, SUGAR, Stewart D, et al. Reducing conflict and containment rates on acute psychiatric wards: the safewards cluster randomised controlled trial. Int J Nurs Stud. 2015;52(9):1412–22.
11. Wullschleger A, Mielau J, Mahler L, Vandamme A, Montag C. Contributions to reduce coercion in psychiatric care. Fortschr Neurol Psychiatr. 2018;86(August (8)):500–8, http://dx.doi.org/10.1055/a-0604-2714. Epub 2018 Aug 20. Review. German. PubMed PMID: 30125922.
12. Commission Nationale de Prévention de la Torture. Rapport au Conseil d'État du canton de Fribourg concernant la visite de la Commission nationale de prévention de la torture au Centre de soins hospitaliers (CSH) de Marsens les 5 et 6 décembre 2016. Berne; 2017.
13. Kalisova L, Raboch J, Nawka A, Sampogna G, Cihal L, Kallert Tw, et al. Do patient and ward-related characteristics influence the use of coercive measures? Results from the EUNOMIA international study. Soc Psychiatry Psychiatr Epidemiol. 2014;49(October (10)):1619–29, http://dx.doi.org/10.1007/s00127-014-0872-6. Epub 2014 Apr 16. PubMed PMID: 24737189.
14. Raboch J, Kalisová L, Nawka A, Kitzlerová E, Onchev G, Karastergiou A, et al. Use of coercive measures during involuntary hospitalization: findings from ten European countries. Psychiatr Serv. 2010;61(October (10)):1012–7, http://dx.doi.org/10.1176/ps.2010.61.10.1012. PubMed PMID: 20889640.
15. Beghi M, Peroni F, Gabola P, Rossetti A, Cornaggi CM. Prevalence and risk factors for the use of restraint in psychiatry: a systematic review. Riv Psichiatr. 2013;48(1):10–22, http://dx.doi.org/10.1708/1228.13611.
16. Steinert T, Schreiber L, Metzger FG, Hirsch S. Open doors in psychiatric hospitals: an overview of empirical findings. Nervenarzt. 2019;90(July (7)):680–9, http://dx.doi.org/10.1007/s00115-019-0738-y. German. PubMed PMID: 31165212.
17. Swiss Civil Code (Code Civil Suisse). Nouveau droit de protection de l'adulte et de l'enfant. Art. 377-439 (1e Janvier 2013).
18. Chieze M, Hurst S, Kaiser S, Sentissi O. Effects of seclusion and restraint in adult psychiatry: a systematic review. Front Psychiatry. 2019;10:491, http://dx.doi.org/10.3389/fpsyt.2019.00491.
19. Krieger E, Moritz S, Weil R, Nagel M. Patients' attitudes towards and acceptance of coercion in psychiatry. Psychiatry Res. 2018;260:478–85, http://dx.doi.org/10.1016/j.psychres.2017.12.029.
20. Gowda GS, Lepping P, Noorthoorn EO, Ali SF, Kumar CN, Raveesh BN, et al. Restraint prevalence and perceived coercion among psychiatric inpatients from South India: a prospective study. Asian J Psychiatr. 2018;36:10–6, http://dx.doi.org/10.1016/j.ajp.2018.05.024.
21. Flammer E, Steinert T. Involuntary medication, seclusion, and restraint in German Psychiatric Hospitals after the adoption of legislation in 2013. Front Psychiatry. 2015;28(October (6)):153, http://dx.doi.org/10.3389/fpsyt.2015.00153, eCollection 2015. PubMed PMID: 26578985; PubMed Central PMCID: PMC4623390.
22. International Statistical Classification of Diseases and Related Health Problems 10th Revision, (ICD-10) OMS Genève, Masson, Paris 1993.
23. Wing JK, Beevor AS, Curtis RH, Park SBG, Hadden S, Burns A. Health of the Nation Outcome Scales (HoNOS): research and development. Br J Psychiatry. 1998;172:11–8.
24. Lauzon S, Corbière M, Bonin J-P, Bonsack C, Lesage AD, Ricard N. Validation de la version française du health of the nation outcome scales (HoNOS-F). Can J Psychiatry. 2001;46(9):841–6.
25. Hotzy F, Moetteli S, Theodoridou A, Schneeberger AR, Seifritz E, Hoff P, et al. Clinical course and prevalence of coercive measures: an observational study among involuntarily hospitalised psychiatric patients. Swiss Med Wkly. 2018;148(April):w14616, http://dx.doi.org/10.4414/smw.2018.14616, eCollection 2018. PubMed PMID: 29698543.
26. Flammer E, Steinert T, Eisele F, Bergk J, Uhlmann C. Who is subjected to coercive measures as a psychiatric inpatient? A multi-level analysis. Clin Pract Epidemiol Ment Health. 2013;9(July):110–9, http://dx.doi.org/10.2174/1745017901309010110, eCollection 2013. PubMed PMID: 23986786; PubMed Central PMCID: PMC3744855.
27. Steinert T, Noorthoorn EO, Mulder CL. The use of coercive interventions in mental health care in Germany and the Netherlands. A comparison of the developments in two neighboring countries. Front Public Health. 2014;2(September):141, http://dx.doi.org/10.3389/fpubh.2014.00141, eCollection 2014. Review. PubMed PMID: 25309893; PubMed Central PMCID: PMC4173217.
28. Noorthoorn E, Lepping P, Janssen W, Hoogendoorn A, Nijman H, Widdershoven G, et al. One-year incidence and prevalence of seclusion: Dutch findings in an international perspective. Soc Psychiatry Psychiatr Epidemiol. 2015;50(December (12)):1857–69, http://dx.doi.org/10.1007/s00127-015-1094-2. Epub 2015 Jul 19. Erratum in: Soc Psychiatry Psychiatr Epidemiol. 2015 Dec;50(12):1871-2. PubMed PMID:26188503.
29. Steinert T, Lepping P, Bernhardsgrütter R, Conca A, Hatling T, Janssen W, et al. Incidence of seclusion and restraint in psychiatric hospitals: a literature review and survey of international trends. Soc Psychiatry Psychiatr Epidemiol. 2010;45(September (9)):889–97, http://dx.doi.org/10.1007/s00127-009-0132-3. Epub 2009 Sep 2. Review. PubMed PMID: 19727530.
30. Steinert T, Zinkler M, Elsässer-Gaißmaier HP, Starrach A, Hoppstock S, Flammer E. Long-term tendencies in the use of seclusion and restraint in five psychiatric hospitals

in Germany. Psychiatr Prax. 2015;42(October (7)):377–83, http://dx.doi.org/10.1055/s-0034-1370174. Epub 2014 Jul 28. German. PubMed PMID: 25068687.
31. Steinert T, Martin V, Baur M, Bohnet U, Goebel R, Hermelink G, et al. Diagnosis-related frequency of compulsory measures in 10 German psychiatric hospitals and correlates with hospital characteristics. Soc Psychiatry Psychiatr Epidemiol. 2007;42(February (2)):140–5. Epub 2006 Dec 15. PubMed PMID: 17180296.
32. Husum TL, Bjørngaard JH, Finset A, Ruud T. A cross-sectional prospective study of seclusion, restraint and involuntary medication in acute psychiatric wards: patient, staff and ward characteristics. BMC Health Serv Res. 2010;6(April (10)):89, http://dx.doi.org/10.1186/1472-6963-10-89. PubMed PMID: 20370928; PubMed Central PMCID: PMC2858144.
33. Silva B, Golay P, Morandi S. Factors associated with involuntary hospitalisation for psychiatric patients in Switzerland: a retrospective study. BMC Psychiatry. 2018;18(December (1)):401, http://dx.doi.org/10.1186/s12888-018-1966-6. PubMed PMID: 30594163; PubMed Central PMCID: PMC6311042.
34. Chieze M, Hurst S, Sentissi O. Contrainte en psychiatrie: Etat des lieux des preuves d'efficacité. Swiss Arch Neurol Psychiatry. 2018;169(4):104–13, http://dx.doi.org/10.4414/sanp.2018.00573.
35. Thomsen C, Starkopf L, Hastrup LH, Andersen PK, Nordentoft M, Benros ME. Risk factors of coercion among psychiatric inpatients: a nationwide register-based cohort study. Soc Psychiatry Psychiatr Epidemiol. 2017;52(August (8)):979–87, http://dx.doi.org/10.1007/s00127-017-1363-3. Epub 2017 Mar 2. PMID: 28255793.
36. Steinert T, Scharfetter J. Wie können psychiatrische Kliniken in Österreich vollständig offengeführtwerden? PsychiatrPrax. 2018;45:1–6.
37. Lang UE, Hartmann S, Schulz-Hartmann S, Gudlowski Y, Ricken R, Munk I, et al. Do locked doors in psychiatric hospitals prevent patients from absconding? Eur J Psychiatry. 2010;24(4):199–204.
38. Huber CG, Schneeberger AR, Kowalinski E, Fröhlich D, von Felten S, Walter M, et al. Suicide risk and absconding in psychiatric hospitals with and without open door policies: a 15 year, observational study. Lancet Psychiatry. 2016;3(September (9)):842–9, http://dx.doi.org/10.1016/S2215-0366(16)30168-7. Epub 2016 Jul 29. PubMed PMID: 27477886.