

ORIGINAL ARTICLE

Effects of structural features of psychiatric hospital settings on coercive measures



Knut Hoffmann, Ida Sybille Hausleiter, Simone Agnes Efkemann, Marion Brand, Georg Juckel*

Department of Psychiatry, Psychotherapy and Preventive Medicine, LWL-Universitätsklinikum Bochum, Alexandrinenstr. 1-3, Bochum 44791, Germany

Received 4 May 2021; accepted 25 August 2021 Available online 27 September 2021

KEYWORDS

Coercive measures; Open-door policy; Law for acute psychiatry; Forced treatment

Abstract

Background and Objectives: Involuntary hospital admissions and coercive measures are a longlasting burden in psychiatry. Many efforts have been undertaken to diminish these wearing circumstances. With the Bochum "track system," which is structured in mental health teams across inpatient and outpatient clinics without any closed admission wards, we would like to present a new way of facing coercion. To examine the effects of establishing the so-called Bochum "track system" regarding the presumed reduction of coercive measures within a naturalistic, quantitative pre- and post- comparison.

Methods: Routine data on coercive measures (involuntary admissions, mechanical restraints, compulsory medications, one-to-one care) from two years of treatment (2011, 2017) are compared (N = 257 involuntary admissions) before and after the introduction of the track system.

Results: By changing the general conditions of the hospital, it was possible to reduce the number of coercive measures in the affected cases. The proportion of cases affected by coercion also tended to decrease, with women in particular appearing to benefit from introduction of the track system.

Conclusion: Structural changes in psychiatric hospitals can have a significant impact on one of the important quality parameters of psychiatric treatment, namely coercive measures.

© 2021 Asociación Universitaria de Zaragoza para el Progreso de la Psiquiatría y la Salud Mental. Published by Elsevier España, S.L.U. All rights reserved.

Introduction

E-mail address: JuckelGWK@aol.com (G. Juckel).

https://doi.org/10.1016/j.ejpsy.2021.08.002

Particularly against the background of the United Nations (UN) Convention on the Rights of Persons with Disabilities, the discussion on in involuntary hospital admissions and coercive measures was given a further boost by the German Medical Association,¹ the UN,² and the lay press. In the past, however, there have been repeated reports of rising

^{*} Corresponding author at: Department of Psychiatry, Ruhr University Bochum, LWL-University Hospital, Alexandrinenstr.1, 44791 Bochum, Germany.

^{0213-6163/© 2021} Asociación Universitaria de Zaragoza para el Progreso de la Psiquiatría y la Salud Mental. Published by Elsevier España, S.L. U. All rights reserved.

numbers of involuntary admissions³ in Germany. In a Europewide study, Dressing et al.⁴ and McLaughlin et al.⁵ were able to show that the increase in involuntary admissions in Germany was significantly higher than in some other European countries, and that the overall number of involuntary admissions was very high in comparison to other European countries. There were also regional and national differences, as indicated by Salize and co-workers.⁶ In contrast to the Netherlands,⁷ for example, Germany does not yet have an official government program to reduce the use of coercive measures, although the authors pointed out that it would probably not be possible to abstain from coercive measures in the long term.

With regard to influences on coercive measures, Rohe et al.⁸ were able to show that significant reductions in mechanical restraint or compulsory medication could be achieved with a corresponding adjustment. Overall, however, the literature on this point is sparse. Meanwhile, there are isolated standards for the prevention of custodial measures.⁹ A meta-analysis by Aguilera-Serrano et al.¹⁰ demonstrated that spatial conditions were important in 11 of the 34 studies included. This was justified by the gain in privacy. Price et al.¹¹ were able to find a positive change in patient reception of coercive measures when a combination of changed spatial conditions and professional de-escalation techniques was used.

The legal framework for the implementation of coercive measures in psychiatric hospitals has repeatedly been criticized from various directions, which has led to the corresponding regulations becoming significantly more restrictive over the years. Thus, the question also arises how courts will assess this matter in the future, the keywords here being "liberation of prisoners."

The possible influence of structural characteristics of psychiatric hospitals in the frequency and duration of coercive measures has also been discussed repeatedly. Until recently, the recording of coercive medication was very patchy and unsystematic: Steinert and Kallert found rates of $2-8\%^{12}$; older studies from the USA showed significantly lower rates (1.3%¹³); in contrast, a study by Allen and Currier¹⁴ showed a significantly higher rate of involuntary medication (16%) in 51 psychiatric emergency departments in general hospitals in the USA. There are also regional differences in the type of coercive measures used; in Switzerland, for example, isolation measures predominate. A multinational study by Kalisova et al.¹⁵ was able to discover high rates of coercive measures in Poland, Italy, and Greece and identified male patients with psychotic disorders as high risk for experiencing coercive measures. Martin et al.¹⁶ saw a higher risk for patients with organic brain disorders (34.1% of all patients who experienced coercive measures). The use of coercive measures was lower when detailed guidelines were available. Several studies have shown that the implementation of so-called "safe wards" is also leading to a reduction of coercive measures¹⁷ and that the reception of such measures amongst staff has changed in the sense of a change of attitude towards more open structures. Schneeberger et al.¹⁸ found fewer coercive measures in clinics with an open-door policy than in 21 psychiatric hospitals in Germany, but they found no differences in the occurrence of aggressive behaviour during treatment. In a retrospective study in North Rhine-Westfalia, which included data from one of the largest hospital networks in Germany, few influencing factors were found apart from the importance of the social psychiatric service.¹⁹ In this sample, young men with psychotic illnesses and older women were particularly at risk.²⁰

Based on the example of the Department of Psychiatry, Psychotherapy and Preventive Medicine of the Ruhr University Bochum with its innovative "track system," we were eager to examine how, by structural changes to the course of treatment, the extent of coercive measures can be reduced. Regarding this aim, we conducted a retrospective analysis of routine data before and after establishing the track system, resulting in a naturalistic pre-and post-comparison.

Methods

Intervention: the track system

The Department of Psychiatry, Psychotherapy and Preventive Medicine of the LWL University Hospital Bochum (located in the middle of Bochum, 130 beds, 44 day-time places, huge outpatient clinics with about 25.000 cases per vear, 6 tracks, responsible for the catchment area of around 220.000 people) is organized according to the "track system".²¹ This system differs from the usual organizational structures of psychiatric hospitals because not only are disorder-specific wards available, in which appropriate disorder-specific therapies are carried out, but the structure is kept constant throughout all stages of treatment - from pre-inpatient to full inpatient, day-patient and outpatient with a consistent treatment team. Due to this disorder-specificity and continuity of treatment, severely and less severely as well as chronically ill patients are individually looked after (needs-based) and benefit from each other. Thus, in this vertical rather than horizontal form of organization, day-care patients are integrated, and the respective outpatients of a track are cared for by this track. This integration of treatment for inpatient, day clinic, and outpatient treatment sectors (i.e., the abolition of internal sectorization) has led to the organic establishment of a model project, with a new care segment of flexible high-freguency outpatient services in the form of ward-independent services at the centre or at home. As a result, forms of "open psychiatry" could be established through the nosology-specific care of acute and aggressive patients in all tracks; the structure of 'open psychiatry' could be developed and the former closed wards removed. A decisive feature of the track system is therefore that the hospital no longer has a closed admission/acute care unit, but each track provides or creates the appropriate resources for implementing the necessary monitoring and coercive measures. By definition, coercive measures are intensified care, such as permanent one-to-one care or close permanent looking at, as well as even more invasive measures, such as mechanical restraint. All tracks provide monitoring options and are basically not closed. This means, for example, that if a crisis with auto-aggressive or even extrinsically aggressive behaviour occurs in the treatment area of personality disorder, there is no transfer to a closed reception area for increased monitoring; this is part of the treatment to maintain continuity of the relationship to be fulfilled by the team

of the personality-disorders track. The teams of the Dept. were trained intensively within a broad and detailed educational program with workshops and daily meeting. All aspects of the changes were explained and discussed. Each team were then able to formulate a new ward (=track) and treatment conceptualization paper which serves as orientation framework up to now. After transformation to the track system, no quantitative change of personnel structure and no increase in consumption of psychotropic drugs were observed. With the full implementation of the track system (after Oct 2012), there was no closed ward anymore, but possibilities to secure patients in each track such as one small area to intensify treatment of very severe and agitated patients. In the meantime, this system has been implemented at other locations, such as ZI-Mannheim.²²

Research design

The Department of Psychiatry, Psychotherapy and Preventive Medicine of the LWL University Hospital was completely converted to the treatment system described above on 1 October 2012. Within the scope of this investigation, the involuntary admission figures as well as the type and extent of coercive measures carried out were compared retrospectively from the routine data collected for the years 2011 (before starting this system) and 2017 (after establishing it fully). Following the basic idea of the track system, it was implemented in the whole hospital at once; therefore, the present data and analysis could not include any control group. This leads to limitations in the interpretation of the results, e.g., regarding causal influence and relationship, in the evaluation the effects of such complex interventions. Still, the presented data reveal important insights on the effects of such structural changes within the psychiatric setting. As such, the presented research design can be described as a naturalistic pre-and post-comparison of two different cohorts in the described years. Ethics approval was not required for the study after consultation with the ethics committee of Ruhr University Bochum, since routine data were used.

Data set

The data were collected from routine data by the medical controlling department. The data set included information on age, gender, diagnoses, legal status, and admission wards for all patients treated in the hospital during the two assessed years. Furthermore, data on coercive measures used, such as compulsory medication, mechanical restraint, permanent view, and one-to-one care, were obtained for patients who had been involuntarily admitted to the hospital. Due to legal regulations in Germany, coercive measures can be applied only for patients admitted involuntarily to the psychiatric hospital and, as such, those patients were expected to be most affected by the structural changes of the track system. Therefore, the analysis focused mainly on those cases of involuntary admissions and especially on those on the ward/track for psychotic disorders, as these happen to provide the most involuntary admissions. Based on benchmarking in another part of Germany,²³ both the number of coercive measures per affected case and the proportion of affected cases in relation to the involuntary admissions were calculated and represented the primary outcome for the evaluation.

Statistical analysis

The statistical analysis of the data was conducted using SPSS 26. Comparison of the two years was carried out using *t*-tests and ANCOVA to include covariates. The influence of the time period on the assessed measures was examined using binary logistic regressions, depending on the scale level of the dependant variables. F^2 was calculated as effect size for significant results in the logistic regressions, r for significant parameters in the ANCOVA and then transferred to η^2 and *Cohen's d* for significant results within the *t*-tests.

Results

Sample descriptions

The LWL University Hospital is responsible for the psychiatric care of the inhabitants of the east and central part of Bochum (catchment area of about 260,000 inhabitants). There have been approximately 2500 inpatients and day clinic treatments per year. In total, there were n = 4239inpatient admissions for the two years, of which n = 1945happened in 2011 and *n* = 2294 in 2017; 93.9% (*n* = 3982) of the admissions were voluntary, 3.7% (*n* = 155) were involuntary admissions according to the German Civil Code (BGB), and 2.4% (*n* = 102) were involuntary admissions according to the Law for Acute Psychiatry; there were no differences between the two years. A total of 47 (7%, n = 2022) of the patients were male, with an average age of 46.9 years (SD = 18.2) and an average hospital stay of 23.5 days (SD = 23.8). Table 1 gives the sociodemographic information and a yearly comparison, including diagnosis and wards at the time of discharge.

Proportion of cases affected

Of the involuntary admissions, 33.1% (n = 85) were affected by continuous observation, 18.7% (n = 48) by one-to-one care and 23.3% (n = 60) by mechanical restraint. A comparison of the two years shows that the proportion of affected admissions decreased for permanent view but increased for one to-one care; the proportion of admissions affected by mechanical restraint decreased slightly. As the largest proportion of involuntary admissions was placed in the track for psychotic disorders, this track was also examined separately in all analyses. The trends shown for all involuntary admissions can be observed even more clearly in Tables 1 and 2.

In order to investigate these developments and take other influencing factors into account, binary logistic regressions were carried out in each case, with the year, gender, age, and length of stay as predictors in the model. The respective statistical parameters are shown in Table 2 for the involuntary admissions from the ward/track for psychotic disorders. Dummy-coding was used for the categorical variables year and gender as predictors and '2011' and 'male' were each coded with 1.

When looking at the results for the involuntary admissions for the ward/track for psychotic disorders, no significant

K. Hoffmann,	1.S.	Hausleiter,	S.A.	Efkemann et al.
--------------	------	-------------	------	-----------------

Table 1Sociodemographic and diagnostic features (n = 257).									
	total <i>N</i> = 257		2011	n = 118	2017 <i>n</i> = 139				
	М	SD	М	SD	М	SD			
Age	45.1	17.3	45.5	17.5	44.7	17.3			
Duration of stay (days)	25.7	25.4	27.8	24.6	23.9	25.9			
	n	%	n	%	n	%			
Sex (male)	140	54.5	53	44.9	87	62.6			
Duration of stay (days)	25.7	25.4	27.8	24.6	23.9	25.9			
Track (demission)									
psychosis	164	63.8	60	50.8	104	74.8			
personality disorder	30	11.7	27	22.9	3	2.2			
affective disorder	14	5.4	9	7.6	5	3.6			
old age psychiatry	33	12.8	18	15.3	15	10.8			
addiction	16	6.2	4	3.4	12	8.6			
ICD-10 diagnosis									
F2	130	50.6	64	54.2	66	47.5			
F1	23	8.9	5	4.2	18	12.9			
F3	41	16.0	16	13.6	25	18.0			
F6&F0	45	17.5	23	19.5	22	15.8			
F4, F5, F7, F9	16	6.2	8	6.8	8	5.8			
other (not F)	2	0.8	2	1.7	0	0			

 Table 2
 Logistic regression on affected by coercion / involuntary admission, track "psychosis".

	В	SE	Wald	Exp(β) (95% CI)	R ² pseudo	χ ²
Mechanical restraint					.08	9.19
Year	.37	.40	.84	1.44 (0.66, 3.12)		
Sex	1.27	.47	7.42**	3.55 (1.43, 8.83)		
Age	.01	.01	.14	1.01 (0.98, 1.03)		
Duration of stay	.01	.01	.43	1.01 (0.99, 1.02)		
Permanent View					.08	8.78
Year	.62	.37	2.76	1.86 (0.90, 3.85)		
Sex	.93	.40	5.34*	2.54 (1.15, 5.62)		
Age	-0.01	.01	.52	.99 (0.96, 1.02)		
Duration of stay	.01	.01	.96	1.01 (0.99, 1.02)		
1:1 Care					.14	13.19**
Year	-1.01	.59	2.96	.36 (0.12, 1.15)		
Sex	1.51	.65	5.34*	4.50 (1.26, 16.13)		
Age	-0.02	.02	1.02	.98 (0.95, 1.02)		
Duration of stay	.01	.01	.47	1.01 (0.99, 1.02)		
Total					.08	9.86*
Year	.43	.36	1.47	1.54 (0.77, 3.12)		
Sex	.98	.38	6.71**	2.68 (1.27, 5.64)		
Age	-0.02	.01	1.29	.99 (0.96, 1.01)		
Duration of stay	.01	.01	.70	1.01 (0.99, 1.02)		

Note. N = 257, B = regression coefficient, SE = standard error, Wald = Wald-statistics, $Exp(\beta) =$ effect coefficient including confidence interval (95%), R^2 pseudo = Nagelkerke's R-squared, χ^2 = Chi-square.

p < .01, *** *p* < .001.

influence of the year could be seen; instead, the proportion of male patients played a special role here. Even if the calculated models appeared to be significant only for one-toone care and the sum of all coercive measures, gender was found to be a significant influence for all coercive measures, with male admissions having a significantly higher probability of being affected by coercive measures. Calculated effect sizes for the models revealed the effect for one-to-one care to be moderate with $f^2 = 0.16$ and the effect for the sum of all coercive measures to be small to moderate with $f^2 = 0.08$. This is particularly relevant because the proportion of males was higher in 2017 than in 2011, and

[,] p < .05,.

Table 3 Logistic regression on affected by coercion / involuntary admission, track "psychosis," divided by gender.							
	В	SE	Wald	$Exp(\beta)$	R ² pseudo	χ ²	
Mechanical restraint (male)					.00	.019	
Year	.06	.46	.02	1.07			
Mechanical restraint (female)					04	2.15	
Year	1.32	.88	2.25	3.75			
Permanent View (male)					.00	.00	
Year	.00	.45	.00	1.00			
Permanent View (female)					.13	8.26**	
Year	2.11	.84	6.39	8.25*			
1:1 Care (male)					.04	3.81	
Year	-1.19	.67	3.12	.31			
1:1 Care (female)					.00	.14	
Year	-0.46	1.25	.13	. 64			
Total (male)					.00	.01	
Year	-0.05	.43	.01	.95			
Total (female)					.07	4.43*	
Year	1.36	.67	4.09	.13***			

Table 3 Logistic regression on affected by coercion / involuntary admission, track "psychosis," divided l	vy gend	lei
---	---------	-----

Note. N = 164 (n = 102 male, n = 62 female). B = regression coefficient, SE = standard error, Wald = Wald-statistics, $Exp(\beta)$ = effect coefficient, R^2 pseudo = Nagelkerke's R-squared, χ^2 = Chi-square.

therefore any differences observed between the two years appear more likely to be due to this difference in the gender distribution of involuntary admissions.

As gender proved to be such a clear influencing factor, a further regression with the year as predictor was calculated separately for male and female patients. As shown clearly in Table 3, there were no changes over time for the male patients, but there was a reduction in the proportion of permanent views or coercive measures in general in the female patients. Again, those effects appeared to be moderate for permanent view with $f^2 = 0.15$ and small to moderate for coercive measures in general with $f^2 = 0.08$.

Number of coercive measures per case

As the admissions affected by coercion could be counted several times, the next step was to analyse the actual number of coercive measures per stay. While there were no differences between the years in the average length of stay. it can be assumed that this is not responsible for possible differences between the years in the average number of coercive measures. Only those admissions affected by the respective coercive measures were considered. It was shown that the affected admissions experienced means of 2.02 (SD = 2.61) for mechanical restraint, 2.67 (SD = 3.40) for permanent views and 5.85 (SD = 8.81) for one-to-one care sessions. For all measurements, it was found that the affected admissions experienced a mean of 5.97 (SD = 8.33) coercive measures.

Table 4 compares the average number of coercive measures of the affected admissions for the ward/track for psychotic disorders. In all the coercive measures examined, both overall and on a ward-by-ward basis, a tendency towards a decrease in the number was observed. The statistical analysis results for these trends are shown in Table 4. The calculated ANCOVA contained the same independent variables as the previously calculated regressions. Metric variables were included as covariates and categorical variables as fixed factors.

The only significant result was for the number of permanent views. Taking into account the significant influence of the length of stay as a covariate, the observed decrease from 2011 to 2017 was nevertheless significant. The calculated effect sizes of r = 0.75 or $\eta^2 = 0.56$ revealed a strong effect size for the length of stay, but with r = 0.56 or η^2 = 0.31 also a moderate effect of the years. Furthermore, in this area, the length of stay also had an influence on the number of coercive measures overall (r = 0.74 or $\eta^2 = 0.55$; moderate effect). In addition, gender had a significant influence on the number of one-to-one care sessions (r = 0.23 or $\eta^2 = 0.05$; small effect).

Duration of coercive measures

Finally, the duration of coercive measures conducted in each case was examined separately from the respective admissions. On average, mechanical restraint lasted for 5.29 h (SD = 4.77), arranged permanent views for 7.62 h (SD = 6.26), and arranged one-to-one care for 12.91 h (SD = 7.71). No sociodemographic variables could be included for these data because multiple admissions would have distorted the results. Therefore, only t-tests for independent samples were calculated to statistically verify the observed trends between years. The only significant difference was found for the increase in duration of one-to-one care sessions in the coercive measures (t(882.62) = -5.96), $p = .000; m_{2011} (SD_{2011}) = 11.03 (6.58), m_{2017} (SD_{2011}) = 14.00$ (8.10)). With Cohen's d = 0.39 this effect appeared to be small to moderate. The observed decrease in the duration of mechanical restraint (t(185) = 1.33, p = .186; m_{2011} $(SD_{2011}) = 5.72$ (4.95), m_{2017} $(SD_{2011}) = 4.79$ (4.50)) and

^{*} p < .05.

^{**} p < .01.

p < .001.

K.	Hoffmann,	I.S.	Hausleiter,	S.A.	Efkemann	et al.
----	-----------	------	-------------	------	----------	--------

Table 4ANCOVA on number of coercive measures per involuntary admission, track "psychosis".									
	n	df	F	Р	R ²	Adj. R ²			
Mechanical restraint	37	5	1.24	.316	.166	.032			
Year		1	.91	.348					
Age		1	.14	.709					
Sex		1	1.55	.223					
Duration of stay		1	1.02	.319					
Permanent View	45	5	2.68	.035*	.256	.160			
Year		1	4.31	.045*					
Age		1	.15	.703					
Sex		1	.14	.710					
Duration of stay		1	6.53	.015*					
1:1 Care	23	5	2.78	.052	.450	.288			
Year		1	2.93	.105					
Age		1	.01	.934					
Sex		1	7.48	.014*					
Duration of stay		1	3.24	.090					
Total	54	5	1.62	.172	.145	.055			
Year		1	1.66	.204					
Age		1	.00	.955					
Sex		1	0.32	.574					
Duration of stay		1	5.98	.018*					

Note. df = degrees of freedom, F = F statistics, $R^2 = R$ squared, Adj. R^2 = adjusted R squared. *p* < .05 ,** *p* < .01, *** *p* < .001.

permanent view (t(501) = 0.71, p = .476; m_{2011} $(SD_{2011}) = 7.80$ (6.48), m_{2017} $(SD_{2011}) = 7.40$ (6.00)) was not significant.

Discussion

In general, it can be stated that in the proportion of cases affected, the overall level of coercion (consisting of mechanical restraint and permanent views) decreased significantly after a complete changeover to the track system, and the increase in one-to-one care was presumably compensatory. This effect was statistically highly significant, especially for the female patients. The number of coercive measures per case also showed a similar trend, but only tended to become significant. There were no statistically significant differences with regard to the duration of coercive measures. It was noticeable that women in particular benefitted significantly from the track system: after its introduction, a significantly lower number of sightings and coercive measures were affected overall. This could possibly be due to the fact that female patients are more likely to benefit from intensive care or de-escalation measures than male patients. However, this is purely speculative and cannot be deduced directly from the data. Transference or counter-transference processes cannot be ruled out here, which may result in female patients being seen as less aggressive and thus lead to a lower level of tension on the part of therapists.

On the basis of the structural changes at the LWL University Hospital for Psychiatry, Psychotherapy and Preventive Medicine, it could be demonstrated that a change towards a continuous diagnosis-specific treatment concept, together with the change to an open treatment concept, leads to a reduction of coercive measures. This refers primarily to the cumulative mechanical restraint times, although the freguency has also decreased in tendency but is not statistically significant. On the other hand, there is a significant increase in intensive care measures, such as one-to-one care directly for the patient, but the close patient contacts (15 min, 30 min) also increased significantly. As a result, the processes in the daily structure must be adapted to these needs. Although there are no systematically statistical reports in Germany unfortunately up to now, numbers of involuntary admissions and coercion measures has increased across nearly all hospitals in Nordrhine-Westphalia within the years reported here 24.

In addition, it has to be mentioned that, before realizing such a concept, it is essential to discuss the processes intensively with the other organizations involved in the local provision of care (police, fire brigade, public order office, care courts) and, if necessary, to overcome resistance. Subjectively, patients consistently perceive such changes as positive.²⁴ However, Armgart et al.²⁵ were able to show in an earlier study that the reception of coercive measures by patients was largely negative, although in retrospect some understanding for such measures could be found.

From the employees' perspective, however, there are points of criticism in the sense that some of the problems here are self-image problems ("bouncer"' vs. "nurse"). For example, in an interview study with 15 doctors, 15 nurses and 15 patients who had proceeded with/experienced coercive measures, Kalagi et al.²⁴ were able to show that all three groups had a positive reception of intensive care measures (one-to-one care) and an intensified therapeutic offer at the ward door (the so-called "Bochum corner"). Such measures were perceived as a good compromise between care and autonomy and as being less invasive. Isolation measures such as closed wards or mechanical restraints were also perceived by all three groups as less traumatic in

view of the fact that they are affecting only single patients and not a whole ward. Overall, however, the need for more and better trained personnel was seen. Last but not least, intensive internal discussions resulted from the implemented measures, which ultimately led to the development and publication of the LWL standards for coercive measures,⁹ which are now binding for the entire LWL psychiatric network, with eleven clinics for adult psychiatry, four clinics for child/adolescent psychiatry, and more than 46,000 treatments annually.

In summary, despite all the restrictions, there are indications that a reduction in coercive measures can be achieved through appropriate structural and constructional measures; a less restrictive treatment structure has already led to a reduction in coercive measures.

Limitations

Owing to the special local situation, the results of our study can be transferred to other conditions only to a limited extent. Another limiting factor is that the observation periods are restricted and parallel changes in the legal framework have taken place that probably have had an influence on daily practice. Unfortunately, the routine data do not allow for the recording of compulsory medication, which has been changed in the meantime. The informative value is also limited due to the retrospective, naturalistic investigation approach. In addition, due to the already low proportion of involuntary placements, the present study has a rather small number of cases and thus high variances in the analysed data. However, as this was a full survey and no required case numbers can be aimed for in the naturalistic design, the observed but not significant trends are also of greater significance.

Outlook

The issue of involuntary and compulsive treatment of psychiatric patients is of immense importance, both from a human rights perspective and for the self-image of our profession, as well as in communication with a still very critical public. A reduction of such measures should be a priority goal of psychiatric treatment and research. Despite the limitations mentioned above, our study provides indications of the important structural components in this process.

Consequences for practice

- Coercive measures are an important quality criterion of psychiatric treatment.
- A connection can be established between the use of coercive measures and the structural conditions of a psychiatric hospital.
- In the run-up to such a changeover, comprehensive communication between other institutions involved in the provision of care (police, public order office, courts, fire brigade) is necessary.

Ethical considerations

Due to the agreement of data security management (LWL) and ethical committee of Ruhr University, there was no

separate ethical consideration for these retrospective analyses of anonymous routine data sets in a very large cohort.

Declaration of competing interest

The authors state that there is no conflict of interest.

Funding

None.

References

- Bundesärztekammer ZE. [German Medical Association]. Die neue UN-Konvention für die Rechte von Menschen mit Behinderung als Herausforderung für das ärztliche Handeln und das Gesundheitswesen (Stellungnahme) [The new UN-convention of rights for people with disabilities as a challenge for medical acting and the health system (Statement)]. Deutsches Ärzteblatt. 2010;107:297–300.
- United Nations. Convention of rights of persons with disabilities. 2006 www.un.org/disablilities/default.asp?id=150.
- Darsow-Schütte KI, Müller P. Zahl der Einweisungen nach PsychKG in 10 Jahren verdoppelt [Number of hospitalisations according to German PsychKG legislation has doubled in 10 years]. Psychiatr Prax. 2001;28:226–9. https://doi.org/ 10.1055/s-2001-15575.
- 4. Dressing H, Salize HJ. Compulsory admission of mentally ill patients in European Union Member States. Soc Psychiatry Psychiatr Epidemiol. 2004;39:797–803. https://doi.org/10.1007/s00127-004-0814-9.
- McLaughlin P, Giasco D, Priebe S. Use of coercive measures during involuntary psychiatric admission and treatment outcomes: data from a prospective study across 10 European countries. *PLoS ONE*. 2016;11:e0168720. https://doi.org/10.1371/journal.pone.0168720.
- Salize HJ, Dressing H. Epidemiology of involuntary placement of mentally ill people across the European Union. Br J Psychiatry. 2004;184:163-8. https://doi.org/10.1192/bjp.184.2.163.
- Noorthoorn E, Lepping P, Janssen W, et al. One-year incidence and prevalence of seclusion: dutch findings in an international perspective. Soc Psychiatry Psychiatr Epidemiol. 2015;50:1857 -69. https://doi.org/10.1007/s00127-015-1094-2.
- Rohe T, Dresler T, Stuhlinger M, Weber M, Strittmatter T, Fallgatter AJ. Architectural modernization of psychiatric hospitals influences the use of coercive measures. Nervenarzt. 2017;88:70-7. https://doi.org/10.1007/s00115-015-0054-0.
- 9. Gather J, Noeker M, Juckel G, eds. LWL-Standard zur Vermeidung, Anwendung und Dokumentation von freiheitsentziehenden Maßnahmen und Zwangsbehandlungen in der Psychiatrie [LWL-standard on avoiding, proceeding and documenting involuntary treatment and coercion in psychiatry], Lengerich: Pabst-Verlag; 2017.
- Aguilera-Serrano C, Guzman-Parra J, Garcia-Sancez JA, Moreno-Küstner B, Mayoral-Cleries F. Variables associated with the subjective experience of coercive measures in psychiatric inpatient treatment. Can J Psychiatry. 2018;63:129–44. https://doi.org/ 10.1177/0706743717738491.
- Price O, Baker J, Bee P, Grundy A, Scott A, Butler D. Patient perspectives on barriers and enablers to the use and effectiveness of de-escalation techniques for the management of violence and aggression in mental health settings. J Adv Nurs. 2018;74:614-25. https://doi.org/10.1111/jan.13488.

- Steinert T, Kallert TW. Medikamentöse Zwangsbehandlung in der Psychiatrie [Involuntary medication in psychiatry]. Psychiatr Prax. 2006;33:160–9. https://doi.org/10.1055/s-2005-867054.
- Hoge S, Appelbaum P, Lawlor T, Beck JC, Litman R, Greer A. A prospective, multicenter study of patients' refusal of antipsychotic medication. Arch Gen Psychiatry. 1990;26:949–56. https://doi.org/10.1001/archpsyc.1990.01810220065008.
- Allen M, Currier G. Use of restraint and pharmacotherapy in academic psychiatric emergency services. Gen Hosp Psychiatry. 2004;26:42–94. https://doi.org/10.1016/j.genhosppsych. 2003.08.002.
- Kalisova L, Raboch J, Nawka A, et al. Do patient and wardrelated characteristics influence the use of coercive measures? Results from the EUNOMIA international study. Soc Psychiatry Psychiatr Epidemiol. 2014;49:1619–29. https://doi.org/ 10.1007/s00127-014-0872-6.
- 16. Martin V, Kuster W, Baur M, et al. Die Inzidenz von Zwangsmaßnahmen als Qualitätsindikator in psychiatrischen Kliniken. Probleme der Datenerfassung und -verarbeitung und erste Ergebnisse [Incidence of coercive measures as an indicator of quality in psychiatric hospitals. Problems of data recording and processing, preliminary results of a benchmarking study]. Psychiatr Prax. 2007;34:26–33. https://doi.org/10.1055/s-2005-866920.
- Baumgard J, Jäckel D, Hebler-Böhlen H, et al. Preventing and reducing coercive measures – An evaluation of the implementation of the Safewards Model in two locked wards in Germany. Front Psychiatry. 2019;10:340. https://doi.org/10.3389/ fpsyt.2019.00340.
- Schneeberger AR, Kowalinski E, Fröhlich D, et al. Aggression and violence in psychiatric hospitals with and without open door policies: a 15-year naturalistic observation study. J Psychiatr Res. 2017;95:189–95. https://doi.org/10.1016/j.jpsychires. 2017.08.017.

- Emons B, Haussleiter IS, Kalthoff J, et al. Impact of social-psychiatric services and psychiatric clinics on involuntary admission. Int J Soc Psychiatry. 2014;60:672–80. https://doi.org/ 10.1177/0020764013511794.
- Hoffmann K, Haussleiter I, Illes F, et al. Preventing involuntary admissions: special needs for distinct patient groups. Ann Gen *Psychiatry*. 2017;16(3). https://doi.org/10.1186/s12991-016-12125-z.
- 21. Juckel G. Das "Track"- Konzept der LWL-Klinik Bochum-Stationäre und ambulante Behandlung aus einer Hand [Trackconcept at the LWL-Hospital Bochum: in- and outpatient treatment in one hand]. In: Kitzig F, ed. Krankenhaus im Wandel – Integrierte Behandlung – Integrierte Versorgung, Hausdruckerei Landschaftsverband Rheinland; 2011.
- Leweke FM, Hirjak D, Staudter C, et al. The CIMH track concept in psychiatry: syndrome-specific treatment across modalities part 1 - theoretical background. Fortschr Neurol Psychiatr. 2020;88:12–23. https://doi.org/10.1055/a-0759-1859.
- Steinert T. Benchmarking von freiheitseinschränkenden Zwangsmaßnahmen in psychiatrischen Kliniken [Benchmarking of freedom restricting coercive measures in psychiatry]. Z Evid Fortbild Qual Gesundheitswes. 2011;105:360–4. https://doi. org/10.1016/j.zefq.2011.05.018.
- 24. Kalagi J, Otte I, Vollmann J, Juckel G, Gather J. Requirements for the implementation of open door policies in acute psychiatry from a mental health professionals and patients view: a qualitative interview study. *BMC Psychiatry*. 2018;18:304. https://doi.org/10.1186/s12888-018-1866-9.
- Armgart C, Schaub M, Hoffmann K, et al. Negative Emotionen und Verständnis – Zwangsmaßnahmen aus Patientensicht [Negative emotions and understanding – patients' perspective on coercion]. Psychiatr Prax. 2013;40:278–84. https://doi.org/ 10.1055/s-0033-1343159.