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ORIGINAL PAPER

The use of coercive measures in adolescent psychiatric inpatient treatment: a nation-wide register study

Siponen Ulla · Välimäki Maritta · Kaltiala-Heino Riittakerttu

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Abstract
Purpose To evaluate the extent and trends in the use of seclusion/restraint in psychiatric inpatient treatment of adolescents aged 12–17 years in Finland.
Methods The National Hospital Discharge Register data comprising all psychiatric inpatient treatment periods of 12- to 17 year-olds in Finland during the period 1996–2003 was used. Time trends, regional variation and patient characteristics related to the risk of being subjected to seclusion/restraint in psychiatric inpatient treatment are reported.
Results The average prevalence of use of seclusion and restraint was 1.71/10,000/year over the study period. Use of seclusion/restraint in adolescent psychiatric inpatient care first increased, peaking in 1999–2001, and then decreased. The decrease occurred after stricter legislative control of use of seclusion/restraint was introduced in 2002, despite that involuntary treatment periods did not decrease. Considerable regional variation was seen in the use of seclusion/restraint. A greater proportion of girls than boys were secluded/restrained. Seclusion/restraint was most common in schizophrenia, mood disorders and conduct disorder.
Conclusions Legislative control had the desired immediate impact on the use of seclusion/restraint in adolescent psychiatric inpatient care. Legislative control is, however, not strong enough to ensure homogenous practices across the country, as there is many-fold regional variation in figures for using seclusion and restraint.

Keywords Seclusion · Restraint · Coercion · Adolescent psychiatry · Health services research

S. Ulla · V. Maritta
Department of Nursing Science, University of Turku, 20014 Turku, Finland

V. Maritta
The Hospital District of Southwest Finland, Turku University Hospital, Turku, Finland

K.-H. Riittakerttu
Department of Adolescent Psychiatry, Tampere University Hospital, Tampere, Finland

K.-H. Riittakerttu (✉)
School of Medicine, University of Tampere, 33014 University of Tampere, Finland
e-mail: merihe@uta.fi

K.-H. Riittakerttu
Vanha Vaasa Hospital, Vaasa, Finland

Introduction

Coercive measures, seclusion and mechanical restraint are used in psychiatric care worldwide [1] even if their impact on treatment outcome remains unknown [2]. The wide variation in the type, frequency and duration of coercive measures between countries has raised doubts about their use being more associated with culture, traditions and policies than with medical or safety requirements [3]. In adult psychiatry, for example, the rates of seclusion and restraint vary from 0 to 66% across settings, and regional differences can be seen within countries [4], whilst the patterns of using seclusion and restraint in a given hospital seem fairly constant over time [5]. Patterns of using seclusion and restraint do not seem to react to change in the size, function or policies of the hospital, or legislative changes [4, 6].

Patient characteristics that increase the risk of being secluded or restrained during inpatient stay have been

identified. In children and adolescent patients, these factors included being male, of younger age [7], having a diagnosis of disruptive behaviour disorder and having a history of suffering physical abuse [8] Secluded and restrained child and adolescent psychiatric patients display more problematic family background, higher levels of family dysfunction and greater numbers of stressful life events than other patients [7]. Children and adolescents admitted on an emergency basis and those belonging to ethnic minority groups were also more likely to undergo seclusion or restraint [9]. However, studies shedding light on patterns of using coercive measures in child and adolescent psychiatry are scarce and usually on a small scale, comprising data of one hospital.

In Finland, involuntary treatment and use of coercion in psychiatry are regulated by the Mental Health Act (116/1990) of 1990. The use of seclusion and restraint is only allowed if the patient is being treated on an involuntary basis (22 e section).The act was revised in 2002 (21.12.2001/1423) regarding the use of coercion and restrictions, aiming at decreased use of coercive measures (http://www.finlex.fi). In the amendment to the law, the conditions for using seclusion and restraint were made stricter than before (acceptable only to stop violent behaviour or prevent imminent violence); the hospitals were obliged to report biweekly to the authorities all events of seclusion and restraint and to keep records of all other restrictions applied to the patients. The legal representatives of the patient must be notified immediately of any episode of seclusion with duration of more than 12 h and mechanical restraint of more than 8 h.

Involuntary psychiatric admissions and involuntary psychiatric treatment periods of minors have vastly increased in Finland from the 1990s to the 2000s. The proportion of treatment periods with any stay on an involuntary basis of all minor inpatient treatments increased linearly from 16.2% in 1996 to 26.3% in 2003, 1.6-fold. In absolute numbers, from 1996 to 2003 the annual number of involuntary detainment of minors increased 2.5-fold (from 62 to 156, on average 22.4/10,000 adolescent inhabitants/year), whilst all the psychiatric inpatient treatment periods of adolescents increased 1.7-fold [10, 11]. Legislation concerning involuntary treatment on minors applies to both children and adolescents, but in practice, children are hospitalised with parental consent and formal involuntary treatment is usually considered for adolescents who fulfil the commitment criteria [10].

There is a lack of large-scale surveys describing how commonly coercive measures are used in psychiatric inpatient of minors. It is not known whether the use of coercive measures on minors in psychiatric care follows the trends of involuntary treatment of minors at large. Patient self-determination and autonomy are still a major ethical challenge in psychiatry [12–14], and the use of coercion severely endangers them.

Studies on adults suggest regional variation within the same legislation in the use of seclusion and restraint, a phenomenon that raises concerns regarding patient inequality before the law [4]. It is not known if similar features prevail in child and adolescent psychiatric care. Patient characteristics related to the use of coercive measures in child and adolescent psychiatry should be studied in nationally representative samples to avoid bias caused by selection to services. The aim of the present study was to explore in a nationally representative register data:

1) How common are seclusion and restraint used in the psychiatric inpatient care of adolescents aged 12–17 years?
2) Did the use of seclusion and restraint in adolescent psychiatric inpatient care increase or decrease in the period 1996–2003?
3) Is there regional variation in the use of seclusion and restraint in adolescent psychiatric inpatient care?
4) What are the patient characteristics related to the use of seclusion and restraint?

Materials and methods

A retrospective register study using the National Hospital Discharge Register was carried out. All psychiatric inpatient treatments of adolescents aged 12–17 years admitted between 1 January 1996 and 31 December 2003 were extracted from the National Hospital Discharge Register (NHDR). All hospitals in Finland are obliged to enter all inpatient treatments in the NHDR, which is therefore comprehensive. Age, sex, municipality of residence, dates of admission and discharge and diagnoses are recorded. For psychiatric inpatient treatments, type of referral (voluntary/involuntary), number of days spent in the hospital on an involuntary basis, use of seclusion (yes/no), restraint (yes/no), physical holding (yes/no) and involuntary i.m. medication (yes/no) are recorded.

In Finland, public specialist (secondary)-level health services including adolescent psychiatric inpatient care are provided by hospital districts ($n = 21$) that are coalitions of municipalities. Each hospital district has its own specialist-level adolescent psychiatric service comprising inpatient unit (usually 1–2 wards, and in the capital city several wards) and outpatient service. In addition, some individual municipalities in different parts of the country may provide their own adolescent psychiatric outpatient services, but inpatient services are only provided by hospital districts. Private inpatient adolescent psychiatric services do not exist.

The hospital districts form five tertiary-level catchment areas authorised by university hospitals. The university hospital provides tertiary-level health services for the hospital districts of its tertiary-level catchment area (that comprises 2–5 hospital districts), and acts as secondary-level health service for its own primary hospital district. The biggest university hospital catchment area serves a population of 1,836,555 (31.12.2010) in three hospital districts, and the smallest covers a population of 694,226 (31.12.2010) in two hospital districts.

The service structure and staff composition of adolescent psychiatric inpatient and outpatient services are basically similar in all hospital districts [15], but hospital districts with a small population (smallest: 28,007 inhabitants in 31.12.2010) of course have less inpatient places and less outpatient resources than districts with large populations (largest: 1,528,279 inhabitants in 31.12.2010). There is also variation in the adolescent psychiatric resources (such as number of professionals in services or annual budget per 10,000 adolescents), but the variation is randomly scattered across the country and does not create systematic differences between university hospital catchment areas [15].

The data were collected from all hospital districts and are presented for the whole of Finland and for the five tertiary-level catchment areas. The data size does not allow analyses by 21 hospital districts.

In the present study, psychiatric main diagnoses according to ICD-10 were used. In the analyses, psychiatric diagnoses are used as classified in the main diagnostic categories: substance abuse disorders (F10–19), schizophrenia group disorders (F20–29), mood disorders (F30–39), neurotic, stress-related and somatoform disorders (F40–49), disorders related to physiological and somatic conditions (F50–59), personality disorders (F60–69), developmental disorders (F80–89) and conduct disorders (F90–99).

By involuntary treatment, we refer to treatment periods including any stay on an involuntary basis. It is possible that patients arriving by involuntary referral are admitted and treated on a voluntary basis, or that they stay only for a part of the treatment period on an involuntary basis and part voluntarily, and voluntarily admitted patients may also be converted to involuntary status under specific conditions. Use of coercive measures is studied in relation to treatment periods including stay on an involuntary basis, because the Mental Health Act stipulates that coercion and restriction can only be used during involuntary treatment. We have previously described the regulation of involuntary admission and detainment in detail elsewhere [10, 11].

Annual incidence of all forms of coercive measures in the NHDR—seclusion, restraint, involuntary i.m. medication and physical holding—was evaluated. The total numbers of involuntary i.m. medication and physical holding were very small. Seclusion and restraint are similarly regulated in the Mental Health Act (http://www.finlex.fi) and no separate indications are given for their use. For these reasons, the trends, regional variation and targeting of the use of coercive measures are studied combining all the four measures.

Ethics approval was obtained from the Pirkanmaa Hospital District Ethics Committee.

Statistical analyses

Figures for the use of seclusion, restraint, involuntary i.m. medication and physical holding are given separately in absolute numbers by year. Figures for the use of coercive measures combined are given as absolute numbers, adjusted for the 12- to 17-year-old population and as proportion of involuntary treatment periods for the total sample over the whole study period, by year and by region. Population standardised rates with 95% confidence intervals are given per 10,000 12- to 17-year-old inhabitants. The 95% confidence limits for incidences were calculated based on Poisson distribution. The differences in incidences between university hospital tertiary-level catchment areas were compared using Poisson regression analysis. P values less than 0.05 were interpreted as significant. All data analyses were done with SAS 9.1 and SPSS 12.0.1 for Windows program.

Results

Use of coercive measures over time

Altogether, 531 incidents of coercive measures used in inpatient psychiatric treatment of adolescents aged 12–17 years were recorded from 1996 to 2003. Seclusion and restraint were much more common than involuntary i.m. medication and physical holding (Table 1).

Table 1 Number of adolescents (12–17 years) subjected to coercive measures in psychiatric inpatient care in Finland in 1996–2003

Year	Seclusion	Restraint	Involuntary i.m. medication	Physical holding	All coercive measures
1996	17	12	1	4	34
1997	14	18	1	5	38
1998	25	22	2	3	53
1999	34	41	10	4	89
2000	42	37	3	6	88
2001	56	38	4	3	91
2002	24	38	3	5	70
2003	23	37	4	4	68
Total	227	243	27	34	531

Of the involuntary treatment periods over the whole time period, 27% included use of coercive measures. The absolute number of coercive measures applied to minors in psychiatric inpatient care increased from 1996 to 2001, but after that the numbers decreased (Fig. 1). During the same period, the number of treatment periods of minors kept increasing, as also the total number of inpatient treatment periods of adolescents (Table 2).

Regional variations in the number of coercive measures

Statistically significant regional variation was found in the use of coercive measures in psychiatric inpatient care of minors, both as measured in population-adjusted figures and in proportions of involuntary inpatient treatment periods. Two of the five catchment areas presented with below average population-adjusted figures of involuntary treatments and of coercive measures, and in one of them the incidence of coercive measures in proportion to all involuntary treatment periods was also lower than in the other regions (Table 3).

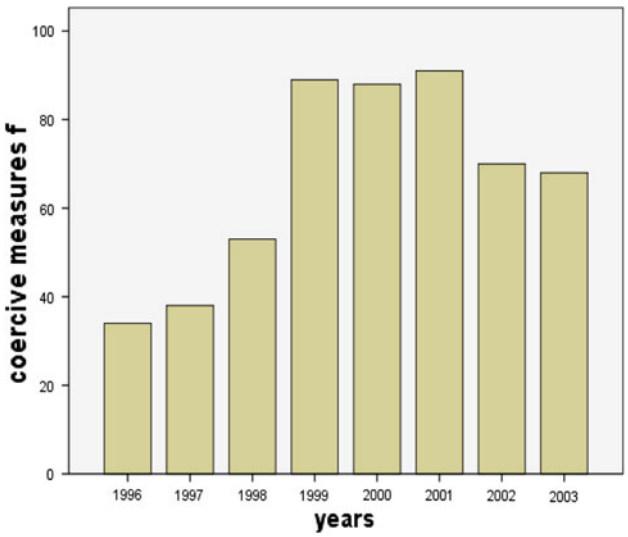

Fig. 1 Change over time in the use of coercive measures in adolescent psychiatric inpatient care during the period 1996–2003 in Finland

Table 2 Number of involuntary treatment and all treatment periods of minors in 1996–2003 and proportion (%) of treatment periods with coercive measures of involuntary treatments and of all treatments

Year	Treatment periods including involuntary stay	All treatment periods	% involuntary treatment periods with coercive measures	% all treatment periods with coercive measures
1996	127	880	26.8	3.9
1997	154	968	24.7	3.9
1998	181	989	29.3	2.9
1999	175	1,231	32.4	7.2
2000	312	1,501	28.2	5.9
2001	322	1,460	28.3	6.2
2002	277	1,361	28.5	5.4
2003	316	1,475	21.5	4.6

The risk of being subjected to coercive measures

Coercive measures were more commonly used in involuntary treatment of girls than of boys. Of the involuntary treatment periods of girls, 29.5% ($n = 347$) included coercive measures, and those of boys, 23.6% ($n = 184$) ($P = 0.005$). Coercive measures were applied equally frequently in involuntary treatment of early (12–14 years) and middle adolescents (15–17 years). In both age groups, 27% of patients in involuntary treatment were subjected to coercive measures (early adolescents, 145/544; middle adolescents, 386/1,420).

Coercive measures were unevenly distributed across diagnostic groups. Coercive measures were applied in 28% ($n = 151$) of the involuntary treatment periods with schizophrenia group (f20–29) diagnosis, 27% ($n = 144$) of involuntary treatment periods with diagnosis of mood disorders (f30–39), and in 23% of involuntary treatment periods with diagnosis in the conduct disorder group (f90–99), and less frequently in other diagnostic groups (Table 4).

Discussion

The absolute figures for use of coercive measures in adolescent psychiatric inpatient care increased from 1996 to 2001, but decreased thereafter. It seems that stricter regulation of using coercion and restrictions influenced the practices in adolescent psychiatry in the desired way, although there was no further decrease from 2002 to 2003, and the figures after the law revision remained on a higher level than in the mid-1990s. The immediate effect of stricter legal regulation may have attenuated later on. The present study cannot unfortunately cast light on why the use of coercive measures in adolescent psychiatric inpatient care increased so markedly in the late 1990s, other than the general increase in adolescent psychiatric inpatient care, both involuntary and voluntary [10, 11]. Nevertheless, the decrease in the number of incidences of coercive measures after the stricter legal regulation was passed is positive, but in contrast to developments in adult psychiatry, where no similar positive impact of legislative change could be demonstrated [4].

Although the legislative regulation of using coercion in psychiatry is the same across the country, there is

Table 3 Regional variation in population standardised rates (per 10,000 12- to 17-year-old inhabitants) of involuntary treatment and coercive measures between the five university hospital catchment areas (tertiary-level catchment areas) in Finland in 1996–2003

Tertiary-level catchment area	12- to 17-year-old inhabitants *f*	Involuntary treatment periods of minors *f*	Coercive measures used *f*	Involuntary treatment periods with coercive measures %	Involuntary treatments per 10,000 12- to 17-year inhabitants (95% CI) *f*	Coercive measures per 10,000 12- to 17-year inhabitants (95% CI) *f*
1 (HUS)	11,6448	835	223	28.1	71.7 (67.0–76.7)	19.2 (16.8–21.8)
2 (TYS)	48,928	366	99	27.0	74.8 (67.5–82.9)	20.2 (16.6–24.6)
3 (TAYS)	88,581	207	63	30.3	23.4 (20.4–26.8)	7.1 (5.6–9.1)
4 (KYS)	68,080	391	122	31.2	57.4 (52.0–63.4)	17.9 (15.0–21.4)
5 (OYS)	64,413	159	24	15.0	24.7 (21.1–28.8)	3.7 (2.5–5.6)
Total	38,6450	1,958	531	27.1	50.7 (48.4–52.9)	13.7 (12.6–15)

Table 4 Distribution of involuntary treatment periods and coercive measures across diagnostic groups in adolescent psychiatric inpatient care during the period 1996–2003

Diagnoses	Involuntary treatment periods		Incidents of using coercive measures	
	f	% of all involuntary treatments	*f*	% of all incidents of coercive measures
Substance use disorders (F10–19)	177	9	32	6
Schizophrenia group disorders (F20–29)	394	20.1	151	28.4
Mood disorders (F30–39)	562	28.6	144	27.1
Neurotic, stress-related and somatoform disorders (F40–49)	147	7.5	33	6.3
Disorders related to physiological and somatic conditions (F50–59)	61	3.1	8	1.5
Personality disorders (F60–69)	63	3.2	26	4.9
Developmental disorders (F80–89)	19	1	7	1.3
Conduct disorders (F90–F99)	527	26.8	124	23.4
Others	14	0.7	6	1.1
Total	1,964	100	531	100

statistically significant regional variation in the use of coercion measures on minors in psychiatric inpatient care. The area using coercive measures on minors most commonly exceeded the lowest use area by more than fivefold. There is no evidence that this variation is attributable to regional differences in prevalence of psychiatric disorders of minors in Finland. We have previously demonstrated that involuntary institutionalisation of minors in both psychiatric care and child welfare care varies regionally [10, 11] and that social deprivation and perhaps treatment cultures are more likely to explain the variation than, for example, care resources [16]. The present findings on the use of seclusion and restraint during inpatient care do not, however, systematically reflect socioeconomic differences between the studied regions. Northern and eastern Finland is socioeconomically less privileged than the southern and western areas. The tertiary-level catchment area with the lowest figures represents the north, but the second lowest figures are from a wealthy southern area.

A register study comparable to ours but amongst adult patients in Switzerland [17] suggested that despite that the severity of the patient's illness is the most important predictor for being subjected to coercion, a significant treatment centre effect nevertheless remains that cannot be attributed to patient characteristics. Vast differences in the use of coercive measures both in relation to population and in the proportion of involuntary treatment periods are likely due to treatment cultures, and statistical methods are insufficient to explore these. Qualitative research approaches are needed to achieve an understanding of the impact of treatment cultures on this issue. If different practices and treatment cultures result in vast variation in the use of deprivation of liberty and coercive measures, despite that the legal regulation attempts to ensure homogenous and least restrictive psychiatric care across the country, minors in different parts of the country are placed in unequal positions. Legislation seems not powerful enough to guarantee equal practices. Further research is warranted to shed light on the mechanisms that produce the differences.

That girls were more likely than boys to be subjected to coercive measures raises questions that cannot be answered by the present study design. Amongst adults, gender was not predictive of being secluded/restrained [18], and in a study amongst children and adolescents, male sex was associated with being subjected to coercive measures [7]. The legislation stipulates that coercive measures are to be

used only as a last resort in case of ongoing or imminent violence. Boys/men generally display more, and more severe, violent behaviour than girls/women, although in psychiatric inpatient populations the gender difference in violent behaviours seems to diminish [19, 20], and amongst adult schizophrenia patients, women even displayed minor violence more commonly than men [21]. On the other hand, a study in Finland demonstrated that girls displaying aggressive behaviours were more easily hospitalised involuntarily than boys displaying similar behaviours [22]. It is possible that the treating agents react more restrictively to girls' aggression, which is likely to be culturally less acceptable than that of boys.

Amongst the diagnostic groups, the use of coercive measures was associated with schizophrenia spectrum diagnoses, mood disorders and conduct disorder. Schizophrenia, and particularly certain symptoms of it, such as threat/control override-type delusional experiences, has been associated with risk of violence in adults and adolescents [23, 24]. It is also possible that patients with schizophrenia are subjected to coercive measures to control disturbing behaviour rather than violence [13]. Keski-Valkama et al. [18] reported that also amongst adults, a diagnosis of schizophrenia increases the risk of being secluded/restrained. Aggressive behaviour is a core characteristic of conduct disorder, and therefore use of coercive measures intended to control violence is not surprising amongst young people with conduct disorder, even if it is not known whether they have a therapeutic impact. Previous research has similarly associated disruptive disorders with a higher risk of being secluded/restrained [8]. Increased use of coercive measures in mood disorders is likely to be associated with controlling self-harming and suicidal behaviour, even if this may raise the question whether more therapeutic approaches are not available for this. Manic phases of bipolar illness are included in the mood disorder group and may of course also associate with aggressive behaviours towards others. Amongst the working, aged patients, the risk for being secluded/restrained was not increased in the mood disorder group [18].

To the best of our knowledge, comparable information on population standardised figures for use of coercive measures in adolescent psychiatry is not available. This is regrettable since comparable information could reveal differences that warrant attention, and this could inspire research that may result in important development of practices. Seclusion and restraint particularly raise severe professional, ethical and legal considerations, but they are nevertheless often considered unavoidable in the management of severe aggressive behaviours [25]. In child and adolescent psychiatry, seclusion and restraint have sometimes even been considered therapeutic in themselves [26–28], even if there is little evidence of their benefits beyond the immediate helpfulness in controlling acute aggressive behaviour [2]. Recent recommendations for managing aggression in child and adolescent psychiatry encourage prevention, early intervention with de-escalation techniques and therapeutic anger management programmes, with emphasis on enhancing patient autonomy and dignity. It has been demonstrated that reducing the use of coercion without compromising staff and patient safety is feasible [9, 29–36]. Reducing the use of coercion is an ethical imperative for psychiatric services [37].

The study was based on a nation-wide register data over an 8-year period. The data were comprehensive and representative. The annual numbers of coercive measures reported to the NHDR was, however, low, and the small total numbers of the studied events warrant caution in interpreting trends. A longer time series would be needed to draw firm conclusions on the effect of the law revision.

As numerous professionals report to the registers used in the study, it is possible that the data contain inaccuracies. However, it seems reasonable to assume that random inaccuracies will not systematically bias trends over time or regional differences, as there is no reason to assume more inaccuracies from certain districts or change in inaccuracies over time.

The number of involuntary i.m. medication and physical holding was so small that separate detailed analyses of their use were not possible. Absolute numbers indicate no changes over time in using physical holding, and the deviating figure in involuntary i.m. medication must be considered an outlier that allows no conclusion. The numbers of seclusion and restraint were bigger but nevertheless too small for separate analyses by region and diagnostic groups. On the other hand, the Mental Health Act makes no distinction between seclusion and restraint regarding their indication or restrictions on using them. They are treated in the legislation as completely interchangeable measures. Previous Finnish studies amongst adult patients [13, 38] suggest that seclusion and restraint are used interchangeably and that it is likely that treatment cultures and history of a given unit are likely to influence the choice of the measure in a situation that is deemed to require seclusion or restraint.

A limitation of the present study is that the data cannot shed light on why the use of coercive measures started to increase rapidly in the late 1990s in adolescent psychiatric inpatient care. Maybe when the legislation stipulated broader commitment criteria for minors in 1991, adolescents with conduct disorders who had previously been institutionalised in child welfare institutions started to be admitted in hospitals, too, and on involuntary basis. Their severe conduct problems may then have provoked use of coercive measures. However, we have previously demonstrated that not only involuntary admissions and detainments of

adolescents increased during the studied period, but also involuntary taking into care in child welfare placements increased [10, 11]. Therefore, we cannot argue that a shift from child welfare to adolescent psychiatry solely explains the increase in the late 1990s of the use of coercion in adolescent psychiatric care. Our follow-up time after the 2002 passed law revision is also not long. The positive immediate effect of legal regulation may have attenuated further on.

Conclusion

Unlike in adult psychiatry, the stricter legislative control of coercion and restrictions in psychiatric care in Finland had the desired immediate effect on the use of coercive measures in adolescent psychiatry. Regional variation in the use of coercive measures in adolescent psychiatric inpatient care is, however, vast and suggests that legislative control cannot ensure homogenous treatment practices across the country. As particularly seclusion and restraint are serious infringements with civil liberties, this is a severe problem. Girls are secluded and restrained more often than boys, which is also questionable in relation to equality. Research on the use of coercive measures is needed to develop approaches to reduce it, as it constitutes a severe risk in the wielding of power, and the clinical costs and benefits are not known.

Conflict of interest None.

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