Coercion in psychiatric care: challenges and perspectives

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"Coercion in psychiatric care: challenges and perspectives"

Thesis submitted to the Faculty of Medicine of
the University of Geneva

for the degree of Privat-Docent
by

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Geneva

2024

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Acknowledgements

First, I would like to thank Patrice Lalive d'Epinay, Yasser Khazaal, Daniele Zullino and Sebastian von Peter, who, from the start of my career, have passed on to me their passion for research, and their vision of a fairer and more open psychiatry.

I would also like to give special thanks to Christiane Montag, who has been a model of rigour, hard work, and sensibility for me, and who has supported and accompanied me in many projects. My special thanks also go to Lieselotte Mahler, whose passion, vision, commitment, and intelligence have always been a great source of respect and admiration, and whose friendship is a precious gift.

I would also like to express my sincere gratitude to Stefan Kaiser, who contributes every day to helping me develop my career, and who has honoured me with his trust in me to bring many clinical and scientific projects to a successful conclusion.

I would also like to thank all the colleagues who support me every day in my clinical work, and with whom I am very happy to have the opportunity to work. I would like to particularly thank Othman Sentissi, Thomas Rathelot, Aymeric Reyre, Jean-Pierre Bacchetta, Alessandra Maiorano, Giulia Meroni and Giulia Curletto for their help and presence on my side over the last years.

A special thank also to all the colleagues who contribute to the work of our research group and to whom I hope to be able to pass on some of my passion.

Lastly, I wish to thank my parents, whose love and support were invaluable throughout the years, my parents-in-law for their caring presence, my children, Lila, Basile and Malo, for making my life mor beautiful every day, and of course my wife, Marie, who through her love, patience, support and advice made this all possible.

Summary

The issue of coercion has been one of the major challenges in psychiatry since its earliest days. Coercion is a complex phenomenon, encompassing a wide range of practices, all of which have in common that they conflict with patients' autonomy. There are different dimensions to restraint, which need to be considered within a global model. It is therefore possible to distinguish at least three central dimensions: coercive measures in the strict sense of the term, which include measures restricting freedom of movement and involuntary pharmacological treatment; informal coercion, which consists of the use of pressures and incentives to make patients accept therapeutic proposals; and subjective or perceived coercion, which encompasses all coercive experiences of patients in the psychiatric system.

This thesis is structured around five original articles on three areas related to coercive measures: the negative consequences of coercion, risk factors for coercive measures, and interventions to reduce their use and consequences. The first article looks at the effects of coercion on the severity of psychiatric symptoms during hospitalisation, showing that the use of coercive measures is likely to worsen patients' mental state. The second and third articles are devoted to the study of risk factors for coercive measures in general adult psychiatric populations admitted via emergency departments, and in psycho-geriatric populations. Regarding emergency admissions, the results show that police intervention, aggressive behaviour and involuntary admission are all risk factors for the occurrence of coercive measures during hospitalisation. These measures mainly take place during the first 24 hours following admission. As for the elderly population, the study shows the determining role of cognitive disorders and associated aggressive behaviour in the use of coercive measures. Finally, the fourth and fifth articles present the results of a randomised clinical trial studying the effects of a debriefing intervention for coercive measures. They show that this intervention is effective in limiting the onset of post-traumatic stress symptoms and the level of perceived coercion.

Future research should focus on better defining informal coercive practices, studying the effects of new models of hospital care on the use of coercive measures, and finally on the use of coercion in outpatient setting, as well as in other areas of medicine.

Introduction

Coercion in psychiatric care is and remains one of the most critical and ethically challenging issues in psychiatric care, highly entangled with the very core of the history of psychiatry. The emergence of psychiatry as a medical discipline is closely linked to the issue of the detention of people long perceived as marginal and deviant. It was through the gradual paradigm shift from a moral conception of madness to a medical one, linked to cerebral deficits or damage, that the question of how to treat these people arose in the 18th century. These early ideas were embodied by Abraham Joly in Geneva, Gardiner Hill in the 19th century, who proposed a program of care that provided for the abolition of all restraint, or Pinel and Esquirol in France, to name a few examples. Although important, these initiatives and personal and institutional trajectories should not obscure the fact that this paradigm shift has by no means solved the problem of the detention and coercion imposed on the mentally ill, whose living conditions in institutions specially created for them have long remained undignified, confronting them to ill-treatment, deprivation of their rights and exclusion from society. The medical paradigm has not resolved the issue of their status, with the newly established psychiatry taking on the role of social control and protecting society from 'abnormal' behaviour. The advent of mental illness as a way of looking at the problem of madness has by no means resolved the question of the place of these people in society.

As a result, coercion as part of the psychiatric institution continues to populate the collective imagination and popular culture to this day, as evidenced by the many films, books and artistic productions of the 20th and 21st centuries. Indissociable from psychiatry, the issue of coercion continues to challenge the very nature of psychiatric care and its limits and places the figure of the psychiatrist in the dual position of a doctor and a representative of a society that is often reluctant to allow the most severely ill people to take their place as citizens.

Even today, coercion remains a major problem in psychiatric institutions, and continues to provoke much debate in society. At Geneva University Hospitals, around 20% of in-patients are subject to at least one measure restricting their freedom (isolation in a closed room, mechanical restraint, forced treatment) during their hospital stay, and a further 40% are hospitalised involuntarily. The issue of coercion is therefore highly topical and cannot leave psychiatric professionals unmoved, as they are confronted daily with these ethical and clinical questions, between respect for patient autonomy, the desire for beneficence rooted on their professional self-representations and the protection of society. However, coercion as a research subject was long underrepresented in the academic field, probably because it challenges the psychiatric institution as a whole and confronts professionals and policymakers with their very own limits and contradictions.

The heightened attention given by society to the issue of mental health in the general population after the CoViD-19 pandemic, while a cause for rejoicing, must not blind us to the plight and rights of the most vulnerable members of society, whose level of insecurity and poverty is increasing year on year. It is indeed these people who continue to experience coercion in the psychiatric system, and beyond that, exclusion, and non-respect for their rights.

This thesis, based on five published scientific articles, looks at coercion in psychiatric care, and seeks to describe the conditions under which it is used, its effects and ways of preventing it. Its aim is to contribute to the global debate that is vital for the future of psychiatry and its institutions.

General aspects of coercion

Definition

Coercion in psychiatric settings can be defined as the process of 'compelling a person who is receiving mental health care […] through physical force or threat to accept care or treatment against their will' [1].

Coercion is a complex phenomenon can be best apprehended as a continuum of practices. An often used model was described by Szmukler and Applebaum [2]. These authors described a spectrum of so-called treatment pressures comprising five categories: persuasion, interpersonal leverage, inducements, threats, and compulsory treatment (see Fig.1).

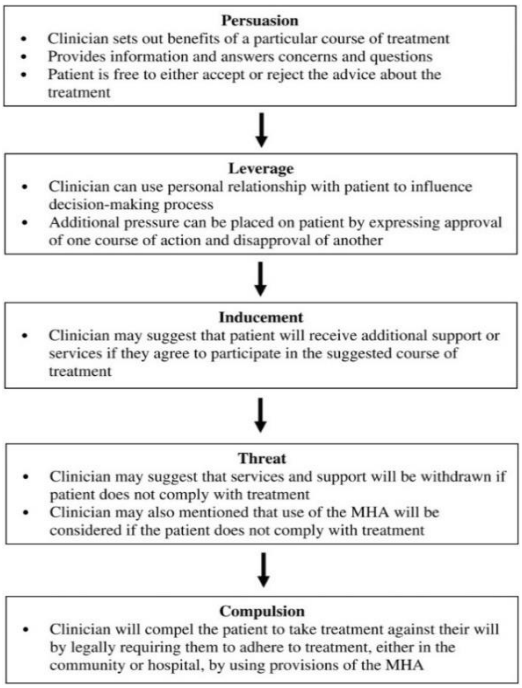

Fig. 1 Hierarchy of treatment pressures, published in Molodynski et al. 2020 [3]

Coercion could accordingly be defined as the use of threats or compulsory treatments or interventions. However, the frontier between these categories is often tenuous and the perception of interventions or actions can differ greatly between people. Moreover, only compulsory interventions are clearly defined by law, leaving a large range of potentially coercive actions and practices ill-defined and thus underestimated.

To best apprehend the complexity of coercion in psychiatric care, three dimensions should be distinguished: coercive measures, informal coercion, and subjective coercion.

Coercive Measures

The term coercive measures (also: formal coercion) refers to a set of interventions defined by law that limit a person's freedom of choice and/or movement. Coercive measures encompass following interventions:

- Involuntary hospitalisations
- Seclusion in a locked room
- Mechanical restraint, using belts, bed rails or any other kind of mechanical limitation of movement.
- Forced medication.
- Involuntary outpatient treatment

The present work will focus on seclusion, mechanical restraint and forced medication, which are all commonly used in inpatient settings and share common determinants, consequences, and potential reduction strategies. Involuntary hospital admissions and outpatient treatment will thus not be part of the present thesis.

Prevalence

The true prevalence of the use of coercive measures is difficult to determine, mainly because of a lack of systematic monitoring and centralised reporting [4-6]. As to Switzerland, the *Association nationale pour le développement de la qualité dans les hôpitaux et les cliniques* (ANQ) publishes a yearly report of different quality indicators, including the use of coercive measures across all psychiatric services. Its latest report shows that 11.5% of hospitalised patients in acute psychiatric care institutions were subject to coercive measures in 2021, with an ongoing upward trend over the last years [7]. As to other countries, available national or regional registry data show a 9.8% prevalence of coercive measures among hospitalised patients in Finland [8], 7,0% in Southwest Germany (excluding dementia and similar

diagnoses) [9], 12% in the Netherlands [10], and 14% in Denmark [11]. Comparable figures were found for Ireland and Wales [12]. Most other figures regarding the prevalence of coercive measures are derived from smaller observational studies. Among these, the EUNOMIA study, the biggest investigation of coercive measures across European countries, showed even higher rates of coercive measures, ranging from 21 to 59% all hospitalised patients who experienced at least one coercive measure during the first four weeks of inpatient treatment [13]. Most other observational studies use smaller random samples, with even wider ranges (from 0% to over 55%) [10].

Not only is there a great variation in the rates of coercive measures, but also in the kind of used measures, which greatly depends on national legislation and local culture. As an example, seclusion is prohibited in Denmark, as is mechanical restraint in the UK. The case of cage beds in Austria is another good example of a coercive practice developed and maintained in a local context that seems particularly offensive and shocking from an outside perspective. In line with this, research on this subject seems to indicate that the approval of different coercive methods is directly related to the professionals' own practices in their local context [14].

International comparisons are also limited by the way coercive measures are monitored and reported in different studies. To help homogenise these analyses, Steinert et al. proposed a set of measures that should be reported in the monitoring of coercive measures [15]. These include the following: proportion of cases concerned by coercive measures restricting freedom, average duration of a measure, average cumulative duration of coercive measures per case, and the proportion of time spent in coercive measures restricting freedom in total treatment time.

An international uniformisation of data collection regarding coercive measures would be of uttermost importance to allow the regular monitoring of coercive practices on a regional, national, and international level, and to help researchers accurately study this phenomenon.

Informal coercion

Informal coercion is a concept that refers to practices and attitudes of mental health professionals – or, generally speaking, all actors and stakeholders involved in these situations – not falling into the category of coercive measures but sharing with them the aim of forcing patients to accept different forms of treatment. According to Szmukler and Applebaum's continuum of treatment pressures, informal coercion refers specifically to the use of threats, i.e., when a proposal implies that the patient will be worse off if he or she refuses it. However, this rather restrictive perspective has recently been challenged by authors who argue that the coercive character of a proposal is not related to its explicit

content but rather to the patient's justified belief regarding its negative consequences, the justified character if this belief being in this case linked to contextual factors [16]. According to this definition, even apparently 'milder' forms of treatment pressures might become coercive in the patients' perspective, depending on the context, thus requiring great caution and sensibility on the part of professionals.

Because of its diffuse character, informal coercion remains difficult to study and quantify in practice. Most studies investigating the prevalence of this kind of coercion refer to the concept of leverage, i.e., the use of specific threats to improve treatment adherence related to four main domains: money, housing, criminal justice and child custody [17, 18]. Prevalence of the use of leverages in all forms of psychiatric care range between 30% and 60%. The acceptance of leverages and generally informal coercion is rather high among patients and professionals but seems to be directly related to the fairness and transparency of their use [19].

Interestingly, professionals seem to underestimate the use of informal coercion in psychiatric care, especially in its stronger forms [20, 21]. There is thus a need to inform and train professionals to recognise better the coercive character of treatment pressures and to use such interventions with caution and transparently.

Subjective coercion

Subjective coercion refers to the patients' perception of the coercive character of psychiatric care, regardless of the experience of 'objective' coercion. The concept emerged in the early 1990s through studies investigating the perception of psychiatric admissions and inpatient stays [22]. One of the most striking findings about subjective coercion is that the perception of care as coercive does not necessarily correlate with the legal admission status. In a study by Hoge et al., about 10% of voluntarily admitted patients reported feelings of having been coerced into the hospitalisation [23]. More recently, Bonsack and colleagues showed that about a third of voluntarily admitted patients questioned the voluntary character of their admission. Moreover, 74% of all patients reported pressures regarding their hospitalisation, regardless of their admission legal status [24].

High levels of subjective coercion are associated with poorer clinical outcomes and have a negative impact on outpatient care [25, 26]. Subjective coercion is also correlated to lower satisfaction levels [27]. Perceived fairness and procedural justice seem to lower the subjective perception of coercion [28]. When considered in direct relationship to the experience of coercive measures, the level of perceived coercion seems to be directly related to the perception of the decision-making process as fair and non-arbitrary [29].

Considering these elements and findings, subjective coercion should be considered as an important and complementary outcome when addressing the issue of coercion, as it relates to a global experience of psychiatric care and is not only limited to formal coercive aspects.

Multidimensional model of coercion

As described in the preceding sections, the phenomenon of coercion is not limited to the sole use of coercive measures. When considered in its whole complexity, coercion can be best apprehended as a multidimensional phenomenon, with coercive measures representing an 'objective' and legally regulated form of coercion that only accounts for a small proportion of a rather large and ill-defined set of practices. Subjective coercion could be in this context seen as a proxy that reflects the experience of psychiatric care as a wide process involving institutions, professionals, relatives, the judicial system, and social sets of values. This way of conceptualising coercion helps further reflecting on means to reduce its use in psychiatric institutions, especially inpatient services. Even if a strong focus on the reduction of coercive measures as a goal should be maintained because of the infringement of fundamental rights and the dramatic consequences they carry, every coercion reduction strategy should address the other dimensions of coercion if they want to make professional structures and cultures evolve on the long-term.

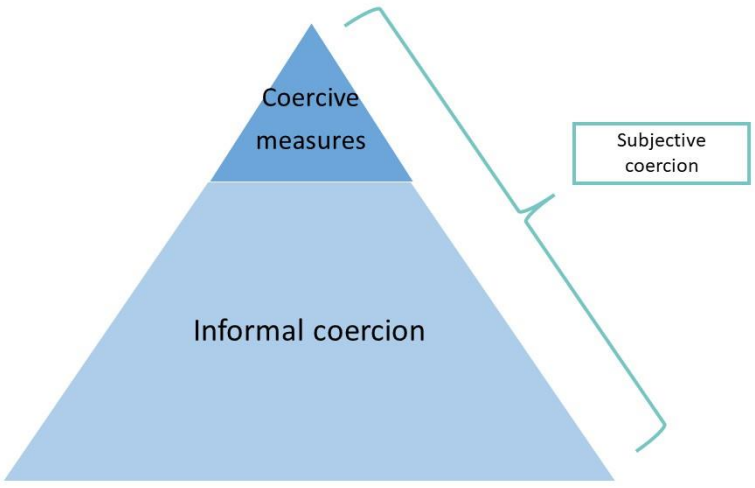

Fig. 2. Multidimensional model of coercion (personal material)

Legal aspects of coercion

International legislation

Coercion infringes on fundamental rights guaranteed by international and national legislations and related to principles of autonomy, bodily integrity or freedom of movement

[30]. Over the last decades, debates about the use of coercion in psychiatric care have been revived by the adoption of the Convention on the Rights of Persons with Disabilities (CRPD) [31]. This convention has initiated fierce debates around its interpretations and possible implications. The CRPD was developed as an international legal instrument protecting the rights of persons with all kinds of disabilities, including persons suffering from mental illnesses. It acts a paradigm shift in the very definition of disability, now defined as resulting from the interaction of persons 'who have long-term physical, mental, intellectual or sensory impairments […] with various barriers,' which 'may hinder their full and effective participation in society on an equal basis with others.' [31]. The Article 12 of the CRPD has been the focus of discussion around the issue of coercion. This article, affirming the equal recognition of persons with disabilities before the law, states that State Parties should provide, 'access by persons with disabilities to the support they may require in exercising their legal capacity,' and safeguards to 'prevent abuse in accordance with international human rights law "which 'shall ensure that measures relating to the exercise of legal capacity respect the rights, will and preferences of the person.'

This article has been subject to different interpretations, even among different UN bodies. The UN Committee monitoring the implementation of the CRPD has for example interpreted these statements as a clear prohibition of all involuntary detention and treatment of persons with mental health disabilities [32]. However, this interpretation was challenged by other UN bodies, such as the Human Rights Committee or the Subcommittee on Prevention of Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment [33]. The view of the CRPD Committee and its abolitionist perspective have been intensely criticised by psychiatrists, who alerted about the risks for persons with mental illnesses in case of a complete ban of all involuntary treatment [34, 35].

But beyond this debate around Article 12 and its interpretation, the CRPD implies a profound paradigm change in current legislations, as most of them, such as the Mental health act or the Swiss Civil Code, make special provision for the detention and treatment of persons living with mental illness, which can be seen as discriminatory regarding the Convention. Authors have proposed legislative changes that could address both the discriminative aspects of existing legislation while preserving a possibility of using coercion in case of decision-making incapacity [36]. Countries who ratified the CRPD committed to follow its principles and legislate accordingly. This is, however, far from reality. In Switzerland, the Committee on the Rights of Persons with Disabilities recently issued a report pointing the insufficient implementation process of the CRPD in national legislation [37].

Legal situation in Switzerland

In Switzerland, the use of coercive measures is regulated by the Civil Code. Measures limiting freedom of movement are the object of articles 383–385. Accordingly, such measures are only authorised as last resort in case of severe endangerment of oneself or others, or in case of a serious disruption to the community life. A written decision signed by a senior psychiatrist must be handed out to the concerned person or his/her authorised representatives, against which they can appeal within ten days.

Forced medication is governed by Art. 434 of the Civil Code. It stipulates that a decision of forced treatment can be made by an institution's chief psychiatrist when following requirements are met: a failure to carry out the treatment could lead to serious damage to the patient's health or seriously endanger the life or the physical integrity of third parties; the patient is unable to exercise judgement in relation to his or her need for treatment; no appropriate measure is available that is less invasive. Here again, a written decision with right to appeal must be handed to the person or his/her representative. The legislation further differentiates this kind of forced treatment from emergency interventions that can be carried out immediately in case of imminent danger to oneself or others, according to Art. 435.

This regulation brings forth several general comments. First, the Civil Code regulates measures limiting freedom of movement and forced treatment separately. This is not trivial and converges with a proposed categorisation of coercive measures in the literature, as interventions without a primary therapeutic purpose (measures limiting freedom of movement) and interventions with a primary therapeutic purpose (forced treatment) [38]. Accordingly, measures limiting freedom of movement should be considered as mere safety measures and their presumed therapeutic character thus questioned.

Second, the Swiss legislation gives medical doctors – in this case psychiatrists – a great latitude to decide upon the use of coercive interventions. In Switzerland, the civil court is only involved in case of appeal, so that there is no systematic judicial control over such impacting medical decisions. This differs from many other countries, for example Germany, where the legally imposed judicial control has been reinforced over the last decade. On a more general level, legislations regulating the use of coercive measures show a high degree of international variability, thus rendering the study of coercion and potential reduction strategies even more difficult [39, 40].

Third, the conditions stipulated in the Civil code, especially the notion of danger and of 'last resort' leave great room for interpretation. This results in the potential interpolation of highly subjective analysis factors in medical decision-making relating to coercive measures, as these two notions are unclearly defined. This lack of clarity as to the degree or nature of the danger, and as to the alternatives that should be tried and documented, undoubtedly means

that we do not have the most solid legal basis for limiting the use of such measures as far as possible.

Ethical aspects of coercion

Because of the infringement of fundamental rights it bears, the use of coercion always represents an ethical challenge for mental health professionals.

The justification of coercion is mostly based on an ethical deliberation focusing on the principles of medical ethics: autonomy, beneficence, non-maleficence, and justice.

In its very nature, coercion contravenes the principle of autonomy, according to which patients have a right to self-determination regarding every medical decision [41]. A legal translation of the principle of autonomy is the necessity for health professionals to obtain patients' informed consent. Directly related to the notion of informed consent is the concept of decision-making capacity, referring to a person's ability to understand and use available information regarding a medical condition and the treatment options to make a choice based on personal values and preferences. This capacity always pertains to a particular decision and time. The lack of decision-making capacity is rooted in most legislations as a necessary condition allowing overriding a person's autonomy and is thus one of the main pillars of the ethical justification of coercion [42].

Another important argument of the justification of coercion is based on the principle of beneficence. According to this argument, coercion in psychiatry is ethically justified because it makes it possible to treat an illness, and to avoid danger to the person or others. While this argument seems mainly valid and not very debatable for most somatic care situations, it raises many questions in a psychiatric context. Indeed, such an argument presupposes the clearest possible definition of danger, in terms of its nature, scope and temporality. It is essential to be able to show that a coercive measure, such as forced pharmacological treatment, will have such an effect on the underlying illness as to avoid the danger in question, which often can be understood as a major psychosocial risk. It should also be added that the question of the effectiveness of coercive measures is highly controversial, and that their many potentially deleterious effects must also be considered following the principle of non-maleficence [42].

As we can see, the complexity of situations in psychiatry makes any justification of coercion based solely on the pre-eminence of the principle of beneficence insufficient. Both the accounts of patients and the scientific evidence should encourage us to better justify any coercive action in care, and to raise our ethical standards as situations become more complex and fundamental rights more violated.

Respect for the principle of autonomy and beneficence, even in the event of incapacity for discernment, requires us to always act according to the presumed will of the person, which may have been recorded in advance declarations or conveyed by a therapeutic representative. The search for this presumed will must be the indispensable prerequisite for all coercive measures. They must also be 'last resort' measures, i.e., they must follow the failure of all other possible alternatives, including the use of shared decision-making aids. They must be proportionate to the situation and the danger involved, both in nature and duration. Finally, they must involve genuine, intensive care and support, and be clearly and transparently justified to patients, their families, and their representatives.

Risk factors for coercive measures

As mentioned in the preceding sections, the prevalence of coercive measures differs widely between countries and regions, but also between institutions or even wards. A large body of research over the past decades focused on the explanation of this variance. Several categories of explaining factors have been investigated, pertaining to patient-, staff- or ward-related factors.

As to risk factors related to socio-demographic patients' characteristics, most studies report a significant association between the use of coercive measures and male gender, especially seclusion and mechanical restraint [43-46]. This association is most probably explained by the tendency of male patients to exhibit violent behaviour or to be admitted in intoxicated states, both leading to a greater use of coercion. Other studies yielded no significant role of gender [47]. As to the particular case of forced medication outside emergency situations, a recent work showed that women were more at risk of receiving this kind of treatment [48].

Younger age also tends to be associated with coercion in existing studies, although available evidence is less clear [49]. As to the influence of ethnicity, studies yielded to date mixed results. A study by Bennewtih et al. found no direct influence of ethnicity on the use of coercive measures in general [50]. Other recent works showed on the contrary a relationship between minority status and the use of restraint in general and first-episode psychosis samples [51, 52]. Another recent meta-analysis yielded similar results for mechanical restraint used in the Emergency Department [53]. Another interesting study showed that the inability to communicate at admission was a central significant risk factor for coercion during hospitalisation [54].

Regarding clinical characteristics associated with a greater use of coercion, a large majority of studies showed that patients with a diagnosis of psychosis or mode disorders are at higher risk of being subject to coercion Symptom severity, as measured by the Brief Psychiatric Rating Scale (BPRS) or the Health of Nations Outcome Scale (HoNOS), especially the

symptoms clusters ‘aggressive behaviour’ or ‘hostility/suspiciousness’ are associated with a greater ruse of coercion, as are lower levels of global functioning [55, 56]. Previous psychiatric hospitalisations were also found to be a risk factor for coercion, probably as a proxy for the severity of underlying condition or poor adhesion to care [43].

Evidence regarding the influence of staff-related factors is highly inconclusive, mostly because of methodological flaws and limitations of the existing studies. Staff-to-patient ratio, experience of staff, gender and age of staff were all investigated with contradicting results [57]. Some studies suggest that nurses’ feeling of safety could be associated with a lower use of coercion, as is the case with staff attitudes towards coercion, although both these associations remain unclear [57].

As to ward-related factors, there is some evidence that architectural and organisational characteristics might have an influence on the use of coercion, such as the degree of available privacy or the visibility on wards [58]. Wards operating an open-door policy were shown to have a lower use of coercive measures compared to closed wards [59-61].

Considering larger-scale structural features of a catchment area, a German study showed that the number of beds and the proportion of involuntary admissions were positively associated with a higher use of coercion, although only the proportion of involuntary admissions entered the final regression model, explaining only a small proportion of the overall variance [62].

Overall, scientific works have failed to identify factors explaining the large variance of the use of coercion across countries and institutions. Coercion in psychiatric care is a multifactorial phenomenon that depends on a wide range of factors, including cultural and structural factors that are very difficult to operationalise and study. This has a significant influence on coercion reduction strategies, as we will see below.

Consequences of coercive measures

Evidence exists that coercive measures are associated with a wide range of potentially deleterious consequences on both physical and mental health. A recent review focusing on mechanical restraint demonstrated an association of this kind of intervention with physical harms and death [63]. The most common causes of death studies were cardiac arrest by means of strangulation or chest compression, and pulmonary embolism. Thromboembolic events were also frequently reported.

As to quantifiable clinical psychiatric outcomes, only few studies directly addressed the effect of coercive measures. They found mostly reported no direct influence of coercion on global functioning or self-reported symptoms [64-66]. Most works compared the effects of different

coercive measures and found no differences regarding functioning levels or aggression levels [67, 68]. However, a follow-up study to the RCT conducted by Bergk et al. (2011) that compared seclusion and mechanical restraint, showed greater PTSD symptoms in the mechanical restraint sample after one year [69]. The relationship between mechanical restraint and PTSD was somehow confirmed by another recent study comparing mechanical restraint to forced medication [70]. High levels of PTSD symptoms were also reported in an RCT investigating the effects of post-coercion review [71]. Coercive measures, particularly seclusion, seem to be associated with longer hospital stays [72].

Mechanical restraint or the use of a combination of coercive measures were shown to be less accepted by patients than forced medication [69, 73-75]. On the contrary, the EUNOMIA study showed a clear long-term disapproval of forced medication compared to other coercive measures [72]. One could hypothesise that the observed differences between coercive measures as to their coercive, disturbing, or even traumatic character relate to the degree of physical intervention and restraint imposed on a patient. Even if existing studies prevent to draw a clear hierarchy between coercive measures, it is extremely important in clinical practice to consider the degree of invasiveness of different coercive measures in every situation calling for a coercive intervention.

As to qualitative studies, most of them how that coercive measures are also related to pertaining feelings of dehumanisation, punishment, or humiliation [76, 77]. Patients also report feelings of powerlessness or loss of control over their identity and narrative [78, 79]. However, a small proportion of patients also report feelings of relief or safety and some kind of acceptance of the coercive interventions, which seems to increase over the course of treatment [80, 81]. Interestingly, the degree of positive impact and the perception of coercion in general is strongly associated with the quality of staff-patient interactions, in terms of communication, respect, fairness and empowerment [82-84]. As mentioned in the preceding section, special care must be employed by staff members as to the duration, proportionality and transparency of the decision-making process to promote patients' dignity [85].

Overall, the interpretation of results is impaired by the serious methodological limitations of most of the cited studies, including selection bias, insufficient power, cross-sectional designs, or missing confounding adjustment. There is also a clear lack of scientific works investigating the direct effects of coercive measures on clinical outcomes in comparison to non-coerced patients. With the development of evidence-based medicine, we need more scientific evidence on the efficacy and safety of coercive measures [43, 77].

Interventions to reduce coercion

To address the issue of coercion, psychiatric institutions have developed and implemented many strategies aiming to reduce the use of coercive measures and limit their negative impacts.

As mentioned in the preceding sections, coercion in psychiatric care is a complex and multifactorial issue. As such, the effects of single interventions, focusing on one aspect or risk factor, are very limited. Accordingly, scientific evidence shows that the reduction of the use of coercion can only be lastingly reduced by implementing a set of interventions, covering multiple areas related to this issue. This represents a great challenge for institutions, as most of the studied interventions imply a profound change in institutional practices and culture.

Intervention models encompassing a defined set of interventions have been developed and implemented over the last decades, with interesting and promising results. The Six Core Strategies is an example of such a programme. It focuses on six categories of interventions: leadership, use of data, workforce development, use of prevention tools, consumer roles, and debriefing techniques [86]. The implementation of this programme was shown to lead to a significant reduction of coercive measures [87-89]. Other models such as the Engagement model and the Safewards model, both partly focusing on the enhancement of wards' atmosphere, also showed interesting, although – for the Safewards model – contrasting results[90, 91]. Worth mentioning is also the 'Weddinger Modell', a German model of inpatient care relying on the improvement of participation, transparency, and individualisation in care through a Recovery-based approach. This model has shown an effect in reducing the number and duration of coercive measures, with the important limitation that these results were only drawn from pre-post studies [92].

Further interventions were also scientifically evaluated [93, 94]. Specific staff training and the early detection of violent behaviour using structured instruments were both shown to be effective in reducing coercion. Interventions aiming at changing the wards' environment, for example using 'sensory rooms,' were also effective. As to the use of advance directives or joint crisis plans, growing evidence suggests that their use is related to a reduction in coercion [95]. Lastly, the use of debriefing or post-coercion review has also been suggested as a means to reduce the use of coercion and its deleterious effect. Such interventions have shown an effect in the reduction of seclusion duration [71].

Noteworthy is the German guideline for the prevention of coercion, which recommends a set of 12 interventions to reduce the use of coercion. These interventions have been recently

studied in a RCT, which showed no direct effect on the use of coercion, although the implementation of the interventions was successful [96].

Perspective of the presented articles

The following articles constituting the basis of this thesis focus on three of the main issues described in the introduction: the consequences of coercion, the identification of risk factors, and the evaluation of an intervention aiming at reducing the deleterious effects of coercion. Their implications for clinical practice and future research will be discussed in the final section.

Articles

Effects of seclusion on mental health status among hospitalised patients

Reference:

Baggio S, Kaiser S, **Wullschleger A**. Effect of Seclusion on Mental Health Status in Hospitalized Psychiatric Populations: A Trial Emulation using Observational Data. Eval Health Prof. 2023. doi: 10.1177/01632787231164489.

This study investigates the negative consequences of coercive measures on the global burden of symptoms using a trial emulation of observational data. Data from 1200 psychiatric inpatients, classified as being either secluded or non-secluded during their hospital stay were used and analysed with inverse probability of treatment weighting to emulate the random assignment to the intervention (being secluded). The primary outcome was the Health of the Nations Outcome Scales (HoNOS), a scale used in routine as an indicator of symptoms and disease burden, comprising 13 items rated from 0 (no problems) to 4 (severe problem). The secondary outcome was the first item of the HoNOS, which focuses on overactive, aggressive, disruptive, or agitated behaviour. Both outcomes were assessed at hospital discharge. Confounding variables included gender, nationality (Swiss versus others), civil status (recoded as married or registered partnership versus single, divorced, or widower), previous hospitalisations in psychiatry (yes/no), involuntary admission (yes/no), psychiatric ward (adults versus geriatrics), duration of hospitalisation (less than 3 weeks versus 3 weeks or more), HoNOS score at admission, primary ICD-10 psychiatric diagnosis (two categories of disorders: psychotic disorders, bipolar disorder, and personality disorders vs. other disorders – dementia, mood disorders, anxiety disorders, intellectual disabilities, substance use disorders, and other disorders).

The analysis showed that there was a significant effect of seclusion with increases in both total HoNOS score ($p = .002$) and item 1 of the HoNOS ($p = .01$). These results show that seclusion may have a negative causal effect on both the global burden of symptoms and the level of aggressivity. Even if the observed changes in both total and item 1 HoNOS scores (1.49 and 0.25 points respectively) were modest, this analysis stresses the need to raise staff's awareness of the potential adverse effects of seclusion. It also provides scientific evidence and arguments against the idea of a therapeutic benefit of such coercive measures.

Predictors of coercion in the adult population

Reference:

Cole C, Vandamme A, Bermpohl F, Czernin K, **Wullschleger A***, Mahler L*. Correlates of seclusion and restraint of patients admitted to psychiatric inpatient treatment via a German emergency room. J Psychiatr Res 2020;130:201-6. 10.1016/j.jpsychires.2020.07.033.

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In this study, all patients (*N* = 1477) admitted to inpatient wards via the emergency room in 2018 at the Department of Psychiatry of the Charité University at St. Hedwig Hospital in Berlin were analysed to identify patient characteristics serving as predictors for coercive measures. The occurrence of a coercive measure, defined as seclusion or mechanical restraint, was used as dependent variable. A multivariate regression analysis was performed using following variables as predictors: age, gender, main diagnosis, previous hospital admissions in the same year (yes/no), mode of hospital referral, reason for the referral and admission mode.

Physical aggression before admission, involuntary admission, police referral to the emergency room and younger age were all significant predictors (p <.001) of the use of a coercive measure during hospital stay following emergency room referral. Of 218 cases who experienced coercive measures, 81.2% (n = 177) were subjected to seclusion or restraint within the first 24-hour of their hospital stay and 56.9% (n = 124) of cases only experienced coercive measures within these first 24-hour and were not subjected to any coercive measures afterwards.

These results highlight the particularities of the admission period regarding the use of coercion. Models of psychiatric inpatient care should put a special and strong focus on the management admission process, particularly for younger patients admitted against their will. Alternatives to coercive measures such as individual intensive care should always be considered. Patients' needs should always be elicited and relatives involved during this critical time.

Predictors of coercion in the geriatric population

Reference:

Chieze M, Kaiser S, Courvoisier D, Hurst S, Sentissi O, Fredouille J, **Wullschleger A**. Prevalence and risk factors for seclusion and restraint in old-age psychiatry inpatient units. BMC Psychiatry 2021;21:82. 10.1186/s12888-021-03095-4. Open access: https://archive-ouverte.unige.ch/unige:150329

This study addresses the specific question of the factors influencing the use of coercive measures among patients aged 65 and more hospitalised in 2017 in the Division of geriatric psychiatry of the Geneva University Hospitals (n=494). A multivariable Poisson regression was performed using the occurrence of a coercive measure as the dependent variable. Considered predictors were gender, age, civil status, nationality (Swiss/non-Swiss), previous stays during the year, lifetime previous psychiatric hospitalisations, main ICD-10 diagnosis, admission status (voluntary/involuntary), days spent hospitalised in 2017, the source of the decision to hospitalise (private psychiatrist, outpatient centres, emergency department, hospital psychiatrists, other), HoNOS total and item 1 scores at admission.

In the studied sample, 16.4% of patients experienced at least one coercive measure, mainly seclusion. Younger age, male gender, a diagnosis of cognitive disorder, previous psychiatric hospitalisations, emergency admission and more severe symptoms of aggressivity were all risk factors of the occurrence of coercion.

These results slightly differ from previous analyses on the general adult psychiatric population. Coercion in the elderly seems to be directly associated with cognitive disorders and aggressive behaviour, and not with the global burden of symptoms or a diagnosis of psychotic or bipolar disorder. These findings thus suggest a specificity of the geriatric population regarding the issue of coercion.

Effect of post-coercion review on symptoms of PTSD and subjective coercion

References:

Wullschleger A, Vandamme A, Mielau J, Stoll L, Heinz A, Bermpohl F, Bechdolf A, Stelzig M, Hardt O, Hauth I, Holthoff-Detto V, Mahler L, Montag C. Effect of standardized post-coercion review on subjective coercion: Results of a randomized-controlled trial. Eur Psychiatry 2021;64:e78. 10.1192/j.eurpsy.2021.2256. Open access: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8715283/pdf/S0924933821022562a.pdf

Wullschleger A, Vandamme A, Mielau J, Renner L, Bermpohl F, Heinz A, Montag C, Mahler L. Effect of standardized post-coercion review session on symptoms of PTSD: results from a randomized controlled trial. Eur Arch Psychiatry Clin Neurosci 2021;271:1077-87. 10.1007/s00406-020-01215-x. Open access: https://link.springer.com/content/pdf/10.1007/s00406-020-01215-x.pdf

Both studies report the results of a multicentred, randomised-controlled trial designed to investigate the effects of a new standardised post-coercion review intervention. The trial compared a group of patients who received the standardized post-coercion review (intervention group) and patients who didn't (control group). Post-coercion review consisted of a single interview reviewing the events that led to the use of a coercive measure as well as the patient's experience of the coercive measure itself. Patients who experienced at least one coercive measure were included in the trial and randomised using a Zelen's design. They were asked for their written consent and interviewed before discharge. Six psychiatric hospitals of the region of Berlin took part in the trial.

Trial outcomes included the severity of posttraumatic stress disorder (PTSD) symptoms measured by the Impact of Events Scale (IES-R) and the level of subjectively perceived coercion measured by the Coercion Ladder (CL) and the MacArthur Admission Experience Survey (AES).

Overall, 422 patients were randomised (intervention group n=211; control group n=211), and 109 were included in the trial (intervention group n=52; control group n=57).

As to **PTSD symptoms**, the effects of the intervention were analysed using a multivariate analysis of covariance (MANCOVA) and post-hoc univariate analyses of covariance (ANCOVAs), with the three IES-R subscales (hyperarousal, intrusions, avoidance) as dependent variables. Gender and its interaction with the intervention were used an independent variable. The level of the peritraumatic stress reaction, measured by the Peritraumatic Distress Inventory (PDI) was used as a covariate.

There was a statistically significant effect of the intervention at the multivariate level (Pillai's trace = 0.109, F – 3.75 – = 3,054, p = 0.034, partial η2 = 0.109). Further analysis showed that patients in the intervention group had lower levels of symptoms of hyperarousal and intrusions compared to the control group. Overall, there were 13 patients (28.3%) in the control group and 4 (11.1%) in the intervention group who had a high probability of having PTSD. This difference was not statistically significant.

As to **subjective coercion**, two separate analyses were performed. First, a MANCOVA was run to analyse the effects of the intervention on the two AES subscales (AES 1 and AES 2). Gender and age were used as a factor, respectively covariate. Post-hoc analyses of variance (ANOVAs) were then performed using Bonferroni correction. Second, another ANCOVA was performed to study the impact of post-coercion review on mean CL scores using a similar design. For both outcomes, a sensitivity per-protocol analysis was also performed to account for protocol violations.

Results of the intention-to-treat analysis yielded interestingly a significant interaction effect between the intervention and gender. Post-hoc analyses showed that the level of perceive coercion as measured by the AES was significantly lower among women who received the intervention. The sensitivity analysis showed both a main and an interaction effect between the intervention and gender on mean AES and CL scores.

This RCT was one of the first to study the clinical effects of post-coercion review. Although the level of attrition was high, the study was able to prove that standardised (or semi-structured) post-coercion review could effectively reduce some of the negative consequences of coercive measures.

Conclusions and Perspectives

Conclusions

The five selected articles all highlight different scientific themes and issues surrounding coercion in psychiatric care and all yield future scientific and clinical perspectives.

Consequences of coercive measures

Although some of the potentially deleterious consequences of coercive measures on physical health, therapeutic relationship, satisfaction, or engagement with psychiatric care are known, there is a notable knowledge gap regarding their consequences of psychiatric symptoms.

This question remains highly relevant, as the use of coercive measures such as seclusion or mechanical restraint interrogates the very core of all psychiatric and medical interventions in general, that are meant to provide help and protection to people in crisis or situations of vulnerability. The use of such measures against the expressed will of patients requires that an ethical deliberation take place, involving the weighting of potential harms and benefits. However, clinical consequences of coercive measures remain very difficult to study, due to ethical and methodological issues preventing the conduction of randomised controlled trials precisely analysing the effects of seclusion or other coercive measures.

The first study adds to the body of literature showing that coercive measures limiting freedom of movement lead to a wide range of negative consequences and is to our knowledge the first to specifically analyse these consequences under the aspect of mental health state and symptoms burden with this methodology. To date, no scientific work has shown a positive effect of coercion as a therapeutic intervention. This study even shows that seclusion might have a deleterious effect on symptoms levels and might counteract the therapeutic work done in the hospital.

As coercive measures such as seclusion or mechanical restraint are only authorised to protect individuals from harming themselves or others and must thus be seen as mere security measures. The fact that some patients retrospectively acknowledge coercion as helpful or justified does not mean that coercive measures can be seen in any way as therapeutic in the strict sense of the term. If this suggests that the decision to protect the person at this time was beneficial, this doesn’t say anything about the means used to attain this goal. The infringement of fundamental rights, the experienced dehumanisation, the risk of physical and psychological harm must all be weighed and considered, and less restrictive alternatives sought and tried before such measures can take place.

There is thus a need to pursue research efforts regarding the negative consequences of coercive measures. Based on the study presented here, a similar emulation trial analysis of Swiss national data has been conducted, the results of which will be published soon. The use of such methodological strategies and of national databases is a very promising way of overcoming the methodological issues pertaining to the subject of coercion [97]. Future similar large-scale studies are already planned, including other interesting outcomes such as stay duration, hospital readmissions or engagement with outpatient care, all essential in terms of quality of care and health economic perspective.

Risk factors of coercive measures

The second and third articles both relate to risk factors for coercive measures. As mentioned in the introduction, it is well known that the use of coercion undergoes extremely large variations among countries, regions, hospitals or even wards. There is an ongoing large debate about the reasons explaining these disparities. As mentioned earlier, multiple factors have been evoked, among which patient-related factors.

Two of the presented articles address this question by analysing patient-related factors influencing the use of coercion in two different populations. Aggressive behaviour and admission through the emergency department both were associated with a higher risk of being subject to a coercive measure during hospital stay. This might not seem surprising, as coercive measures such as seclusion or mechanical restraint are mainly used to manage and prevent violent behaviour and subsequent endangerment of others. One might adopt a fatalistic attitude regarding these findings, as aggressive behaviour in the context of psychiatric illnesses can appear as inevitable. One could also argue that the necessary protection of others and, of course, of psychiatric staff members leaves only little room for alternatives once violent behaviours show. However, these findings rather raise the question of potential alternatives before the crisis occurs. Specific staff training in de-escalation techniques or the use of structured assessment tools for the evaluation of aggressive behaviours have both been investigated as interventions reducing the use of coercion. Early detection and intervention in such situations might help prevent subsequent use of coercive measures. The Department of Psychiatry is currently implementing a new violence evaluation tool that will be used by every ward of the Department with the goal of assessing potential violent situations early on a three-level scale. Specific de-escalation interventions are directly associated to each level. The effects of this instrument will be evaluated in a further project.

The results of the second study also show that most coercive measures occur in the first 24 hours of the hospitalisation, a finding that was replicated in a further investigation [98]. This thus highlights the crucial role of the earliest phase of psychiatric hospitalisation, including

the visit to the emergency department (ED), that both represent a very sensitive period potentially associated with conflicts, tensions, and violence, and thus at high risk for coercive measures. Emergency psychiatric departments should thus imperatively be included in institutional coercion reduction strategies. This is particularly true for the Department of Psychiatry of the Geneva University Hospitals, where the ED is geographically separated from the hospital wards. A current project aims at analysing the amount and nature of coercive measures used in the ED prior to hospital admission, the results of which still are pending.

As to the third study, it specifically focuses on the geriatric population. Most research about the use of coercion in psychiatric settings involves the general adult population. Very few studies address the specific issues of coercion in geriatric population. Yet elderly patients are also confronted with coercive measures, not only in psychiatric but also in other medical settings. The geriatric population is characterised on the psychiatric level by a higher prevalence of cognitive and neurodegenerative disorders. These conditions often impair the decision-making abilities and can thus pose clinical and ethical challenges for professionals and relatives. The issue of coercion is thus particularly significant in this context. The specific findings of this study stress out the importance for professionals to consider specific alternatives to coercive measures targeting key symptoms among patients suffering from cognitive disorders, such as disorientation or disruptive behaviour. Such alternatives might encompass specific staff training, architectural changes, or multisensory spaces. On a more general level, they call for population-specific analyses of risk factors and subsequent specific interventions.

Further research projects regarding risk factors for coercion focus on two aspects. First, a planned analysis of socio-economic determinants of coercion. The poverty and social exclusion are both highly crucial issues when talking about psychiatric disorders, especially in urban areas [99]. However, little is known about the interplay of socio-economic status and the experience of coercion in psychiatric care. Using available regional data and spatial cluster detection approach, the project will aim to draw a cartography of the spatial distribution of patients subject to coercion in relation to their socio-economic status. This approach has already been used in other research projects in Geneva [100]. This project should help identify geographical areas ‘at risk’ for all forms of coercion, including involuntary hospitalisations. Interventions reinforcing outpatient care in such areas could then be specifically tailored and implemented.

Second, the role of staff members in the use of coercion constitutes another area of research with potential practical implications. A study investigating the relationship between staff

members' feeling of safety and attitudes towards coercion took place recently. Preliminary results show a direct relationship between the feeling of safety at the workplace and a more positive attitude towards coercion. Conversely, the emotional burden experienced by staff members in relationship to the use of coercion was correlated with a more critical view of coercion. Even if the direct influence of staff attitude on the use of coercion couldn't yet be shown, these results indicate that a special attention must be put on staff members' well-being at work. This should encompass a strengthening of staff training regarding violence management and coercion, with the inclusion of service users' perspective on this issue.

Post-coercion review

Post-coercion review (or debriefing) has long been recommended as an intervention that could help reduce the use of coercive measures or at least mitigate their negative consequences. As such, post-coercion review was for example part of the Six Core Strategies [86].

However, most recommendations remain elusive as to how such an intervention should be tailored and implemented, as well as to its actual effects. To make up for this shortcoming, a standardised interview guide for post-coercion review was developed at the Charité University in Berlin. This interview guide was then tested in a qualitative pilot study showing good acceptance and satisfaction among patients and professionals [101]. The particularity of this interview is that it involves both the patient and a member of staff involved in the decision to apply coercion and is moderated by another staff member. The results were very promising, showing that this kind of intervention could alleviate some of the negative consequences of coercion, in this case the development of PTSD symptoms and the level of subjective coercion.

It can be hypothesised that the involvement of patients and the facilitated dialog with the staff members help the recognition of emotions and the acknowledgement of all subjective perceptions of a crisis. This process enables to repair the therapeutic relationship and to operate a kind of re-subjectivation of the patients, allowing them to feel respected and treated fairly, both crucial in the perception of coercion in psychiatric care.

The potential of post-coercion review to reduce coercion during the same hospital stay could not be confirmed in this RCT, mostly because the very specific psychotherapeutic character of the intervention makes difficult for it to take place early after coercion took place. As to its preventive character for subsequent hospitalisations, it should be the object of future research. Nonetheless, these findings suggest that post-coercion review should be routinely implemented in psychiatric inpatient care, as its effect on PTSD symptoms and subjective coercion both could help improve quality of care in inpatient setting.

Standardised post-coercion review is currently progressively implemented in the Department of Psychiatry as part of a wider coercion reduction program that includes the close monitoring of coercive measures, the instauration of guidelines for the use of coercion or the development of a new nursing role designed to promote ‘good practices’ regarding coercion.

Future research projects will aim at investigating with a larger sample the preventive effects of post-coercion review on future coercive measures. The association of post-coercion review and joint crisis plans, or advance statements should be specifically studied, as the use of such instruments is likely to strengthen the effects of post-coercion review. The effects of the intervention on the quality of the therapeutic relationship, treatment adherence, and satisfaction, should also be part of such a research design.

Future perspectives

Based on the presented articles and the issues outlined in the introduction of this thesis, other perspectives for future research and clinical interventions can be drawn.

A current undergoing project aims at analysing the occurrence of coercion during the whole trajectory of care, from the on-site ambulance intervention to the psychiatric hospital admission. There is most probably an underestimation of the prevalence of all forms of coercion. A better understanding of the timing of coercive measures across the trajectory of care could provide important insights to develop specific preventive or training interventions across settings (paramedical staff, emergency departments).

Considering the different dimensions of coercion, a better definition of coercive practices related to the category of informal coercion is crucial. As mentioned in the introduction, such practices are currently insufficiently known and recognised by mental health professionals. Future research in this domain should be developed that directly include the perspective of service users, through participative designs. Such projects could help better understand the kinds of experiences made in psychiatric services that are perceived as coercive, and more generally as negative or even traumatic. An important goal could be the development of a specific scale that could allow the quantification of such experiences. This could in turn sensitise professionals and help developing specific interventions targeting these experiences.

Another important clinical and scientific project of the Department of Psychiatry is the development and implementation of a new model of inpatient care, the Geneva Inclusive Model (ModInG). This recovery-oriented programme is largely inspired by the above-mentioned Weddinger Modell. The ModInG foresees major structural changes in hospital units, in particular the reorganisation of clinical discussion and decision-making spaces, as well as the medical and nursing reference model, and the systematic inclusion of relatives in

care. To study the effects of this new model of care, a study comparing a pilot ward working with the new approach with two other similar wards providing care as usual will take place. The number and duration of coercive measures, mean stay duration, symptom severity, personal recovery, ward atmosphere and patients' satisfaction will all be included as outcomes. This project should help further implement this new model and provide methodologically sound evidence of the effects of such recovery-based approaches on coercion reduction.

Beyond the sole inpatient setting, coercion will also be investigated in outpatient centres. Even in the absence of formal coercive measures and, at least for the Canton of Geneva, official compulsory outpatient treatment, patients are subject to coercive practices, mostly pertaining to informal coercion or leverages. Experiences of coercion in outpatient care and their consequences on treatment adherence or readmissions are not sufficiently described. The Division of adult Psychiatry (SPA) has begun in 2023 a systematic evaluation of personal recovery and its determinants among patients suffering from psychotic disorders. This large – scale prospective cohort study includes measures of perceived coercion and use of leverages, which will help gain a deeper understanding of coercion in outpatient care and its influencing factors. Additionally, another research project will analyse the effects of outpatient commitment as it is practised in the Canton of Geneva, namely through the conditional suspension of inpatient commitment by the Civil court. This kind of outpatient commitment is regularly used in situations where the adherence to outpatient care and pharmacological treatment are fragile. However, the effects of this approach on effective treatment adherence and readmissions are unknown. The planned research project should fill this gap and add to the body of literature regarding outpatient commitment, which showed mostly no positive effect of outpatient coercive treatment [102].

Lastly, there is a real need to extend research about the phenomenon of coercion to other areas of medical care. There is a lack of available data regarding the reality of coercive practices in general medical care, as well as probably a lack of awareness and training of staff. Research is needed to better characterise the frequency, and type of coercion being used in other divisions. Little is known about the specific impact of such measures on patients suffering from primary somatic disorders or about potentially useful interventions to limit their use.

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Original Manuscript

Effect of Seclusion on Mental Health Status in Hospitalized Psychiatric Populations: A Trial Emulation using Observational Data

Evaluation & the Health Professions
2023, Vol. 0(0) 1–8

DOI: 10.1177/01632787231164489
journals.sagepub.com/home/ehp


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Abstract

The use of coercive practices, i.e., interventions against a person's will, is controversial. Recent observational studies highlighted their potential detrimental effects on patients' mental health, but this topic remains understudied. This study investigated the effect of a common coercive practice, seclusion (i.e., being locked in a closed room), on mental health using a trial emulation of observational data to allow causal inference. We used data from 1200 psychiatric inpatients, classified as being either secluded or non-secluded during their hospital stay. Inverse probability of treatment weighting was used to emulate the random assignment to the intervention. The primary outcome was the Health of the Nations Outcome Scales (HoNOS). The secondary outcome was the first item of the HoNOS, which focuses on overactive, aggressive, disruptive, or agitated behavior. Both outcomes were assessed at hospital discharge. There was a significant effect of seclusion with increases in both total HoNOS score (p = .002) and item 1 of the HoNOS (p = .01). Seclusion may have a negative causal effect of patients' mental health status and should therefore be avoided in mental health care settings. Training efforts should raise the awareness of the medical staff about potential adverse effects instead of therapeutic benefits.

Keywords

coercion, ethics, inpatient psychiatry, seclusion

Coercive practices, i.e., the use of interventions against a person's will, are commonly used in mental health care settings. Coercive measures include involuntary admission, seclusion (i.e., being locked in a closed room), physical restraint, and forced treatment. They are mostly used to manage aggressive behaviors or in life-threatening situations that cannot be managed otherwise (Newton-Howes, 2013).

The present study focused on seclusion, which is commonly used in adult inpatient psychiatry. Seclusion is most used to prevent self-harm and harm of others because of aggressive behavior. Seclusion was the most used coercive measure in the setting where the study took place (Chieze et al., 2021a, 2021b). Coercive measures are controversial because they may violate several principles, even if they are unfortunately sometimes inevitable.

First, coercion is a threat to human rights, as it overrules individuals' will and preferences (Gooding et al., 2020). Coercion violates the central guiding principle of autonomy, which allows patients to make their own decisions about treatment (Sugiura et al., 2020). Consequently, there is a growing international policy momentum to reduce the use of coercive measures in psychiatry (see for example the initiative Fostering and Strengthening Approaches to Reducing Coercion in European Mental Health Services, https://fostren.eu) and recent research discussed prevention and reduction initiatives (Barbui et al., 2021; Gooding et al., 2020).

Second, there is a growing concern that such practices have a negative effect on patients, for both physical and mental health (Chieze et al., 2019; Kersting et al., 2019). In a recent systematic review focusing on physical harm and death, Kersting et al. (2019) showed that seclusion was associated with receiving less care and an increase in self-harm. This study nonetheless concluded that seclusion remained understudied. In another systematic review investigating associations between seclusion and psychological

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outcomes, Chieze et al. (2019) suggested that seclusion had deleterious consequences, including the development of post-traumatic symptoms, feelings of punishment, distress, and increased length of hospital stay.

Third, there is a lack of evidence-based evaluation of the clinical consequences of the use of seclusion. This has already been pointed out in the early 2000s (Finke, 2001), but conclusions are still relevant nowadays (Chieze et al., 2019). Few high-quality studies investigated the effect of coercive measures on patients' mental health outcomes. To our knowledge, three randomized controlled trials (RCTs) investigated the effect of coercive measures in psychiatric populations (Bergk et al., 2011; Huf et al., 2012; Vaaler et al., 2005), but none compared seclusion to a control condition without seclusion and limiting the risk of bias has been difficult in these studies (Chieze et al., 2019). Prospective observational studies investigating the effect of seclusion had severe limitations. It included cross-sectional designs, selection bias, lack of power, and lack of adequate confounding adjustment (Soininen et al., 2013; Whitecross et al., 2013).

Despites these important ethical controversies, coercive measures are still used in psychiatry, with potential large variations between countries and settings (Hotzy et al., 2018; Välimäki et al., 2019). There are potential favorable attitudes of some health care professionals toward the use of coercive measures (e.g., therapeutic effect of coercive measures) (Chieze et al., 2019; Doedens et al., 2019; Van Der Merwe et al., 2013).

Further studies with robust methods are thus needed to provide empirical evidence on the effects of seclusion. Most importantly, a better understanding of the consequences of seclusion on mental health outcomes is needed. This is especially true after the beginning of the SARS-CoV-2 pandemic, as seclusion has been elected as a way to quarantine SARS-CoV-2 cases (Lodhi & Marett, 2020).

To fill in these research gaps, we emulated a trial using observational data to investigate the effect of seclusion on mental health status. A trial emulation is a technique that mimics a RCT using observational data. It is used when RCT are not feasible or ethical and allows causal inference (Hernán & Robins, 2016). The primary outcome was the Health of the Nations Outcome Scales (HoNOS) at hospital discharge. As seclusion is a way to deal with aggression (Newton-Howes, 2013), we considered the first item of the HoNOS, which focuses on overactive, aggressive, disruptive, or agitated behavior, as a secondary outcome.

Methods

Study Design

The "target trial" is the RCT we would have designed if it was feasible and ethically acceptable. In our case, the target trial would randomly assign participants to either use of seclusion or nonuse of seclusion during hospitalization, at hospital admission. An overview of the target trial is provided in the first column of Table 1. We used observational data from medical files of the Geneva University Hospitals, Geneva, Switzerland, to emulate a target trial of the effect of seclusion on mental health status of adult patients hospitalized in psychiatric wards (see second column of Table 1). Participants were followed-up from admission to discharge.

Study Setting

The present trial is based on data collected for a larger study investigating the effects of the SARS-CoV-2 pandemic on hospitalization rates and use of coercive measures. Anonymized routine data were collected from the hospital's electronic files. The Geneva's cantonal ethics committee approved the study protocol (no. 2021-00263).

In the Geneva University Hospitals, the 14 inpatient wards of the department of psychiatry admit patients aged 18 or more, having severe mental illnesses. Most wards apply an open-door policy. There were around 1900 admissions in 2020 with a mean duration of stay of 24 days. We excluded three inpatient units that did not apply seclusion.

Following Swiss federal law, in the Geneva University Hospitals the use of seclusion is limited to the following situations: (1) imminent risk of aggressive behavior towards others, (2) behavior with a severe disruption of the ward community (putting others at risk), (3) exceptionally to prevent absconding with major risk of harm for self or others. Among these situations, imminent risk of aggressive behavior is the most frequent. Seclusion is only allowed when no other alternative is available to sufficiently reduce the risks. Acute suicide risk is a contraindication for the use of seclusion.

Eligibility Criteria

Patients were eligible for study participation if they did not decline reuse of their data for research purposes, were aged 18 or more, and were admitted in the adult and geriatric psychiatric wards of the Geneva University Hospitals between March (week 12) and December 2020 (week 52).

Exposure/Treatment

Participants were classified as being either secluded or nonsecluded during their hospital stay. Seclusion was defined as being locked in a room in case of endangerment of others, risk or absconding with endangerment of others or oneself, or severe disorganization that cannot be managed otherwise. Seclusion was coded as present (if used at least once during the hospital stay) or absent, without consideration of the duration or number of seclusion episodes.

Outcomes

Primary outcome. The total HoNOS score at discharge was the primary study outcome (score 0–48) (Wing et al., 1998).

Table 1. Description of the target trial emulation.

Component	Target Trial	Emulated Trial
Aim	To estimate the relative effect of seclusion on mental health status in patients hospitalized in adult psychiatry	Same
Design	Prospective open lab two parallel arm superiority randomized trial	Retrospective cohort study
Eligibility criteria	*Inclusion criteria*	*Inclusion criteria*
	Age ≥18	Same
	Being hospitalized in the adult psychiatric ward of the geneva university hospitals	Same
	Being hospitalized between Mar 2020 and Dec 2020	Same
	Exclusion criteria	*Exclusion criteria*
	Did not consent to participate	Refusal to reuse of data for research purposes
Treatment strategies	1) Use of seclusion during hospitalization 2) No use of seclusion during hospitalization	Patients are assigned to the group 1) or 2) if they were/were not secluded during their hospitalization
Assignment procedures	Participants randomly assigned to either strategy at hospital admission and aware of the strategy they are assigned to	Randomization is emulated via adjustment for all hypothesized confounding factors identified a priori
Follow-up	*Start:* Time of treatment assignment (admission) *Stop:* Hospital discharge	*Start:* Hospital admission *Stop:* Same
Outcomes	*Primary outcome:* HoNOS at discharge *Secondary outcomes:* Item 1 HoNOS at discharge	Same
Causal contrasts	ITT effect PP effect	Observational analogue of PP effect
Analysis plan	*ITT:* Compare means between randomized groups *PP:* Compare means between groups receiving/not receiving the treatment, with patients who deviate from protocol being censored and use of inverse probability weighting to adjust for baseline covariates and attrition	*PP:* Same as PP analysis

HoNOS: Health of the Nations Outcome Scales, ITT: Intention to treat, PP: per protocol.

Secondary outcome. The first item of the HoNOS at discharge, which rates symptoms related to overactive, aggressive, disruptive, or agitated behaviors, was used as a secondary outcome (score 0–4).

Confounding Factors

Important confounding factors were included in the study. A previous systematic review identified age, gender, ethnicity, psychiatric diagnoses, severity of symptoms, and psychiatric admission history as predicting factors of the use of coercive measures (Beames & Onwumere, 2022). Other studies reported that being single was also a predictive factor (Chieze et al., 2021a, 2021b).

Sociodemographic variables. Age, gender, nationality (Swiss versus other), and civil status (recoded as married or registered partnership versus single, divorced, or widower) were recorded.

Clinical variables. Previous hospitalizations in psychiatry (yes/no), unvoluntary admission (yes/no), psychiatric ward (adult versus geriatrics), duration of hospitalization (less than 3 weeks versus 3 weeks or more), and HoNOS at admission were recorded. Primary psychiatric disorders were also collected, defined according to ICD-10 (F0-F9) (WHO, 2004). As some disorders were rare in the sample, a principal component analysis was conducted to reduce the number of dimensions. The analysis suggested two categories of disorders: Schizophrenia, bipolar disorder, and personality disorders versus other disorders (dementia, mood disorders, anxiety disorders, intellectual disabilities, substance use disorders, and other disorders). The first category was described as a risk factor of seclusion in previous studies (Beames & Onwumere, 2022; Chieze et al., 2021a, 2021b).

Statistical Analyses

As this project was a sub-study of a larger project, no sample size was computed a priori. We computed a sensitivity power analysis to assess the minimum effect size the study could detect. With $n = 290$ in the secluded group, $n = 910$ in the non-secluded group, alpha = .05, power = .80, and a two-tailed independent t-test, the effect size was d = .19. Therefore, our study could identify small effect sizes.

We first computed preliminary statistics for the whole sample and for secluded versus non-secluded participants. Descriptive statistics were performed using percentages or means. Comparisons between groups with simple mixed-effect logistic regressions, as participants could have multiple hospital stays.

Then, to emulate the random assignment of the target trial and assess the average causal effect of seclusion on the outcomes, we used inverse probability (IP) of treatment weighting. The goal of IP weighting is to create a pseudo-population in which the treatment is not associated with identified confounders (Hernán, 2022). Stabilized IP weights were used. For this purpose, we first fitted a logistic regression model for the probability of being secluded with all potential confounders included as covariates (the ten sociodemographic and clinical variables described above, the HoNOS score at baseline and item 1 of the HoNOS at baseline). Fitted values were used as the denominator. Second, we fitted a saturated logistic model for the probability of being secluded without any covariate. These fitted values were used as the numerator to compute IP weights, so the probability of being assigned to a treatment strategy did not depend on the confounders. As there were missing values for the HoNOS at discharge, we also used stabilized IP weighting to account for attrition. The denominator was derived by fitting a logistic regression model for the probability of being not censored with all covariates, including seclusion. The numerator was derived by fitting a logistic regression model for the probability of being not censored with seclusion. The final IP weights were a multiplication of these two IP weights, adjusting for both confounding and attrition bias.

For both outcomes, we computed a linear regression model predicting the total HoNOS score/item 1 of the HoNOS at discharge with the treatment strategy (being or not secluded), controlling for covariates and using IP weighting for confounding and attrition bias (Benkeser et al., 2021; Hernán, 2022). As participants might have multiple hospital stays during the study period, we used robust standard errors to account for clustering. In a sensitivity analysis, we added an interaction term between the treatment strategy and severity of mental health at entry (HoNOS score or item 1 of the HoNOS at baseline). All analyses were performed with Stata 17.

Results

There was a total of $n = 1219$ hospitalizations during the study period. Nineteen participants were excluded because they had missing values on the HoNOS at hospital admission (1.6%), which left a final sample of $n = 1200$. At hospital discharge, 1164 participants had a completed HoNOS (retention rate = 97.0%). There were no other missing values.

Descriptive statistics and comparisons between groups are reported in Table 2. A total of 24.2% of the participants were

Table 2. Descriptive characteristics of the sample and comparisons between groups ($n = 1200$).

	Overall $n = 1200$	Secluded $n = 290$	Non Secluded $n = 912$	OR[a]	p[a]
Age	47.9 (20.9)	51.9 (21.6)	46.7 (20.6)	1.02	.001
Gender					
Men	48.4 (581)	48.6 (141)	48.4 (440)	Ref	-
Women	51.6 (619)	51.4 (149)	51.6 (470)	0.97	.88
Nationality					
Swiss	68.0 (816)	70.0 (203)	67.4 (613)	Ref	-
Other	32.0 (384)	30.0 (87)	32.6 (297)	1.15	.53
Civil status					
Married or registered partnership	19.7 (236)	20.3 (59)	20.3 (177)	Ref	
Single, divorced, widower	80.3 (964)	79.7 (231)	79.7 (733)	1.11	.67
Previous hospitalizations in psychiatry	68.9 (827)	70.3 (204)	68.5 (623)	1.18	.44
Unvoluntary admission	52.0 (624)	79.3 (230)	43.3 (394)	6.95	<.001
Psychiatric ward					
Adult	74.5 (894)	66.2 (192)	77.1 (702)	Ref	-
Geriatrics	25.5 (306)	33.8 (98)	22.9 (208)	2.25	.001
Duration of hospitalization					
Less than 3 weeks	54.8 (657)	35.2 (102)	60.9 (554)	Ref	-
3 weeks or more	45.2 (543)	64.8 (187)	39.1 (356)	4.27	<.001
Primary psychiatric disorder					
Other disorders	40.2 (482)	35.4 (103)	41.8 (380)	Ref	-
Schizophrenia, bipolar disorder, personality disorders	59.8 (718)	64.6 (188)	58.2 (530)	1.60	.03
HoNOS At admission	24.6 (6.7)	26.7 (6.1)	24.0 (6.8)	1.08	<.001
Item 1 HoNOS at admission	2.3 (1.4)	3.0 (1.0)	2.1 (1.4)	2.16	<.001
HoNOS At discharge (0–48) ($n = 1164$)	13.2 (6.3)	14.5 (6.6)	12.8 (6.1)	1.05	.001
Item 1 HoNOS at discharge (0–4) ($n = 1164$)	0.7 (1.0)	0.9 (1.1)	0.6 (0.9)	1.56	<.001

HoNOS: Health of the Nations Outcome Scales, OR: odd-ratio.
[a]Simple mixed-effect logistic regressions with the groups (secluded/non secluded) as the outcome variable.

secluded at least once during their hospital stay. Secluded participants were significantly older ($p = .001$), more likely to have an unvoluntary admission ($p < .001$), to be hospitalized in a geriatric psychiatric ward ($p = .001$), to be hospitalized for 3 weeks or more, ($p < .001$) to have higher HoNOS score (total score and item 1) at admission and discharge ($p < .001$), and to have schizophrenia, bipolar disorder or personality disorders than non-secluded participants ($p = .03$). They also had higher HoNOS scores at discharge (total score: $p = .001$, item 1: $p < .001$).

Results for the primary outcome (total score of the HoNOS) and secondary outcome (item 1 of the HoNOS) are reported in Table 3. Using IP weighting to account for confounding and attrition and controlling for baseline covariates, there were significant effects of seclusion on both outcomes. Participants who were secluded had a higher HoNOS score at discharge (1.49 point, 95% confidence interval [CI]: 0.56; 2.41, $p = .002$) compared to those who were not secluded. Participants who were secluded also had a higher score on the item 1 of the HoNOS at discharge (0.25, 95% CI: 0.05; 0.45, $p = .01$) compared to those who were not secluded.

In the sensitivity analyses, the interaction terms were not significant (HoNOS score: $p = .351$, item 1 of the HoNOS: $p = .693$, see Supplementary Table 1).

Discussion

This study used an emulated trial to test the effect of seclusion on mental health status, assessed with the HoNOS. The total HoNOS score at discharge was used as the primary outcome and the item 1 of the HoNOS (focusing on focusing on overactive, aggressive, disruptive, or agitated behavior) was used as the secondary outcome.

The main results showed that participants who were secluded during their hospital stay had the worst mental health status when they entered the hospital and when they left. At discharge, the total HoNOS and item 1 scores were respectively 1.49 and 0.25 points higher in the secluded group compared to the non-secluded group, controlling for the confounding and attrition biases with IP weighting. The model controlled for all baseline covariate, including the HoNOS score. Thus, although seclusion was likely targeting the most severely ill and aggressive patients, this intervention did not seem helpful in reducing the burden of symptoms. These results confirm previous studies' findings, which suggested a negative effect of coercive measures on mental health (Chieze et al., 2019; Kersting et al., 2019). Importantly, our study overcame previous methodological gaps, as it relied on a large sample size, a longitudinal design, and robust statistical methods controlling for the most important biases (Chieze et al., 2019).

However, even if the effect of the seclusion on mental health status was statistically significant, it was of small magnitude. Indeed, the HoNOS ranges from 0 to 48 points and item 1 from 0 to 4, which means that differences between groups were small. There is no established threshold regarding the clinical significance of HoNOS changes. Some authors have argued that an 8-point change might be considered as clinically relevant, while others argued for the use of a categorical approach, or a combination of both (Lay et al., 2021; Ronk et al., 2016). Of note, this 8-point change deals with an intra-individual change and not a between-group comparison, as performed in this study. There is also a debate as to the validity of the HoNOS as a unidimensional model capturing changes in mental health state. In our case, it is thus most probable that aspects related to the social and housing conditions of the patients have only been

Table 3. Estimation of the effect of seclusion on the HoNOS score ($n = 1164$).

	Outcome: HoNOS Score			Outcome: Item 1 HoNOS		
	Coefficient	p	95% CI	Coefficient	p	95% CI
Seclusion (ref. No)	1.49	.002	0.56; 2.41	0.25	.01	0.05; 0.45
Age	−0.01	.86	−0.04; 0.03	−0.01	.12	−0.01; 0.00
Gender (ref. Women)	0.73	.06	−0.03; 1.49	−0.12	.21	−0.30; 0.06
Nationality (ref. other than CH)	0.01	.98	−0.78; 0.80	0.05	.63	−0.15; 0.24
Civil status (ref. Single, divorced, widower)	−0.39	.42	−1.32; 0.54	−0.09	.44	−0.32; 0.14
Previous hospitalizations in psychiatry	1.48	.001	0.65; 2.32	0.24	.03	0.03; 0.45
Unvoluntary admission	−0.16	.70	−0.96; 0.65	0.14	.16	−0.05; 0.33
Psychiatric ward (ref. Adult)	0.23	.78	−1.33; 1.78	0.39	.04	0.02; 0.77
Duration of hospitalization (ref. Less than 3 weeks)	−0.57	.15	−1.32; 0.19	−0.10	.29	−0.28; 0.09
Primary psychiatric disorder (ref. other disorders)	−0.89	.03	−1.69; −0.10	0.01	.94	−0.19; 0.21
HoNOS at admission	0.40	<.001	0.33; 0.47	0.01	.06	−0.00; 0.03
Item 1 HoNOS at admission	−0.39	.01	−0.70; −0.09	0.29	<.001	0.20; 0.38

HoNOS: Health of the Nations Outcome Scales, CI: confidence intervals.
Linear regression model predicting the outcome at discharge with the treatment strategy (being or not secluded), controlling for covariates, using inverse probability weighting for confounding and attrition bias, and robust standard errors.

marginally improved during hospital stay. The negative effect of seclusion on mental health may effectively be small, but other reasons could explain this small magnitude. One reason was that we only assessed the presence or absence of seclusion, and not the number of seclusion episodes or the duration of seclusion. We therefore might have missed information on the intensity of seclusion, which may have an impact on patients' mental health status. However, even if the observed changes in total HoNOS and item 1 scores might be considered as clinically marginal, the fact that seclusion has a negative impact on patients' mental state should raise concerns.

Clinical Implications

Important implications for clinical practice can be drawn from this study. There is a need to inform about potential negative effects of seclusion on mental health, to raise awareness about its potential adverse consequences, and to develop alternative strategies.

A therapeutic effect of coercive measures is sometimes expected by medical or nursing staff (Chieze et al., 2019; Doedens et al., 2019; Van Der Merwe et al., 2013). This therapeutic effect was not observed in our study. On the contrary, there was a negative effect, with seclusion leading to increased aggressive and disruptive behaviors, as assessed with the item 1 of the HoNOS. As aggressive behaviors' management is an objective of the use of seclusion (Newton-Howes, 2013), our results suggest that it can be counterproductive.

We recommend a reduce the use of coercive practices and to strengthen alternative strategies, such as shared decision-making, environmental interventions, post-coercion review, de-escalation techniques, integration of peer workers, integrated care, and staff training (Barbui et al., 2021; Gooding et al., 2020; Hirsch & Steinert, 2019). We believe that a paradigm change is needed in psychiatric care.

Limitations

This study had some limitations. First, as mentioned above, seclusion was coded as present or absent during the hospital stay. Information on seclusion were not standardized in medical files and we therefore missed reliable information on the frequency and duration of seclusion. Other types of coercive measures were rare and were not analyzed. A larger range of coercive measures should be included in further studies, along with indications of frequency and duration over the hospital stay to provide a better overview of the impact of coercive measures on mental health.

Second, we could not exclude that some unmeasured confounding variables might have affect results, even if the most important predictors of the use of coercive measures were included to derive IP weights (Beames & Onwumere, 2022; Chieze et al., 2021a, 2021b). For example, we only controlled for baseline covariates. Some measures during hospitalization and prior to seclusion would have been useful to better control for confounding. Other measures related to mental health and behavior would have been useful, as those who were more severely ill at baseline were more likely to be secluded.

Third, there is a high variability between settings in the use of coercive measures (Flammer et al., 2022). Our monocentric study's findings may not be generalizable to other settings.

Fourth, the study took place during the SARS-CoV-2 pandemic, including periods of lockdown. The use of seclusion might have increased compared to the pre-pandemic period and findings should be interpreted in light of this context.

Conclusion

Overall, our findings confirmed that coercive measures such as seclusion had a negative effect of patients' mental health status, using an emulated trial that allowed causal inference. Seclusion should therefore be avoided in mental health care settings and training efforts should raise the awareness of the medical staff about potential adverse effects instead of therapeutic benefits.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This work was supported by the HUG Private Foundation.

Ethical Approval

The Geneva's cantonal ethics committee approved the study protocol (no. 2021-00263).

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Supplemental Material

Supplemental material for this article is available online.

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Journal of Psychiatric Research 130 (2020) 201–206

Contents lists available at ScienceDirect

Journal of Psychiatric Research

journal homepage: www.elsevier.com/locate/jpsychires

Correlates of seclusion and restraint of patients admitted to psychiatric inpatient treatment via a German emergency room

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ARTICLE INFO

Keywords:
Seclusion
Restraint
Coercion
Aggression
Acute psychiatry
Emergency psychiatry

ABSTRACT

Coercive measures in psychiatry are associated with negative consequences for both patients and staff. When it comes to preventing coercive measures, innovative models of care like the *Weddinger Modell* focusing on recovery, participation and supported decision-making have proven successful. However, observations from clinical practice show that emergency admissions to psychiatric facilities pose a great challenge in this regard and that most coercive measures take place during or shortly after emergency admission. This study retrospectively examined all cases ($N = 1477$) admitted to inpatient treatment at the Department of Psychiatry of the Charité at St. Hedwig Hospital in Berlin via the emergency room in 2018 aiming to identify patient characteristics that serve as predictors for coercive measures. Physical aggression, involuntary admission, police referral and younger age were found to be significant predictors ($p < .001$). Of 218 cases who experienced coercive measures, 81.2% (n = 177) were subjected to seclusion or restraint within the first 24 h of their hospital stay and 56.9% (n = 124) of cases only experienced coercive measures within these first 24 h and were not subjected to any coercive measures after. These results show that certain patient characteristics put individuals at higher risk of being secluded or restrained and that the risk of experiencing coercive measures is highest at the time during and shortly after emergency admission. To prevent coercive measures, it is crucial to target more resources and put in place measures specifically tailored to these emergency situations and the most vulnerable patient groups.

1. Introduction

Although controversially debated among practitioners and the scientific community, coercive measures such as seclusion and restraint are still common practice in mental health facilities worldwide (Gaskin et al., 2007; Martin et al., 2007; Sailas and Fenton, 2000; Wullschleger et al., 2018). While there is a substantial number of scholars and practitioners who regard coercive measures as a legitimate form of treatment, research has shown that such measures have adverse effects on both patients and staff.

In patients, experiencing coercive measures has been associated with negative consequences on recovery prospects and treatment satisfaction, self-stigma, lower use of outpatient resources and higher rates of subsequent involuntary admissions (Priebe et al., 2009; Theodoridou et al., 2012; Wullschleger et al., 2018). Furthermore, patients who have experienced coercive measures reported a deterioration of relationships and future professional perspectives (O'Donoghue et al., 2011; Wullschleger et al., 2018) and frequently experience symptoms of post-traumatic stress (Frueh et al., 2005; Sailas and Fenton, 2000). Staff frequently report that they experience the use of coercive measures as deeply distressing and that these measures contradict their role as caregivers (Theodoridou et al., 2012). These alarming findings prove the need for more research on how to effectively prevent seclusion and restraint and the readiness of practitioners to develop and implement alternatives to coercive measures in mental health care (Sailas and Fenton, 2000).

The use of coercive measures in psychiatry has been found to be significantly determined by structural, interpersonal and attitudinal variables (Bowers et al., 2010; Steinert et al., 2008; Suen et al., 2006). However, it has also been shown that some patient groups are more frequently subjected to coercive measures than others and that certain patient characteristics could serve as predictors for the use of seclusion

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https://doi.org/10.1016/j.jpsychires.2020.07.033
Received 30 April 2020; Received in revised form 18 July 2020; Accepted 22 July 2020
Available online 28 July 2020

and restraint in psychiatric settings (Sailas and Fenton, 2000; Steinert et al., 2007). In their systematic review, Sailas and Fenton (2000) conclude that the characteristics of patients who experience coercive measures differ widely between studies. However, previous research suggests that patients who are admitted to inpatient treatment involuntarily are secluded and restrained more frequently than voluntarily admitted patients (Georgieva et al., 2012; Tunde-Ayinmode and Little, 2004; Wullschleger et al., 2018). Furthermore, younger patients seem to be at a higher risk of experiencing coercive measures (Forquer et al., 1996; Georgieva et al., 2012; Keski-Valkama et al., 2010; Smith et al., 2005; Way and Banks, 1990). Also, numerous studies have found that physical aggression against persons or objects is a significant predictor for coercive measures during inpatient treatment (Steinert et al., 2007; Tunde-Ayinmode and Little, 2004).

In different studies on police referrals to psychiatric emergency services, researchers have further shown that patients who are referred by the police are at a higher risk of coercive measures than patients referred by other sources (Evans and Boothroyd, 2002; Maharaj and Andrew, 2011; McNiel et al., 1991). Other research suggests that patients' diagnoses can play an important role in the experience of coercive measures, namely that patients with psychotic disorders are at higher risk of being secluded or restrained than patients with other diagnoses (Betemps et al., 1993; Noda et al., 2013). Furthermore, acute alcohol or drug intoxications can play a significant role in the exhibition of aggressive behavior and therefore pose a challenge regarding the prevention of coercive measures in psychiatric emergency settings (Mahler et al., 2019; Verboket et al., 2019). This can be particularly challenging for staff as in different studies, acute alcohol and drug intoxications have been found to be among the most common diagnoses in these settings (Kropp et al., 2007; Puffer et al., 2012; Schoenfeldt-Leucona et al., 2017; Te Wildt et al., 2006).

In 2010, the Department of Psychiatry of the Charité at St. Hedwig Hospital (PUK SHK) in Berlin implemented the *Weddinger Modell*, an innovative model of psychiatric care focusing on recovery, participation, supported decision-making and the prevention of coercive measures (Mahler et al., 2014). A recent study by Czernin at al. (2020) has shown that with the *Weddinger Modell,* the frequency of coercive measures could be significantly reduced during the course of inpatient treatment. Among practitioners, the impression has emerged that coercive measures now primarily take place in and shortly after admission of patients via the emergency room (Czernin et al., 2020).

As more and more people are seeking the help of mental health professionals and a substantial number of psychiatric patients are admitted via emergency rooms (Kropp et al., 2007; Puffer et al., 2012), the question arises how these acute emergency situations can be accompanied differently to more effectively reduce coercive measures.

Taking a large sample of patients admitted to the emergency room at PUK SHK as an example, this study aims to identify characteristics of emergency admissions that can serve as predictors for the use of coercive measures in an inpatient psychiatric setting. Based on previous research in this field we hypothesize that police referral, physical aggression against persons or objects, involuntary admission, younger age, acute intoxication and a diagnosis with a psychotic disorder will be suitable predictors for coercive measures. Based on observations from clinical practice we furthermore hypothesize that coercive measures primarily take place within the first 24 h after admission to the emergency room.

This study will contribute to improving the psychiatric emergency admission process to better cater to the specific needs of certain most vulnerable patient groups with the aim of preventing coercive measures during admission and subsequent inpatient treatment.

2. Material and methods

2.1. Setting and sample

This is a retrospective study based on the review of medical records of patients admitted to inpatient treatment at PUK SHK via the emergency room. PUK SHK serves a catchment area of two urban districts (Wedding and Tiergarten) with roughly 485.000 inhabitants in central Berlin (Amt für Statistik Berlin-Brandenburg, 2019). At PUK SHK patients are treated on five different wards: three general psychiatric wards, one substance abuse ward and one Soteria ward. All cases who had been admitted to inpatient psychiatric treatment via the emergency room at PUK SHK during the year of 2018 were included in the analysis. If patients were admitted more than once during 2018, each admission was counted as a separate case.

2.2. Data collection

Data were obtained from the computerized clinical data information system (NexusKis) and were coded and collected using a data collection form. Variables obtained included demographic details, clinical details and information about the patients' referral to the emergency room. Demographic details included age and gender. Clinical details included diagnoses and details on coercive measures including whether or not the patient was subjected to seclusion or restraint during inpatient treatment as well as the time of occurrence of these coercive measures. Furthermore, it was recorded whether the patient had previously been admitted to the hospital in the same year. As details on patients' referrals, the mode of referral, reason for referral and legal basis for referral were recorded.

2.3. Definitions

To ensure reliability and validity of data, the following definitions of coercive measures and involuntary admissions were adopted for this study: Coercive measures were defined as (1) mechanical restraint, meaning the mechanical restriction of a patient's freedom of movement using special fixation straps and (2) seclusion, meaning the supervised isolation of patients in a special isolation room. Involuntary admission was defined through (1) provisional detentions, (2) detentions by court order according to the Mental Health Law of the State of Berlin (Berlin PsychKG) or (3) detentions initiated by patients' legal guardians, followed by court order according to the German Civil Code (Bürgerliches Gesetzbuch (BGB)) (Wullschleger et al., 2018).

2.4. Ethics

Permission for the retrospective data collection from patients' medical records was obtained prior to the study by the Ethical Committee of PUK SHK (EA1/151/19).

2.5. Statistical analysis

Chi-squared analyses were used to compare groups (experience of coercive measures yes/no) on bivariate and categorial variables: gender, police referral yes/no, physical aggression against persons or objects yes/no, diagnosis with psychotic disorder yes/no, acute intoxication yes/no, involuntary admission yes/no and readmission yes/no. For the continuous variable (age), an independent samples *t*-test was conducted. Furthermore, a Logisitic Regression analysis was used to identify the importance of each of the independent variables in predicting whether or not a patient will experience coercive measures during inpatient treatment. Calculations were performed with IBM SPSS Statistics (Version 23) and Microsoft Excel for Mac (Version 16.3).

3. Results

3.1. Sample population

A total of 2403 cases were treated in inpatient care at PUK SHK in the year 2018. Of these cases, a total of 1477 (61%) were admitted via the

emergency room and were included in the analysis for this study. 1110 individuals accounted for these 1477 cases. The majority of individuals (80.7%) were admitted only once during the study period. The remaining 19.3% were admitted multiple times (between two and sixteen times) during the study period. The sample consists of 835 (57%) male and 642 (43%) female cases. The average age of admissions was 42.1 years.

The most common mode of referral to the emergency room was by police ($n = 425$; 28.8%). 24.2% ($n = 358$) of patients presented alone, 15.9% ($n = 235$) were accompanied by the fire department, 14.5% (214) by emergency services. The remaining 16.6% ($n = 245$) were accompanied by family, friends or legal guardians.

For 11.7% ($n = 173$) of cases, physical aggression against persons or objects was recorded as reason for referral. Other reasons for referral were suicidal thoughts ($n = 377$; 25.5%), suicide attempt ($n = 24$; 1.6%), acute danger of self-harm ($n = 92$; 6.2%), general or mental health problems ($n = 520$; 35.2%), disorganization/helplessness ($n = 178$; 12.1%) and verbal threats ($n = 108$; 7.3%). Among the cases referred to the emergency room by the police, the most common mode of referral was physical aggression against persons or objects ($n = 142$; 33.4%) followed by verbal threats ($n = 83$; 19.5%) and suicidal thoughts ($n = 68$; 16%).

The most common main diagnoses were psychotic disorders (F2 diagnoses) ($n = 520$; 35.2%) and substance use disorders (F1 diagnoses) ($n = 408$; 27.6%). 324 cases (21.9%) were acutely intoxicated by alcohol or other substances upon admission and 676 cases (45.8%) were diagnosed with a comorbid substance use disorder in addition to their main diagnoses.

A total of 375 cases (25.4%) were admitted to inpatient treatment involuntarily either on a provisional basis, according to the Mental Health Law of the State of Berlin (Berlin PsychKG) or according to German Civil Code.

3.2. Use of coercive measures

Of the 1477 cases, 218 cases (14.8%) experienced coercive measures during their inpatient treatment. 81.2% ($n = 177$) of these cases were subjected to coercive measures within the first 24 h after admission and 56.9% ($n = 124$) of cases only experienced coercive measures within the first 24 h of their stay and were not subjected to any coercive measures after this timeframe.

Remarkably, 50.8% (n = 63) of cases that experienced coercive measures only within the first 24h of their stay were acutely intoxicated with alcohol or other substances.

3.3. Bivariate associations between patient characteristics and the use of coercive measures

Results of the bivariate analysis of patient characteristics and coercive measures are presented in Table 1.

Patients who were referred to the emergency room by police were significantly more likely to experience coercive measures than patients referred by other sources. Patients who had been admitted to the emergency room due to incidents of physical aggression against persons or objects were also more likely to experience coercive measures as were acutely intoxicated patients. Patients who were admitted to inpatient treatment involuntarily were significantly more often subject to coercive measures than patients who agreed to stay voluntarily.

Women were found to be restrained or secluded significantly less often than men and patients who were restrained or secluded were significantly younger than patients who did not experience coercive measures. Whether or not a person had previously been admitted to inpatient treatment via the emergency room at PUK SHK during the same year made no significant difference regarding the experience of seclusion or restraint.

Table 1
Bivariate associations between patient characteristics and the use coercive measures ($N = 1477$) (*p < .05. **p < .001).

	Coercive Measures			
	Absent ($n = 1259$) *n* (%)	Present ($n = 218$) *n* (%)	χ^2	*p*
Physical aggression against persons or objects				
no	1171 (93.0)	133 (61.0)	184.02	<.001**
yes	88 (7.0)	85 (39.0)		
Involuntary admission				
no	1075 (85.4)	27 (12.4)	522.75	<.001**
yes	184 (14.6)	191 (87.6)		
Police referral				
no	1011 (80.3)	41 (18.8)	342.87	<.001**
yes	248 (19.7)	177 (81.2)		
Age (M(SD))	42.7 (16.1)	38.8 (15.0)	3.30	<.001**
Acute intoxication				
no	1004 (79.7)	149 (68.3)	14.10	<.001**
yes	255 (29.3)	69 (31.7)		
Psychotic disorder				
no	835 (66.3)	122 (56.0)	8.74	<.001**
yes	424 (33.7)	96 (44.0)		
Gender				
male	698 (55.4)	137 (62.8)	4.15	0.04*
female	561 (44.6)	81 (37.2)		
Repeated admission				
no	947 (75.2)	163 (74.8)	0.02	0.89
yes	312 (24.8)	55 (25.5)		

3.4. Multivariate associations between patient characteristics and the use of coercive measures

A multivariate logistic regression model with occurrence of coercive measures (dichotomously yes/no) as dependent variable and the patient characteristics listed in Table 2 as independent variables was conducted. The used model was significantly predictive of whether or not patients were subjected to seclusion or restraint during inpatient treatment ($p < .001$). Age, police referral, involuntary admission and aggression against persons or objects were all significant predictors in this model, the independent variable acute intoxication reached marginal significance ($p = 0.10$).

The overall prediction rate of the model was 54,1%. Exponential B-values for predictors are presented in Table 2.

Table 2
Multivariate Associations between patient characteristics and the use of coercive measures (N = 1477) (*p < .05. **p < .001).

	EXP (B)	95% CI	P
Physical aggression against persons or objects	2.45	1.55, 3.88	<.001**
Involuntary admission	21.77	13.20, 35.89	<.001**
Police referral	2.78	1.74, 4.46	<.001**
Age	0.98	0.97, 0.99	<.001**
Acute intoxication	1.49	0.92, 2.41	0.10
Psychotic disorder	1.07	0.70, 1.64	0.75
Gender: female	0.77	0.52, 1.20	0.20
Repeated admission	0.77	0.45, 1.20	0.25

4. Discussion

4.1. Use of coercive measures

In the study sample, coercive measures were used in 14.8% (n = 218) of the 1477 cases admitted to psychiatric inpatient treatment via the emergency room at PUK SHK. This rate of coercive measure is comparable to numbers found in other German and international studies (Georgieva et al., 2012; Steinert et al., 2008). Remarkably, the vast majority (81.2% (n = 177)) of the 218 cases who experienced coercive measures, were subjected to coercive measures within the first 24 h of their hospital stay. Furthermore, 56.9% (n = 124) of cases only experienced coercive measures within the first 24 h of their stay and were not subjected to any coercive measures after. These results are in line with previous analyses showing that the majority of incidents of seclusion and restraint occur within the first days of hospitalization (El-Badri and Mellsop, 2002; Georgieva et al., 2012). They furthermore support previous research by Czernin et al. (2020) showing that by working with innovative models of care like the *Weddinger Modell*, the frequency of coercive measures could be significantly reduced during the course of inpatient treatment and that it is indeed the admissions situation where patients are at highest risk of experiencing coercive measures.

4.2. Patient characteristics associated with coercive measures

In this study, the occurrence of coercive measures among emergency admissions was best predicted by physical aggression against persons or objects, involuntary admission, police referral and younger age. Aggressive behavior as a significant predictor is not surprising since according to German Mental Health Law (PsychKG) and hospital guidelines at PUK SHK, acute aggressive behavior is a principal indication for the use of coercive measures. Furthermore, this finding is in line with numerous international studies that have identified aggression as a major predictor of coercive measures (Tunde-Ayinmode and Little, 2004; Steinert et al., 2007).

Involuntary admission as a significant predictor is furthermore not surprising and proves as a relatively stable risk factor for coercive measures across scholarly work in this field (Georgieva et al., 2012). In this regard, Georgieva et al. (2012) have found that perceived uncooperativeness plays a significant role in predicting seclusion and restraint among involuntarily admitted patients. Thus, interventions to prevent coercive measures among this patient group should focus on providing staff with tools and techniques on how to deal with uncooperative patients and solve disagreements without resorting to coercion. In this regard, an open and respectful attitude towards patients combined with recovery- and resource-oriented care and less focus on (involuntary) medication can be key.

Another group of patients who this study identified as being at high risk of experiencing coercive measures are police referrals. This finding supports several studies that focused on characteristics of police referred patients to mental health services (Evans and Boothroyd, 2002; Maharaj and Andrew, 2011; McNiel et al., 1991). The police are a major source of psychiatric emergency referrals around the world with studies finding that up to 53% of patients are brought in by police during the study period (Maharaj and Andrew, 2011). This study is in line with these findings as the police was the most common source of referral during the study period (28.8% (n = 425)). Police admissions are a controversial topic among mental health professionals and police authorities since clinicians often consider police referred cases as inappropriate and don't find a sufficient indication for inpatient mental health treatment (Fry et al., 2002; Maharaj and Andrew, 2011). Furthermore, police referrals are considered a highly challenging group for emergency psychiatric staff since they often exhibit aggressive or threatening behavior (Evans and Boothroyd, 2002; McNiel et al., 1991). Thus, in efforts to prevent coercive measures among this patient group, both the police and the emergency psychiatric staff play a crucial role and should closely cooperate.

This study also found that younger patients are at higher risk of being subjected to coercive measures. In this regard, previous studies have failed to show consistent results. Numerous studies have consistently identified young age as a risk factor for seclusion and restraint while other scholarly work has failed to find an association (Keski-Valkama et al., 2010). Some other research suggests that the association between age and coercive measures is more differentiated with younger patients being secluded or restrained more frequently but less long than older patients and younger patients being restrained more frequently whereas older patients experience seclusion more frequently (Keski-Valkama et al., 2010; Smith et al., 2005; Wynn, 2003). Thus, it would be interesting for further research to take a more dedicated look at the association between age and coercive measures in emergency psychiatric settings.

The significant bivariate effects of gender, acute intoxication and diagnosis with psychotic disorder did not hold up in the multivariate logistic regression analysis. Merely, acute intoxication reached marginal significance as a predictor. These results indicate that when it comes to the use of coercive measures, it might be more important to focus on situational factors than on fixed factors like patients diagnoses.

Since not only patient characteristics but also structural, situational and attitudinal variables have been proven to be predictive of the use of coercive measures, it should be a next step to conduct comprehensive prospective research on the interplay of these variables in order to identify a holistic model incorporating all these factors for predicting coercive measures in emergency settings. Such comprehensive research could further stipulate the development of proper risk assessment tools and guidelines for psychiatric staff and other authorities involved in emergency psychiatric admissions.

4.3. Practical implications of this study

This study shows that patients are highly vulnerable to experiencing coercive measures during and shortly after emergency admission and therefore proves the need for an adequate, person-centered approach to dealing with psychiatric emergency admissions and the need to develop and put in place more effective mechanisms to prevent coercive measures in these settings. Based on past research and extensive experience with the care of psychiatric emergency admissions, the authors recommend the following measures:

Firstly, it should be ensured that both emergency room staff and admitted patients are adequately supported and supervised during the emergency admissions process regardless of date and time of admission. This is especially crucial when a patient is admitted who is exhibiting the risk factors for coercive measures identified in this study. This support and supervision should be realized and coordinated by interprofessional teams that can be called in for support during the emergency admission of psychiatric patients. Such intensive support during a mental health crisis has been proven to have a de-escalating effect in psychiatric crisis response and can assure a proper risk assessment (Akademische Fachgesellschaft Psychiatrische Pflege, 2019). In this regard, the authors strongly oppose to the involvement of actors who are untrained in the mental health field like security services who are more likely to contain and restrain than to offer therapeutic interventions and de-escalation (Muir-Cochrane and Musker, 2015).

Secondly, the numbers of staff working in psychiatric and general emergency rooms should adequately reflect the number of admissions at any given time. Emergency rooms are oftentimes understaffed especially during night shifts (Riessen et al., 2015; Ohlbrecht et al., 2008) and these limited resources could make resorting to coercive measures a more likely scenario than in settings with enough emergency room staff and/or interprofessional crisis teams who have the resources to handle crisis situations more appropriately.

Thirdly, psychiatric inpatient units should work closely together with the police units responsible for their catchment areas. Since police

referred patients are at high risk of experiencing coercive measures, it is crucial to establish a joint effort of psychiatric staff and police officers when it comes to prevention. Police officers should be properly trained to ensure the respectful interaction and use of appropriate de-escalation techniques right from the point where they pick up a person to take them to psychiatric care. During admission at the emergency room, police and psychiatric staff should cooperate to ensure that the admission proceeds safely for staff and patient. Furthermore, police officers should stay at the emergency room until it is established that the referral was appropriate, i.e. that the medical staff found an indication for psychiatric treatment. If a patient is merely acutely intoxicated with alcohol or other substances and there is no further indication for psychiatric treatment, the police should cooperate with the psychiatric emergency staff to find an alternative to psychiatric hospitalization for these individuals. This is particularly important in light of the finding that 50.6% of cases who experienced coercive measures only in the first 24h of their stay at the hospital were acutely intoxicated.

4.4. Strengths and limitations of this study

Compared to other studies focusing on predictors of coercive measures, this study used a remarkably large sample (N = 1477). Furthermore, the study period covered a whole year and thus provides a representative overview of cases admitted to inpatient treatment at PUK SHK over a longer period of time. Due to the retrospective nature of the study and the reliance on previously gathered information in the medical records of patients, some variables that could have been interesting for this study such as history of trauma, lifetime history of coercive measures, cooperation and absence or presence of a support network could not be recorded. Furthermore, it would have been interesting to more thoroughly assess aggressive behavior and hostility using validated instruments and questionnaires.

In order to assess whether the data from PUK SHK are representative for other German and European psychiatric hospitals, the authors are currently planning further comparative studies into the subject matter.

5. Conclusion

Using a large sample of cases admitted to a German psychiatric emergency room, this study supports past research in the field of coercive measures in psychiatry, showing that certain patient characteristics are predictive of whether or not a person who is admitted to emergency psychiatric services will experience seclusion or restraint. These predictors are: involuntary admission, police referral, physical aggression against persons or objects and younger age. Acute intoxication seems to be associated with coercive measures, however, this variable only reached marginal significance in this study.

This study further shows that the majority of patients who experience coercive measures during their inpatient treatment, experience a coercive measure within the first 24 h of their hospital stay. A substantial part of these patients does not experience coercive measures after these first 24 h during further inpatient treatment. This shows that the time during and shortly after the acute emergency admission situation poses the greatest risk for patients as well as the greatest challenge for staff when it comes to coercive measures. The future challenge lies in putting in place measures and tools explicitly tailored to psychiatric emergency settings taking into consideration the characteristics of patients at high risk for experiencing coercive measures and in targeting more resources to the care of this highly vulnerable group.

Role of funding source

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRediT authorship contribution statement

Celline Cole: Conceptualization, Methodology, Formal analysis, Visualization, Writing - original draft. **Angelika Vandamme:** Conceptualization, Supervision, Writing - review & editing. **Felix Bermpohl:** Supervision, Writing - review & editing. **Klara Czernin:** Conceptualization, Writing - review & editing. **Alexandre Wullschleger:** Conceptualization, Supervision, Writing - review & editing. **Lieselotte Mahler:** Conceptualization, Supervision, Writing - review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Chieze et al. BMC Psychiatry (2021) 21:82
https://doi.org/10.1186/s12888-021-03095-4

BMC Psychiatry

RESEARCH ARTICLE Open Access

Prevalence and risk factors for seclusion and restraint in old-age psychiatry inpatient units

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Abstract

Background and objectives: Coercion in psychiatry is legally tolerated as a last resort. The reduction of the use of coercion is a shared goal of hospital administrators, medical and nursing staff and representatives of patients and families but requires the identification of risk factors for coercion. These risk factors in geriatric psychiatric inpatient settings are not well known, especially regarding seclusion. Through examining the prevalence of coercion and patients' characteristics, this study aims to identify risk factors for coercion in elderly people.

Methods: The use of coercion in the geriatric psychiatry division of Geneva University Hospital in 2017 was retrospectively analyzed. The incidence rate ratios were estimated with multivariable Poisson regressions to assess risk factors for coercion.

Results: Eighty-one of 494 patients (16.4%) experienced at least one coercive measure during their stay (mainly seclusion). The risk factors for coercion were younger age, male gender, being divorced or married, cognitive disorders, high item 1 of the Health of the Nation Outcome Scales (HoNOS) score (overactive, aggressive, disruptive or agitated behavior) at admission, previous psychiatric hospitalizations and involuntary referrals from the emergency department. Other disorders and global HoNOS scores were not associated with the use of coercion.

Conclusion: Higher risks of coercion were outlined in men with cognitive disorders, agitated behaviors, and previous psychiatric hospitalizations. They differed from those observed in younger adults in terms of age, civil status, disorders, global HoNOS scores and referrals. Therefore, geriatric psychiatric populations should be specifically investigated for the development of interventions aiming coercion reduction.

Keywords: Coercion, Restraint, Seclusion, Geriatric psychiatry, Risk factors

Introduction

Coercion – defined as any intervention limiting a patient's choice, autonomy or liberty of movement [1] – infringes upon fundamental human rights and therefore highlights legal and ethical issues [2, 3]. The use of coercion, which is legally tolerated as a last resort [2], is common in psychiatry, ordinarily to manage aggression and violence [4, 5]. The use of coercion is peculiarly contentious, as mental disorders can temporarily impair judgment capacity and hence make patients particularly vulnerable [6]. Because of the potential deleterious consequences of coercion, the worldwide trend is to prevent or at least diminish the use of coercion in psychiatry [7–10]. The main aim is to reduce the prevalence and duration of seclusion and restraint [11].

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Among the general psychiatric population experiencing coercive measures, the psychogeriatric population has been rarely studied to date. Moreover, the interpretation of the results of studies into clinical practice in this population are particularly difficult due to the methodological heterogeneity of the available studies, for example, regarding ages of inclusion [12, 13] or settings [14–16]. Although restraint is commonly the main analyzed coercive measure in elderly people [12, 17], the wide heterogeneity of practices used in this population have resulted in wide definitions of restraint, including, for example, the use of bedrails [18, 19]. Restraint prevalence in elderly people varies between 7.4 and 85% [20, 21]. The discrepancy depends mainly on the definition used for restraint and the study setting [22]. As a comparison, in general adult hospital care, the prevalence of restraint usually trends from 6 to 17% [23, 24]. To our knowledge, no study has specifically examined the use of seclusion in elderly people. A comparison of results could thus be problematic, as in Switzerland, as opposed to other countries, restraint is rarely used compared to seclusion [25]. These methodological issues render the interpretation of available data about the prevalence of coercive measures difficult, particularly considering the often contrasting results [21].

Regarding the risk factors for coercion in elderly people, it is important to underline that most studies do not specifically address the question of coercion in specific populations, such as elderly people; they only examine younger adult psychiatric populations [26, 27] or make no distinction between adult and geriatric populations [28, 29]. Some studies exclude patients with cognitive impairments [30, 31], which are preponderant in elderly people [18, 32]. In some studies, the relevant risk factors for coercion are organic mental disorders [33–35], older age [36, 37] and physical complications [38], three features associated with older populations. These results suggest a possible substantial difference in terms of the risk factors for coercion between adult and geriatric populations that needs to be investigated [12]. The inconsistency of the literature regarding this theme could thus come from the nondistinction between two noncomparable populations [25]. In the few studies available specifically concerning the risk of coercion in elderly people, the main risk factors for restraint (with or without seclusion) in elderly people were older age, cognitive impairment, disruptive behaviors (confusion, agitation, regression, screaming), wandering, high dependency in activities of daily living, reduced mobility, and history of falls [15, 16, 32]. Gender was usually not associated with the risk of coercion [12, 17]. The main reasons for using restraint were the prevention of falls, injuries or wandering; protection of medical devices; and management of disruptive behaviors [20, 39]. Aggression and violence were less common [14, 40], which contrasts with the adult psychiatric population in which aggressive behavior represents the main reason for using coercion [4, 5]. These discrepancies are arguments in favor of the significant differences between the two populations. As the clinical management of patients exposed to coercion may differ depending on the risk factors, those differences need to be assessed.

This study aims to determine the risk factors for coercion in the psychogeriatric population and to analyze its prevalence. Based on a previous study on patients hospitalized in the adult psychiatry division of Geneva University Hospital during 2017, this work also aims to compare the risk factors for coercion between geriatric and adult psychiatric populations [41]. This study should, therefore, help determine whether specific interventions should be implemented in psychogeriatric settings to reduce the use of coercion.

Material and methods

The present study uses the same retrospective design as described in a previous work [41].

Participant selection

Data on patients' sociodemographic and clinical features, hospital stays, and coercion prescriptions were retrospectively collected from electronic patient files and anonymized.

Patients hospitalized in the geriatric psychiatry division of the Geneva University Hospital between 1 January and 31 December 2017 were included. Patients admitted before 1 January or discharged after 31 December 2017 were also included.

The four wards of this division offer inpatient care for patients older than 65 years. Three of these units provide acute care; one of them is specifically dedicated to patients with cognitive disorders. The doors of these three wards are continuously closed. The fourth unit provides postacute care and conforms to an open-door policy, with the main door being opened from 8 am to 8 pm and without special surveillance of the ward exit. Opening on request is available from 8 pm to 8 am. Concerning the use of coercion, the division's guidelines prioritize the use of seclusion and forced medication rather than a four- or five-point mechanical restraint, which is only applied in extraordinary circumstances. Other forms of restraint are occasionally used in our geriatric psychiatry division, such as seatbelts, holding seat tables, and abdominal bed holding belts. Coercion also includes bedrails and patient antiwandering devices (alarm mats, wristband transmitters).

Data collection

Since 1 January 2017, coercive measures – clustered as seclusion, restraint (five-point belts, immobilization, seatbelts, ankles and wrists fasteners, chair tables, waistbelts, bedrails) or other forms (forced medication, manual restraint, anti-wandering devices) – have been directly prescribed in patients' electronic health records. We automatically extracted the number of times coercive measures were prescribed from these electronic files. This extraction, due to the way the prescriptions were made, did not permit to distinguish between emergency forced medication and forced treatment under Article 434 of the Swiss Civil Code (dispensed outside of an acute emergency in case of a severe threat to the patient's health or others' life or integrity without treatment) [42]. We adopted the occurrence of at least one coercive measure as the main (dependent) outcome. When seclusion and restraint were both used during one hospital stay, we decided to allocate them to the restraint cluster, as it is regularly reported as more constraining and traumatic than seclusion [43–45]. The literature also suggests studying the combination of different coercive measures [46], but the small number of restraint measures did not allow for cluster analyses.

Some patients were hospitalized several times during the year and/or were prescribed several coercive measures during one hospital stay, meaning the data were dependent. Thus, we distinguished patient-related from stay-related variables.

Gender, age, civil status (single, married, separated/divorced, widowed), nationality (Swiss/foreign), number of previous stays during the year (1, 2, 3 and more), and the presence (yes/no) and number of previous psychiatric hospitalizations were considered patient-related variables. Stay-related variables included the source of the hospitalization decision (outpatient center or private physician practicing outside of the hospital, hospital physician, emergency department, other), main diagnosis (organic/neurologic (F0/G2-G3) [47], psychotic (F2), bipolar (F30–31), depressive (F32–33), personality (F6), anxious and behavioral disorders (F4-F5), substance use (F1), other diagnoses (developmental (F7-F8) and other)), number of days spent in the hospital in 2017 and admission status (voluntary/involuntary). The Health of the Nation Outcome Scales (HoNOS) scores at admission and discharge were examined to assess the burden of symptoms [48]. The first item on this scale rates symptoms of overactive, aggressive, disruptive or agitated behaviors. This item was, therefore, chosen to analyze the influence of violence on the use of coercion.

Data analysis

For the descriptive analyses, a non-normal distribution was presumed for quantitative variables, and a Kruskal-Wallis rank-sum test was performed to compare groups. Regarding the qualitative variables, expected frequencies higher or lower than five determined the use of Pearson's chi-squared test or Fisher's exact test, respectively.

To identify the risk factors for coercion, we used multivariable Poisson regressions. When there were missing data, multiple imputations with chained equations were performed (50 imputations sample). The global incidence rate (IR) represented the number of hospitalization days with at least one coercive measure out of 365 hospitalization days. The significant variables from the descriptive analyses were used to obtain incidence rate ratios (IRRs) (or the ratio of the rate of coercion prescriptions per timeframe). IRRs significantly higher (or lower) than 1 in the exposed cluster indicate an increased (or reduced) risk of coercion. Nonsignificant or potentially redundant variables were not retained for the multivariable analyses (the HoNOS scores at discharge, number of previous stays during the year, existence of previous psychiatric hospitalizations, nationality).

R software for statistics, version 3.6.1, was used for statistical analyses. The significance threshold was $P < 0.05$.

Human participant protection

The study was approved by the Swiss Ethics Committee on Research Involving Humans of Geneva (No. 2018–00988).

Results

Descriptive analyses (Table 1)

In 2017, 16.4% ($n = 81$) of the patients hospitalized in Geriatric Psychiatry experienced at least one coercive measure. At least one coercive measure was prescribed in 16.8% ($n = 102$) of the hospital stays. At the hospital stay level, seclusion was the most prescribed coercive measure (77.4%), followed by restraint (16.7%). Forced medication or other coercive measures accounted for 5.9% of the prescribed measures. Restraint prescriptions included bedrails ($n = 6$; 35.3%), chair-tiding ($n = 6$; 35.3%), bed-tiding ($n = 4$; 23.5%) and immobilization ($n = 1$; 5.9%).

Group comparisons showed that men ($n = 49$ (60.5%) vs. $n = 158$ (38.3%)) as well as married patients (43 (53.1%) vs. 141 (34.1%)) were overrepresented among patients who experienced coercion. Patients experiencing coercion also spent more time in the hospital in 2017 (58.10 vs. 35.82 days). Considering clinical factors, organic ($n = 30$ (41.7%) vs. $n = 139$ (31.2%)) and bipolar ($n = 17$ (23.6%) vs. $n = 43$ (9.6%)) disorders were overrepresented among stays with at least one coercive measure. Involuntary admission was more common in stays with coercion ($n = 76$ (74.5%) vs. $n = 260$ (51.6%)). The mean

Table 1 Descriptive analyses

	No Coercion	Coercion	Test	*p*-value
Patient-related Variables				
N = 494 (%)	413 (83.6)	81 (16.4)		
Gender = male (%)	158 (38.3)	49 (60.5)	12.86[a]	**< 0.001**
Age (year) (median [IQR])	77.00 [70.00, 84.00]	79.00 [73.00, 84.00]	3.44[b]	0.064
Civil status (%)			**12.53**[a]	**0.006**
Single	77 (18.6)	8 (9.9)		
Married living as a couple	141 (34.1)	43 (53.1)		
Separated/divorced	103 (24.9)	12 (14.8)		
Widowed	92 (22.3)	18 (22.2)		
Nationality = Swiss (%)	313 (75.8)	53 (65.4)	3.26[a]	0.071
No. of hospital stays in 2017 (%)			Fisher[c]	0.30
1	345 (83.5)	63 (77.8)		
2	51 (12.3)	15 (18.5)		
3+	17 (4.1)	3 (3.7)		
Total no. of psychiatric hospitalizations (median [IQR])	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.0085[b]	0.93
Previous psychiatric hospitalization = yes (%)	165 (40.0)	31 (38.3)	0.025[a]	0.87
Total hospitalization duration in 2017 (days) (median [IQR])	35.82 [17.70, 66.47]	58.10 [25.91, 111.01]	**14.27**[b]	**< 0.001**
Hospital stay-related Variables				
N = 606 (%)	504 (83.2)	102 (16.8) (79 seclusion (77.4) 17 restraint (16.7) 6 else (5.9))		
Hospitalization decision (%)			Fisher[c]	0.20
Outpatient center or private physician	203 (40.3)	31 (30.4)		
Hospital physician	113 (22.4)	23 (22.5)		
Emergencies	183 (36.3)	47 (46.1)		
Other	5 (1.0)	1 (1.0)		
Main diagnosis (%)			**Fisher**[c]	**< 0.001**
Organic/neurologic disorders	139 (31.2)	30 (41.7)		
Substance use	10 (2.2)	2 (2.8)		
Psychotic disorders	55 (12.3)	8 (11.1)		
Bipolar disorders	43 (9.6)	17 (23.6)		
Depressive disorders	127 (28.5)	6 (8.3)		
Anxious and behavioral disorders	51 (11.4)	4 (5.6)		
Personality disorders	16 (3.6)	2 (2.8)		
Other	5 (1.1)	3 (4.2)		
Involuntary admission = yes (%)	260 (51.6)	76 (74.5)	**17.13**[a]	**< 0.001**
Admission HoNOS (median [IQR])	17.00 [11.00, 22.00]	21.50 [15.25, 27.00]	**24.45**[b]	**< 0.001**
Discharge HoNOS (median [IQR])	9.00 [5.00, 14.00]	12.00 [6.00, 19.75]	**10.01**[b]	**0.002**
Admission HoNOS item 1 (median [IQR]) (overactive, aggressive, disruptive or agitated behavior)	1.00 [0.00, 3.00]	3.00 [2.00, 4.00]	**53.09**[b]	**< 0.001**
Discharge HoNOS item 1(median [IQR])	0.00 [0.00, 0.00]	1.00 [0.00, 2.00]	**35.10**[b]	**< 0.001**
Stay duration (days) (median [IQR])	29.92 [15.74, 54.59]	52.22 [24.63, 94.17]	**23.37**[b]	**< 0.001**

Abbreviations: *IQR* Interquartile Range, *No.* Number, *HoNOS* Health of the Nation Outcome Scales
[a]Pearson's Chi-squared test; [b]Kruskal-Wallis rank-sum test; [c]Fisher's exact test

Table 2 IRR per geriatric psychiatric hospital stay per year with multiple imputations

	IRR	95% CI	*p*-value
Gender = male	3.13	[2.77, 3.77]	**< 0.001**
Age (year)	0.96	[0.96, 0.96]	**< 0.001**
Civil status			
Single	1		
Married living as a couple	1.62	[1.25, 1.90]	**< 0.001**
Separated/divorced	2.04	[1.63, 2.51]	**< 0.001**
Widowed	1.11	[0.81, 1.49]	0.50
Total no. of psychiatric hospitalizations	1.06	[1.06, 1.07]	**< 0.001**
Hospitalization decision			
Outpatient center or private physician	1		
Hospital physician	0.99	[0.77, 1.26]	0.96
Emergencies	2.82	[2.43, 3.44]	**< 0.001**
Other	0.54	[0.08, 1.56]	0.40
Main Diagnosis			
Depressive disorders	1		
Organic/neurologic disorders	1.30	[1.27, 1.34]	**0.026**
Substance use	0.46	[0.18, 0.53]	**0.0037**
Psychotic disorders	0.60	[0.33, 0.68]	**0.0067**
Bipolar disorders	1.01	[0.96, 1.75]	0.93
Anxious and behavioral disorders	0.49	[0.15, 0.53]	**0.0099**
Personality disorders	0.66	[0.64, 0.68]	**0.011**
Other	1.19	[0.63, 2.72]	0.63
Involuntary admission = yes	2.88	[2.25, 3.22]	**< 0.001**
Admission HoNOS	0.99	[0.99, 1.01]	0.20
Admission HoNOS item 1 (overactive, aggressive, disruptive or agitated behavior)	1.39	[1.23, 1.41]	**< 0.001**

Abbreviations: *IRR* Incidence Rate Ratio, *CI* Confidence Intervals, *No.* Number, *HoNOS* Health of the Nation Outcome Scales

duration of stay was also longer when at least one coercive measure occurred (52.22 vs. 29.92 days). The mean global and item 1 HoNOS scores at admission and discharge were higher in cases of coercion (global score at admission: 21.5 vs. 17.0; at discharge: 12.0 vs. 9.0; item 1 score at admission: 3.0 vs. 1.0; at discharge: 1.0 vs. 0.0).

Multivariable analyses (Table 2)

The global incidence rate (IR) was 12.5 per hospital stay year, meaning that from a total of 365 days of hospitalization, coercion was prescribed on 12.5 days on average (95% CI [11.8, 13.3]).

Demographic risk factors

After adjusting for other variables, men were shown to be at higher risk of being subject to coercion than women (IRR 3.13 [2.77, 3.77]). Age was associated with a reduced risk of coercion (IRR 0.96 [0.96, 0.96]). The risk of coercion was higher in separated/divorced and married patients living as a couple than in single patients (IRRs 2.04 [1.63, 2.51] and 1.62 [1.25, 1.90], respectively). The risk of coercion increased with the number of previous psychiatric hospitalizations (IRR 1.06 [1.06, 1.07]).

Clinical risk factors

Compared to referrals from an outpatient physician, being hospitalized from the emergency department was associated with a higher risk of coercion (IRR 2.82 [2.43, 3.44]). The risk of coercion was significantly higher in diagnoses of organic disorders than depressive disorders (IRR 1.30 [1.27, 1.34]). A reduced risk of coercion was observed in diagnoses of substance use as well as psychotic, anxious and behavioral and personality disorders (IRRs 0.46 [0.18, 0.53], 0.60 [0.33, 0.68], 0.49 [0.15, 0.53], 0.66 [0.64, 0.68], respectively). Bipolar disorders were not significantly associated with a risk of coercion compared to depressive disorders. The risk of coercion was higher in case of involuntary admission (IRR 2.88 [2.25, 3.22]) and was correlated with higher item 1 HoNOS

scores at admission (IRR 1.39 [1.23, 1.41]). The Global HoNOS scores at admission were not associated with the risk of coercion.

The main findings are summarized in Table 3.

Discussion

In 2017, 16.4% of patients experienced at least one coercive measure during their hospitalization in geriatric psychiatry. Considering demographic factors, the risk of coercion was correlated with male gender, younger age and a history of previous psychiatric hospitalizations. Separated/divorced or married patients were at higher risk of coercion than single patients. Regarding clinical risk factors, referrals from the emergency department, involuntary admission, high item 1 HoNOS scores at admission and a diagnosis of cognitive disorder were associated with a higher risk of coercion. Diagnoses of psychotic, anxious or personality disorders were associated with a lower risk of coercion. This risk was not influenced by a diagnosis of bipolar disorder or the global HoNOS scores at admission (Table 3).

The prevalence of the patients experiencing coercion in our geriatric psychiatric division was 16.4%, which is consistent with the literature, as the known proportion is approximately 7.4–20% in acute geriatric care hospitals [21]. This result is also similar to our findings in the nongeriatric adult population at the same hospital [41].

Male gender was associated with a higher risk of coercion in our sample than female gender, a finding that differs from previous psychogeriatric studies [12, 17] but is consistent with our findings among the adult psychiatric population [41]. It is possible that men exhibit more violent behaviors and/or induce more fear in staff.

The risk of coercion decreased with age in our sample, which diverges from previous works identifying older age as a risk factor for restraint in the geriatric population [12, 15]. In adult populations and similar to our present study, younger age was correlated with an increased risk of coercion in some publications [24, 49], whereas other studies, including our previous work, found no association between age and coercion in adults [25, 41, 50]. In younger patients, coercion is mostly used to manage aggression and violence [4, 5], whereas in elderly patients, the main reasons for coercion seem to be disruptive behavior and fall prevention, often in association with cognitive disorders [16, 39]. The same intervention – coercion – seems therefore to be used for two different purposes, suggesting that there are two substantially distinct populations that need to be studied separately.

In our study, divorced or married patients were at higher risk of coercion than single patients. Reliable inferences at this stage are difficult to establish, with highly divergent results in the literature [24, 45, 51]. As a comparison, we found a lower risk of coercion in married or divorced adult patients [41]. Civil status in elderly people seems differently associated with coercion compared to that in adults. A hypothesis could be that cognitive disorders can have behavioral disturbances with a relational manifestation, such as agitation and aggression with relatives. These symptoms may lead to coercion. Another hypothesis could be that single patients more often live in protected environments or in nursing homes and therefore require less hospital care.

The risk of coercion increased with the number of previous psychiatric hospitalizations, suggesting a higher risk of coercion in cases with more severe disorders [50, 52]. This result is similar to our findings in adults [41].

Consistent with other studies, our results showed that cognitive disorders were the only diagnosis-related risk factor for coercion in geriatric psychiatric populations –

Table 3 Key messages

Descriptive analyses

- 16.4% of the geriatric psychiatric patients with at least one coercive measure

Compared to non-coerced patients:

- Increased hospitalization duration
- Significantly more likely to be male
- Significantly different civil status (mainly married patients living as a couple (53.1%))
- 16.8% of hospital stays with at least one coercive measure, mainly seclusion (77.4%)
- Organic (41.7%) and bipolar (23.6%) disorders as the most frequent diagnoses
- Hospitalization decision mostly originated from the emergency department (46.1%) in case of hospital stays with coercive measures
- Higher global and item 1 admission HoNOS scores

Multivariable analyses

Increased risk of coercion in:

- Men
- Separated/divorced or married patients living as a couple compared to single patients
- Higher number of previous psychiatric hospitalizations
- Higher item 1 admission HoNOS scores (overactive, aggressive, disruptive or agitated behavior)
- Organic disorders diagnosis compared to depressive disorders
- Hospitalization decision from the emergency department compared to an outpatient center's or private physician's decision

Reduced risk of coercion in:

- Older age
- Diagnoses of substance use as well as psychotic, anxious and behavioral, and personality disorders compared to a depressive disorder

Global admission HoNOS scores were not a significant risk factor for coercion, nor was a diagnosis of bipolar disorder compared to a depressive disorder or being widowed compared to being single.

using depressive disorders for comparison [12, 53]. Cognitive disorders are indeed more common in elderly people and alter their judgment capacity as well as their behavior, leading to the need for coercion. Opposite to what was found in adult populations, diagnoses of psychotic or bipolar disorders were not associated with a higher risk of coercion in this population [25, 43, 54]. Moreover, our previous results in adults showed a higher risk of coercion among patients suffering from substance use and personality disorders, whereas these risks were reduced in geriatric patients [41]. Patients suffering from substance use or a personality disorder tend to present less aggressive symptoms when their age increases [55, 56].

Referrals from the emergency department were associated with an increased risk of coercion in elderly people. Confusional states can lead to disruptive behaviors and thus to coercion [18, 32]. In such states, the somatic etiology needs to be excluded, which could explain the visit to the emergency service before hospitalization in geriatric psychiatry. A similar rationale could be applied to falls and the need for a somatic examination as well as the use of coercion as a prevention during hospitalization. Other studies in adult populations have reported comparable results [25, 57]. Our study in adults, however, showed no association with referrals from the emergency department [41].

In this study, the risk of coercion increased with the item 1 rating on the HoNOS at admission. This result was similar in adults [41]. Despite the discrepancies in disorders impacting the risk of coercion differently between the two populations, the symptoms rated by the first item of the HoNOS (overactive, aggressive, disruptive or agitated behaviors) seem to be good predictors of the risk of coercion for both populations and should thus be systematically evaluated in practice. The global HoNOS scores at admission were however not significantly associated with a risk of coercion in elderly people. Another study showed that the HoNOS score was not predictive of the use of seclusion in cases of cognitive disorders [58], whereas the global admission scores were predictors of coercion in adults [41]. Cognitive disorders, which are prevalent in elderly people could thus hinder the pertinence of the global HoNOS to predict the risk of coercion in psychogeriatric populations.

Implications for clinical practice

Decreasing the use of coercion in elderly people requires an awareness of the associated specific risk factors. This awareness can serve in clinical practice as an indicator for patients who require special attention to avoid coercion. It should also lead to the development of interventions tailored to deal with these specific clinical factors. The present work should be considered a first step towards the implementation of such new interventions.

As mentioned before, the lack of publications focusing on seclusion – the most used coercive measure in our hospital – in this population renders comparisons between studies somewhat difficult. We can still contrast some of our results with the known literature, as parallels between restraint and seclusion can be drawn. Prevention of falls and injuries and management of disruptive behaviors are the principal reasons for using restraint in elderly people [17, 59]. As a parallel, the present study shows that the risk factors for seclusion are mainly cognitive disorders and agitated behaviors. Restraint is also known to be a risk factor for confusion, agitation, and risk of falls, reasons often evoked to justify its use [40, 60, 61]. Similarly, it can be clinically argued that secluding a patient suffering from cognitive disorders could lead to the risk of increasing confusion and agitation through loss of orientation and isolation. These two coercive methods seem, therefore, to have similar risk factors and side effects and might not be the most appropriate to treat elder patients with cognitive impairment [32, 60].

Alternatives and oriented interventions to decrease the use of coercion in the older population are thus more than needed [18, 62]. Interventions directly targeting the symptoms of disorientation and/or derealization that increase the risk of disruptive behaviors among patients suffering from cognitive impairments might be interesting and promising alternatives. For example, architectural changes in wards, such as multisensory rooms or senses-based interventions, including Snoezelen therapy or a "controlled multisensory environment," aimed at alleviating the symptoms of disorientation and/or derealization through sensory stimuli seem promising [63, 64]. Including a patient's relatives in clinical discussions and decisions is also an alternative for the care of patients with cognitive impairments [61, 65]. Regarding staff, some studies examining geriatric care have found that specific staff training in geriatrics and psychiatry sensitizes nurses to cognitive impairment management and thus helps reduce the use of restraint [16, 39].

Strengths and limitations

To our knowledge, the present study is the first to analyze the risk factors of coercion in geriatric psychiatric units using mainly seclusion. The relevant demographic and clinical features that contribute to the use of coercion are emphasized here, which will help develop oriented interventions aiming at reducing coercion. This study on elderly patients follows a similar one in adults using the same methodology. Comparison between the two studies is, therefore, reliable and brings to light

significant differences in the risk factors for coercion between the two populations.

The limitations of this study involve the accessibility of some data concerning staff- and environmental-related levels of risk factors for coercion. Regarding patient-related factors, some variables could be of interest, such as the level of education, spoken language and origin, but these data were not yet available. The descriptive analysis suggests that Foreign compared to Swiss nationality may be associated with an increased risk for coercion. However, this result should be interpreted was caution, because the effect was small and reached only trend-level significance. Furthermore, in order to contextualize the nationality status information on spoken language and origin would be needed, which were not available in our database. Another patient-related variable that was not available concerns size and physical stature. A recent study on nurses suggests that differences in stature between patients and nurses may have an impact on the feeling of safety and use of coercive measures [66]. Data regarding the staff- and institutional-related variables were not included in this study, first due to data availability and second because the present work mainly focuses on patients' characteristics. Future studies are planned to specifically investigate the role of these variables, including staff/patient ratios, day and time (nights and weekends) of coercion prescriptions.

Conclusions

The present work outlined higher risk of coercion among men with cognitive disorders, agitated behaviors, and previous psychiatric hospitalizations. It also highlighted the differences in the use of coercion compared to younger adults, especially regarding age, civil status and diagnostic and clinical factors. These results support the specificities of the geriatric psychiatric population and indicate the need for further research investigating the clinical processes leading to the use of coercion in the elderly. This study clearly states that specific clinical interventions are needed to offer alternatives in the management of critical situations in this population and to effectively reduce the use of coercion.

Abbreviations

CI: Confidence intervals; HoNOS: Health of the Nation Outcome Scales; IQR: Interquartile range; IRR: Incidence rate ratio; No.: Number; Vs.: Versus

Acknowledgments

We thank Mr. Joël Danielian and Ms. Anne Bardet-Blochet of the Department of Psychiatry as well as Ms. Sandrine Baujard of the Finance Department of the University Hospital of Geneva for their precious assistance in permitting the data collection and extraction.

Authors' contributions

MC participated in the global project of this study (search question and strategies, data extraction and analysis, manuscript redaction). SH and OS helped develop the search question and strategies, extracted the data and revised the manuscript. SK and AW oversaw the project, participated in the data analysis and redacted the manuscript. DC contributed to the development of the search strategies, provided mentoring regarding the data analysis and revised the manuscript. JF helped with the specific analysis in a geriatric setting and revised the manuscript. The manuscript has been approved by all the authors.

Funding

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

Availability of data and materials

The anonymized data and the research protocol that support the findings of this study are available on request from the corresponding author, MC. The data are not publicly available due to their containing information that could compromise the privacy of research participants.

Ethics approval and consent to participate

This human study including retrospective data have been approved by the appropriate ethics committee, the Swiss Ethics Committee on Research Involving Humans of Geneva (No. 2018–00988) and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments. As only anonymized retrospective data with an automatic extraction were used, the informed consent waiver was obtained from the Swiss ethics committee of Research Involving Humans of Geneva (protocol available).

Competing interests

The authors declare that the research was conducted in the absence of any commercial or financial partnership that could be considered as a potential conflict of interest. Dr. Chieze and the coauthors have nothing to disclose.

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Received: 21 December 2020 Accepted: 29 January 2021
Published online: 08 February 2021

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Publisher's Note

European Archives of Psychiatry and Clinical Neuroscience (2021) 271:1077–1087
https://doi.org/10.1007/s00406-020-01215-x

ORIGINAL PAPER

Effect of standardized post-coercion review session on symptoms of PTSD: results from a randomized controlled trial

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Received: 27 May 2020 / Accepted: 7 November 2020 / Published online: 24 November 2020

Abstract

Objective Post-coercion review is increasingly regarded as a mean to reduce the negative consequences of coercive interventions, including the development of posttraumatic symptoms. However, the efficacy of this intervention in preventing posttraumatic symptoms or PTSD has not been sufficiently studied. The objective of this study is to examine the influence of a single, standardized post-coercion review session on the development or exacerbation of PTSD symptoms in patients with psychotic disorders.

Methods In a multi-center, two-armed, randomized controlled trial, patients who experienced coercive interventions during current hospitalization were either randomized to standard treatment or an intervention group receiving a guideline-based, standardized reflecting review session. Factorial MANCOVA and subsequent ANCOVAs investigated the effects of the post-coercion reflecting review session on post-traumatic symptoms as measured by the subscales of the Impact of Events Scale-Revised (IES-R). Similarly, the effect of the intervention on the intensity of the peritraumatic reactions measured by the Peritraumatic Distress Inventory (PDI) was analyzed by conducting a factorial ANCOVA.

Results $N = 82$ patients were included in an intention-to-treat analysis. MANCOVA and post hoc ANCOVAs revealed a significant main effect of the intervention for the IES-R subscales intrusion and hyperarousal, when controlling for levels of peritraumatic distress, whereby intervention group participants presented lower respective mean scores. There was no significant difference regarding the intensity of the peritraumatic reaction.

Conclusion Standardized post-coercion review contributes to a reduction of the burden of PTSD symptoms in patients with psychotic disorders experiencing coercive interventions in acute settings and shall be recommended as a measure of trauma-informed care.

The trial was registered at ClinicalTrials.gov (ID NCT03512925) on 01/30/2018 (retrospectively registered).

Keywords Post coercion review · Coercion · PTSD · Trauma · Psychosis

Introduction

Coercion in psychiatric care has been increasingly the focus of clinical and scientific attention, mainly due to legal, ethical and clinical issues raised by the use of coercive measures such as mechanical restraint or seclusion. Although their life-saving potential is undisputed in emergency scenarios such as a delirium tremens, their use should be restricted to situations in which other alternatives have been exhausted [1]. Moreover, the known potential consequences of coercion on clinical outcomes, therapeutic relationship or satisfaction with care render the need to reduce their application urgently [2].

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Concurrently, the presence and management of trauma experiences and related post-traumatic stress disorder (PTSD) among patients suffering from severe mental disorders such as psychosis has raised much attention over the last decades. Previous works showed very high rates of traumatic experiences such as sexual abuse and experience of violence among patients suffering from psychoses [3, 4]. In addition, there is a growing number of research works focusing on the relationship between trauma, psychosis and PTSD, with some authors suggesting that psychosis could be a way of reacting to traumatic experiences [5–7]. Moreover, the role of experiences made in psychiatric inpatient care, including involuntary admissions and coercive measures such as restraint or seclusion, has been examined, and studies suggest a potentially negative influence of coercive measures and other experiences in inpatient setting on the development or exacerbation of PTSD symptoms or underline traumatic experiences as a potential risk factor for experiencing coercive measures [8–11]. Findings suggest that a particular group of patients suffering from severe mental illness and having experienced traumatic events in the past could be particularly vulnerable to interventions that might precipitate or exacerbate symptoms of PTSD. Paksarian et al. also showed that women were more likely to report having experienced traumatic events during past hospital stays, a finding in line with other works showing that women were more likely to report harmful experiences in psychiatric settings and negative impact of coercion [10, 12]. Hence, interventions are needed that not only aim at reducing the use of coercion but also address trauma-related issues.

Among strategies implemented to reduce the use of coercive measures in inpatient care, post-coercion review sessions have received growing attention. Through a joint analysis and reflection of the situation that led to the coercive measure, goals of post-coercion review are: to allow patients and staff members to view the event from the others' perspective, to repair ruptures of the therapeutic alliance and to reinforce working relationships, provide emotional expression and relief regarding the experienced situation and coercive measure, and to prevent the use of further coercive interventions [13, 14]. Post-coercion review sessions have been evaluated as an important intervention in the context of coercion by patients and professionals [15]. Precise guidelines or recommendations on the content or performance of post-coercion reviews have not been published, and they are rarely performed in clinical practice according to Needham and Sands [16]. To date, one other controlled study investigating the effects of post-coercion review did not show a significant reduction of PTSD symptoms [17]. Based on the previous clinical experiences made within the context of a recovery orientation of inpatient care (Weddinger Model), a standardized guideline for the conduction of a post-coercion reflecting review session was developed [13, 18]. A first observational study indicated a good acceptance of the intervention by patients and staff members [13, 14].

Aims of the study

The main goal of this work was to determine the impact of standardized post-coercion review sessions on the experience of peritraumatic distress and posttraumatic symptoms in patients with psychotic disorders who underwent coercive measures in an inpatient setting using a randomized controlled trial design. It was hypothesized that the provision of a single, standardized, post-coercion review session, compared to standard care without such a structured intervention, would reduce peritraumatic distress as well as the prevalence of PTSD symptoms at the time of discharge from hospital.

Materials and methods

Design

The present study is part of a larger RCT primarily conducted to investigate the effects of post-coercion review sessions on coercion-related outcomes (ClinicalTrials.gov-ID NCT03512925) financed by the German Ministry of Health. This sub-study examined the effect of a standardized post-coercion reflecting review session on the perception of coercive measures as potentially traumatizing and on the prevalence of PTSD symptoms at discharge following experienced coercion. The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving patients were approved by the ethics committee of the Charité Universitätsmedizin Berlin (ID: EA1/158/17). The data that support the findings of this study are available from the corresponding author upon reasonable request.

Participants

Patients admitted to acute psychiatric wards in 6 psychiatric clinics in Berlin were recruited between November 2017 and May 2019. We included patients with diagnoses of psychotic disorders (ICD-10 codes: F1×.5, F2×, F30.2, F31.2), aged between 18 and 65 years, who had experienced at least one coercive intervention during their current hospitalization. Participants had to be able to consent to their participation at the time of the assessment interview. Patients who were discharged within 24 h after admission were not included. Comorbid severe organic brain disorders, severe cognitive deficits and insufficient German language skills were

exclusion criteria.Written informed consent was obtained from all participants.

Definition of coercive interventions

The following coercive interventions were considered in the study: mechanical restraint, seclusion and forced medication based on court order.

Participating clinics

All public psychiatric hospitals in Berlin were contacted to achieve study participation through their heads of department. Six centers which, respectively, provide psychiatric care for a defined catchment area responded positively. As all centers work under the same legislation and in the same county, homogeneity of standards and policies can broadly be assumed. The patient recruitment took place on the acute wards of the participating centers, where the vast majority of patient with severe mental illness are treated and coercive measures are predominantly executed.

Contact persons responsible for the recruitment were appointed on each participating ward. These contact persons ensured the planning and performance of the intervention.

Recruitment, randomization and course of study

The contact persons on each ward were reached via telephone on every weekday to identify patients meeting the inclusion criteria. Data regarding age, sex, the type of coercive measure experienced, and the diagnoses were extracted. Since the planned intervention did not decisively differ from the usual routine of care and most potential study participants were unable to consent to study participation at the time of the first coercive intervention, we decided to conduct a randomization procedure suggested by Zelen to avoid recruitment bias [19, 20]. We used block randomization with periods of 8 for each ward. Randomization blocks were generated by the main research investigator using an online randomization tool. Patients were allocated to either the intervention or the control group immediately after they experienced the first coercive intervention during their hospital stay. The randomization result was communicated to the contact person on each ward and, thus, unmasked to staff members, research workers and patients. As the assessment interviews were centered on the effects of the post-coercion review session on the experience of coercion, research personnel were unblinded with regard to the randomization status. The sample size regarding the primary outcomes of perceived coercion studied in our RCT was calculated on the basis of an expected medium effect size (Cohen's f 0.25), an expected power = 0.80 and planned factorial ANCOVA with two factors and a covariate. A sample size of $n = 128$ was calculated.

The daily telephone contacts also served as an opportunity to establish whether the reflecting review sessions (intervention group) were conducted and to organize the assessment interview that took place at discharge from the ward and was completed by trained research assistants of the main research team. Therefore, they were not involved in patients' treatments. At that time, patients were asked to give their written informed consent to participate.

The contact persons on the wards informed the research team about execution and date of the reflecting review sessions. Participants were asked during the assessment if they had received the scheduled intervention and were invited to give brief descriptions. Patients who had been randomized to the control condition were equally questioned whether they had a post-coercion conversation with a team member.

Description of study intervention: reflecting review session

Participants randomized to the intervention group were offered the opportunity to participate in a standardized, post-coercion reflecting review session during their hospital stay. This interview was conducted by staff members who underwent a previous training course. Intervention guideline, frame and setting described by Wullschleger et al. served as the basis of this structured intervention [14]. Besides the patient, a staff member actively involved in the decision to use coercion participates to the session and patients are encouraged to invite any person of trust or another member of staff or peer-worker to participate. The session is moderated by a member of staff not directly involved in the coercive situation. The moderator conducts the interview, hereby guaranteeing the structure and completion of the interview, as well as inviting the patient to express his or her perception and feelings about the coercive measure and the precipitating situation. Participants are first asked to describe their perception of the escalating crisis situation which lead to the eventual use of coercion and the coercive measure itself. Therefore, a process of sharing of patients' and staff members' perspectives is initiated. Then, the moderator asks open-ended questions addressing following issues: alternatives to coercion, personal wishes during and after the coercive intervention, intelligibility of the reasons for the use of coercion. At the end of the interview, the patient is offered the opportunity to include the conclusions of the interview in a joint crisis plan or an advance directive.

The interview was repeatedly offered to the patient until his/her discharge from the ward, as the pilot study had shown that patients themselves should determine the preferred point of time to discuss their experience of coercion.

Although initially designed as a "debriefing intervention" supposed to be performed promptly after the initial coercive intervention took place, the pilot evaluation had also pointed out that most patients were emotionally and clinically incapable to join this interview until a later point of their hospital treatment. For this reason, we decided to rename the intervention into "post-coercion reflecting review session" to underline its reflecting character and avoid confusion with other debriefing interventions.

Training and implementation

A training course providing the adequate application of the guideline was developed. It consisted of the presentation of the theoretical and scientific background of the intervention, the description of the guideline and a role play. This course was given to the treating multi-professional teams in the participating centers prior to the initiation of the study.

Description of the control intervention: standard treatment

Patients who were randomized to the control group underwent routine clinical treatment which might have encompassed conversations about experienced coercion and the therapeutic processing of their personal and emotional sequelae. However, these interventions were administered in an unstructured manner based on clinical necessities lacking a standardized frame and setting.

Measures

Socio-demographic and anamnestic data

Information on age, sex, socio-economic status and history of migration were collected during the assessment interview. Clinical data regarding previous hospitalizations, present and past pharmacological treatment, substance abuse, former experiences of coercion and debriefing interventions were captured.

Clinical data

The treating clinicians were asked to complete the Global Assessment of Functioning scale (GAF) and the Clinical Global Impression Severity scale (CGI-S) for each participant regarding their mental state at the time of the first coercive intervention [21, 22]. To simplify the assessment of symptoms and reduce the proportion of missing data, clinicians rated the severity of the following symptom categories on individual 4-point Likert scales (absent, mild, moderate, severe): positive symptoms, negative symptoms, global symptomatology, mania, depression and lack of insight.

Objective use of coercion

Data on type and number of coercive interventions experienced by the study participants during the index hospitalization were collected by reviewing patients' records.

Perception of coercive measures as distressing and potentially traumatizing

We used the German version of the Peritraumatic Distress Inventory (PDI), which was developed to assess the PTSD diagnostic criterion A2 of the DSM-IV TR [23]. The PDI measures the level of emotional distress and physiological reactions experienced during or immediately after a traumatic event. It comprises 13 items rated on 5-point likert scales and a total score is composed by adding the scores obtained for each item. Higher values indicate a higher intensity of the peritraumatic reaction and thus a higher risk to develop PTSD. A cut-off score of 14 has been proposed to identify patients at risk, thus needing further assessment (sensitivity 84% and specificity 47%) [24].

PTSD symptoms

Symptoms of PTSD were assessed with the help of the German version of the Impact of Events Scale-Revised (IES-R) [25]. The IES-R is an instrument designed to assess the presence of symptoms of PTSD. Patients rate each of the 22 items on a 4-point Likert scale according to the frequency of presented symptoms. Three subscales are formed: (1) intrusion, (2) avoidance and (3) hyperarousal. Higher values on each subscale indicate a higher level of symptom load. According to Maercker et al., the presence of PTSD can be assessed as follows using the three IES-R subscale scores: $X = (-0.02 \times \text{Intrusion}) + (0.07 \times \text{avoidance}) + (0.15 \times \text{hyperarousal}) - 4.36$. If $X > 0$, a PTSD should be suspected [26]

Statistics

Socio-demographic and clinical characteristics of the studied samples were compared using *t* test and chi-square tests.

An intention-to-treat analysis was performed based on the randomization results, regardless of violations of the study protocol. In an exploratory analysis, we investigated the possible influence of the kind of experienced coercive measure on the results, as some evidence indicates that seclusion might be better accepted than restraint, although data regarding this aspect refer to indicators of subjective perceived coercion or patients' preferences and no evidence clearly points at differences between seclusion and restraint as to potential adverse effects including the development of PTSD [27]. No significant differences were found regarding the tested outcomes and so the variable was not included in

the main analysis. Similarly, differences between participating clinics were investigated without significant results.

A univariate ANOVA was performed to assess the main effects of the independent factors post-coercion reflecting review session and gender as well as their interaction effect on the peritraumatic reaction elicited by the index coercive measure. A factorial MANCOVA and post hoc univariate ANCOVAs were used to investigate the main effects of the independent factors post-coercion reflecting review session and gender as well as their interaction effect on post-traumatic symptoms as measured by the 3 subscales of the IES-R as dependent variables. To control for the effect of the perception of the coercive measure as traumatic the mean PDI score was used as a covariate. A Chi-square test was conducted to compare the risk of developing a PTSD based on the proposed cut-off score for the PDI [24]. A Chi-square test was also executed to assess differences of the clinical probability of having a PTSD based on the IES score proposed by a formula of the German translators [26].

Statistical significance was defined at a two-sided $p < 0.05$. IBM SPSS Statistics 25 was utilized for statistical calculations.

Results

Sample description

A total number of 422 patients were randomized after having experienced a coercive intervention on one of the participating wards. 211 patients were initially allocated to the intervention and 211 to the control group. In each group, 98 patients were discharged unexpectedly before being contacted by the research team. Among those contacted, 35 patients in the intervention group and 40 in the control arm refused participation. Respectively, 26 and 16 patients in the intervention and control group were excluded because of persisting cognitive deficits, language barrier or adjustment of their main diagnosis. Finally, 109 patients consented to participate—52 participants in the intervention group and 57 in the control group. 100 patients (intervention group $n = 45$; control group $n = 55$) answered the PDI and 83 the IES-R (intervention group $n = 36$; control group $n = 47$). A total of 82 participants answered both the PDI and the IES-R (intervention group $n = 36$; control group $n = 46$) and, thus, constituted the final sample for intention-to-treat analysis.

Among them, 32 participants in the intervention group received a post-coercion reflecting review session as planned. In the control group, 24 patients reported not receiving any kind of post-coercion review. The randomization chart is shown in Fig. 1.

The socio-demographic and clinical characteristics of the included participants are summarized in Table 1. No statistical differences were found between the samples regarding socio-demographic or clinical data.

On average, the post-coercion reflecting review session took place at a median of 34.5 days after the initial coercive measure.

Patients who refused to participate were slightly older (44.23 vs. 38.83 years.) than participating patients and the female proportion was marginally larger (52% vs. 49.54%). Regarding the patients in the intervention arm who refused to participate, 16 received a post-coercion reflecting review session, 9 refused it and 10 patients did not receive the intervention for other reasons (time limitation, intervention not provided by the team).

Peritraumatic reaction

Mean PDI values are summarized in Table 2.

The mean PDI score of patients in the intervention group was 22.03 (SD = 11.67) and 23.65 (SD = 15.36) in the control group. The performed ANOVA showed no significant main effect of the intervention or gender and no significant interaction effect of intervention and gender. Results are shown in Tables 2 and 3.

Using the cut-off score of 14, the analysis showed that 30 patients in the control group (65.2%) and 27 patients (75.0%) in the intervention group exhibited a peritraumatic reaction requiring further clinical assessment regarding the risk of developing a PTSD. Difference across groups was not statistically significant, $X^2(1) = 0.912$, $p = 0.340$.

Symptoms of PTSD

Mean values of all three IES-R subscales are summarized in Table 2.

The performed multivariate analysis (MANCOVA) across all three IES-R subscales with intervention and gender as independent factors and the mean PDI score as covariate showed a significant effect of the intervention at the multivariate level, Pillai's trace = 0.109, $F(3,75) = 3.054$, $p = 0.034$, partial $\eta^2 = 0.109$. The covariate (mean PDI score) proved to be significantly correlated with the analyzed dependent variables at the multivariate level, Pillai's trace = 0.489, $F(3,75) = 23.901$, $p < 0.001$, partial $\eta^2 = 0.489$. Neither gender nor the interaction between intervention and gender showed statistically significant effects at the multivariate level [gender: Pillai's trace = 0.034, $F(3,75) = 0.887$, $p = 0.452$; intervention × gender: Pillai's trace = 0.016, $F(3,75) = 0.415$, $p = 0.743$].

Subsequent univariate ANCOVAs using the different IES-R subscales as dependent variables, intervention and gender as independent variables and mean PDI score as a covariate were performed. Results are summarized in Table 3. There was a statistically significant main effect

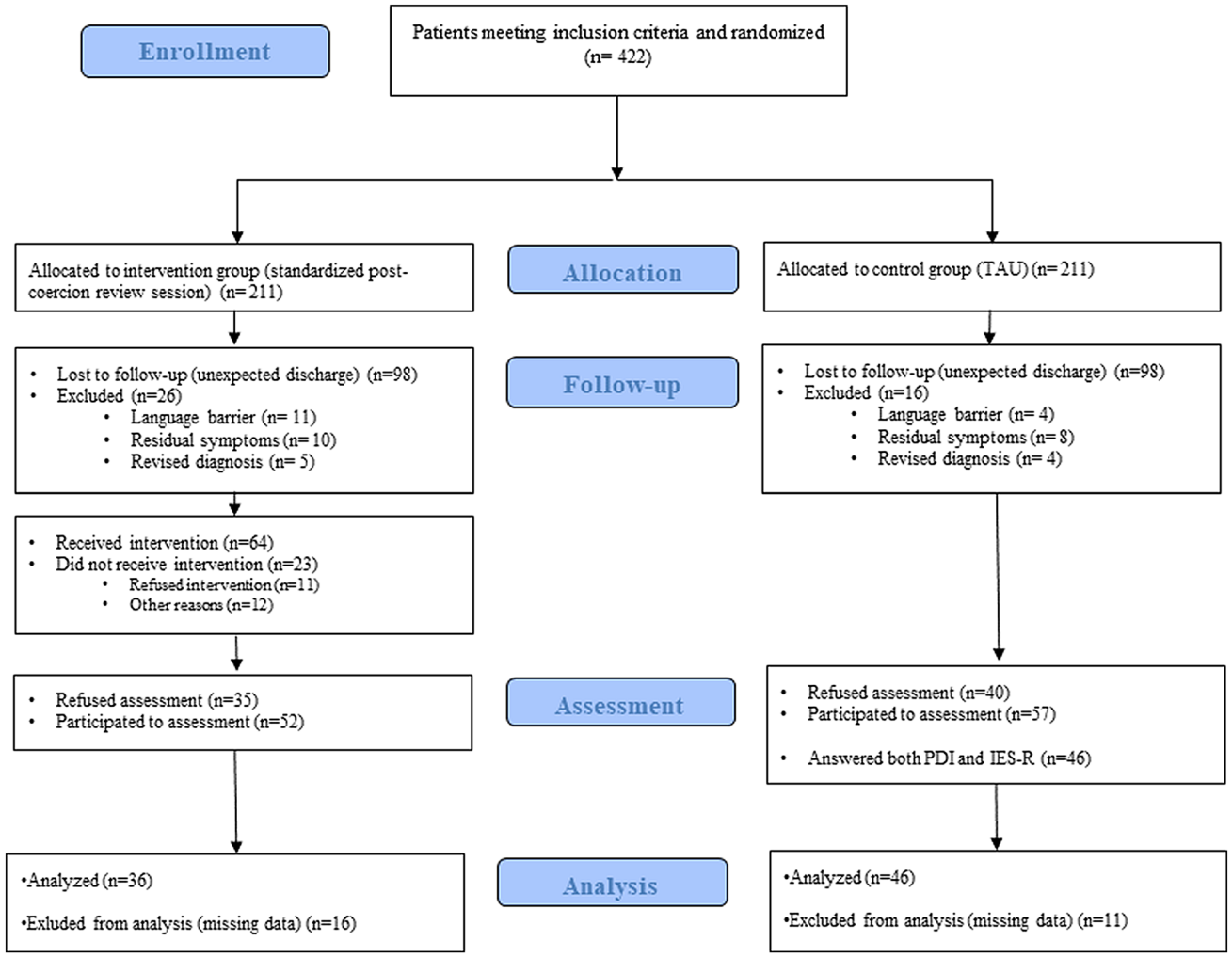

Fig. 1 Study flowchart (adapted from the CONSORT diagram)

of the intervention for the subscales intrusion and hyperarousal, with participants in the intervention group showing lower mean scores on these subscales. No main effect of the intervention was found regarding the avoidance subscale. Furthermore, no main effect of gender or of the interaction between the two independent variables was found. The effect of the covariate was shown to be statistically significant across all three subscales, with higher mean PDI scores being associated with higher scores on the IES-R subscales.

Clinical probability of PTSD

When analyzing the clinical probability of PTSD across the studied sample using the formula proposed by Maercker et al., results highlight that 13 patients (28.3%) in the control group and 4 (11.1%) in the intervention group showed a high diagnostic probability of having a PTSD [26]. This difference, however, was not statistically significant, X^2 (1) = 3.614, $p = 0.057$.

Discussion

The results of this RCT suggest for the first time a beneficial effect of post-coercion review sessions on the development of certain symptoms that might be indicators of the development of PTSD after coercive interventions in patients with psychotic disorders. The performed analysis indicated that patients who underwent a standardized post-coercion review showed significantly lower levels of intrusion and hyperarousal symptoms as measured by the IES-R. Accordingly, a lower proportion of probable PTSD was found among patients who received the intervention compared to the control group. This difference was, however, only marginally significant, which is most probably linked to the fact that avoidance symptoms were not affected by the intervention and to a lack of statistical power. These findings, thus, highlight that post-coercion reviews might be a means of counteracting the negative

Table 1 Socio-demographic and clinical characteristics of the studied samples

	Control $n=46$	Intervention $n=36$	Total $n=82$
Age (years) M (SD)	38.89 (10.98)	39.14 (14.87)	39.00 (12.75)
Gender *n* (%)			
Female	21 (45.7%)	22 (61.1%)	43 (52.4%)
Male	25 (54.3%)	14 (38.9%)	39 (47.6%)
Hist. of migration *n* (%)	$n=45$	$n=35$	$n=80$
Yes	7 (15.6%)	12 (34.3%)	19 (23.7%)
No	38 (84.4%)	23 (65.7%)	61 (76.3%)
Incap. benefits *n* (%)	$n=45$	$n=33$	$n=78$
Yes	15 (33.3%)	10 (30.3%)	25 (32.1%)
No	30 (66.7%)	23 (69.7%)	53 (67.9%)
Level of education *n* (%)	$n=45$	$n=31$	$n=76$
No degree	3 (6.7%)	1 (3.2%)	4 (5.3%)
Lower sec. education	7 (15.6%)	4 (12.9%)	11 (14.5%)
Higher sec. education	13 (28.9%)	9 (29.0%)	22 (28.9%)
High school graduation	8 (17.8%)	5 (16.1%)	13 (17.1%)
Vocational college	7 (15.6%)	6 (19.4%)	13 (17.1%)
University	7 (15.6%)	6 (19.4%)	13 (17.1%)
Diagnosis *n* (%)			
F19.×5, F30.2, F31.2	8 (17.4%)	10 (27.8%)	18 (22.0%)
F2.×	38 (82.6%)	26 (72.2%)	64 (78.0%)
Clinical parameters	$n=39$	$n=33$	$n=72$
GAF M (SD)	29.15 (12.40)	26.58 (14.54)	27.97 (13.39)
CGI-S M (SD)	5.59 (.72)	5.73 (.63)	5.65 (.67)
Symptom severity M (SD)			
Positive sympt.	2.41 (.79)	2.12 (1.02)	2.28 (.91)
Negative sympt.	1.26 (.91)	1.18 (0.85)	1.22 (.88)
Global sympt.	2.41 (.68)	2.36 (.70)	2.39 (.68)
Mania	1.36 (1.11)	1.24 (1.30)	1.31 (1.19)
Depression	.54 (.85)	0.42 (.66)	0.49 (.77)
Lack of insight	2.41 (.82)	2.27 (.91)	2.35 (.86)
Past coercion *n* (%)	$n=45$	$n=36$	$n=71$
Yes	31 (68.9%)	26 (72.2%)	57 (70.4%)
No	14 (31.1%)	10 (27.8%)	24 (29.6%)
Previous post-coercion review *n* (%)	$n=31$	$n=27$	$n=58$
Yes	3 (9.7%)	4 (14.8%)	7 (12.1%)
No	28 (90.3%)	23 (85.2%)	51 (87.9%)
Index coercive intervention *n* (%)			
Restraint	29 (63.0%)	23 (63.9%)	52 (63.4%)
Seclusion	12 (26.1%)	12 (33.3%)	24 (29.3%)
Forced med. on court order	5 (10.9%)	1 (2.8%)	6 (7.3%)
Coercive interventions during stay			
Restraint			
Patients *n* (%)	32 (69.6%)	24 (66.7%)	56 (68.3%)
Events M (SD)	1.53 (.95)	2.28 (3.21)	1.90 (2.24)
Seclusion			
Patients *n* (%)	31 (67.4%)	25 (69.4%)	56 (68.3%)
Events M (SD)	1.81 (1.42)	2.40 (3.12)	2.07 (2.33)
Forced med. on court order			
Patients (%)	3 (6.5%)	4 (11.1%)	7 (8.5%)

M mean, *SD* standard deviation, *GAF* global assessment of functioning, *CGI-S* clinical global impression-severity scale

Table 2 Mean values of the PDI and the IES-R subscales across the study groups

	Control ($n=46$)	Intervention ($n=36$)	Total ($n=82$)
PDI			
Mean	23.65	22.03	22.94
SD	15.36	11.67	13.81
IES-R			
Intrusion			
Mean	13.48	7.97	11.06
SD	11.42	8.55	10.56
Hyperarousal			
Mean	13.11	8.92	11.27
SD	10.20	7.55	9.32
Avoidance			
Mean	17.35	17.50	17.41
SD	12.78	11.39	12.11

PDI Peritraumatic Distress Inventory, *IES-R* Impact of Events Scale-Revised, *SD* standard deviation

effect of coercive measures on these symptoms known to be invalidating and pervasive in some patients.

This result is not in keeping with the single previous study on this issue [17]. However, the study of Whitecross et al. examined patients with psychoses as well as other psychiatric disorders regarding their experience of seclusion. The study design was controlled, but not randomized, and intervention and control conditions were implemented on different wards. Even though a similarly high proportion of patients met the criteria for 'probable PTSD' on the IES-R, post-seclusion counseling did not reduce the trauma experiences significantly compared to control patients who were not offered this intervention. Differences to our findings might not only be explained by a larger sample size and a more rigorous design in the present study, but also by examination of different coercive measures (seclusion, restraint, forced medication). It can be assumed that mechanical restraint and forced medication bear a higher traumatic impact compared to seclusion, which may render a respective intervention more effective. Moreover, the post-coercion review in our trial was delivered much later in the course of the inpatient treatment (43 days after the initial coercive measure versus 3–7 days post-seclusion in Whitecross et al.). The nurses' interventions of Whitecross et al. were based on five essential areas of debriefing (counseling; ventilation; support and reassurance; screening for physical adverse effects; psychoeducation), while setting and content of the multi-professional review session reported here are considerably different, putting the focus on mutual perspective taking and repair of a ruptured working relationship with the team in presence of a moderator ensuring proper conduction of the interview.

Therefore, it can be discussed that the effect of the present intervention relates to its particular setting and its psychotherapeutic character. The close involvement of patients and the encouraged dialog with the staff members facilitates differentiation of emotions and exchange of subjective perceptions of the coercive situation. The given opportunity to repair the potentially damaged therapeutic relationship and to restore trust and respect being essential for self-worth and -efficacy (post coercion review denotes the option of joint crisis plans) in spite of the coercive intervention might be additional factors contributing to the reduction of PTSD symptoms.

Beyond these results, this study confirmed the highly traumatic potential of coercive measures. Overall, about 70% of the included patients presented distinct peritraumatic reactions rendering them at risk of developing a PTSD. Accordingly, about 20% of the participants showed a high clinical probability of PTSD. These results are in line with previous works investigating the deleterious effect of coercive measures and traumatic experiences made within psychiatric settings [8, 9]. They, thus, underline the necessity of a thorough assessment of trauma-related symptoms, particularly in conjunction with coercion. The negative and potentially traumatic experiences made during inpatient therapy might have serious consequences on clinical course, engagement into treatment and recovery perspectives. Moreover, the high prevalence of traumatic experiences during hospital treatment is not compatible with a human rights' perspective in psychiatric care [28]. Reducing coercive interventions in psychiatry must, therefore, be considered an ethical and clinical imperative.

Limitations

A number of limitations might have influenced our results. The study design did not encompass the assessment of previous traumatic experiences that might have been made outside of the psychiatric context, during previous inpatient hospitalizations or through the experience of psychotic states. The possible association between these previous experiences and the severity of the reaction to coercive interventions should be studied in further works. The retrospective assessment of the peritraumatic reaction and PTSD symptoms weeks after the coercive intervention took place could also be considered as potential bias, as events that followed the coercive measure and that took place during the hospital stay might have influenced responses. However, the findings of the present study regarding the prevalence of PTSD are in line with previous works and it can, thus, be assumed that this bias did not significantly affect the results [29].

Another limitation refers to the inclusion rate of patients which did not allow the research team to meet the expected inclusion goals during the planed recruitment period and,

Table 3 Univariate ANOVA and ANCOVA results for the PDI and the IES-R subscales

	SS	*df*	MS	*F*	*P*	Part. η^2
PDI						
Intervention	115.67	1	115.67	0.60	0.440	0.008
Gender	323.72	1	323.72	1.69	0.198	0.021
Intervention × gender	136.28	1	136.28	0.71	0.402	0.009
Error	14,981.16	78	192.07			
Total	58,591.00	82				
IES-R intrusion						
PDI	3589.56	1	3589.56	57.24	< 0.001*	0.426
Intervention	360.12	1	360.12	5.74	0.019*	0.069
Gender	66.95	1	66.95	1.07	0.305	0.014
Intervention × gender	55.53	1	55.53	0.89	0.350	0.011
Error	4829.12	77	62.72			
Total	19,067.00	82				
IES-R hyperarousal						
PDI	2835.87	1	2835.87	57.30	< 0.001*	0.427
Intervention	215.64	1	215.64	4.36	0.040*	0.054
Gender	2.69	1	2.69	0.05	0.816	0.001
Intervention × gender	37.65	1	37.65	0.761	0.386	0.010
Error	3810.12	77	49.48			
Total	17,454.00	82				
IES-R avoidance						
PDI	3313.16	1	3313.16	30.73	< 0.001*	0.285
Intervention	13.49	1	13.49	0.13	0.724	0.002
Gender	42.58	1	42.58	0.40	0.532	0.005
Intervention × gender	93.07	1	93.07	0.863	0.356	0.011
Error	8302.34	77	107.82			
Total	36,752.00	82				

Mean PDI score used as covariate

IES-R Impact of Events Scale-Revised, *PDI* Peritraumatic Distress Inventory, *SS* sum of squares, *df* degrees of freedom, *MS* mean square, *F* ANCOVA *F* statistic

*$p < 0.05$

thus, resulted in a loss of power. Unfortunately, a relevant number of patients were not reached by the research team prior to their prompt or unplanned discharges. Willingness to participate in this study may have been associated with younger age as a potential indicator of lower chronicity. As selection bias is not fully avoidable in this and similar investigations, the studied sample must not be considered entirely representative of the inpatient population experiencing coercive measures. Future evaluations of post-coercion review should ensure that briefly hospitalized patients are receiving the foreseen intervention. A stronger focus on staff training or a stable team of moderating staff members might be useful to achieve this goal. The assessment of long-term effects of post-coercion review on PTSD symptoms and the development of manifest PTSD itself shall be focused on in future research.

In summary, the developed standardized post-coercion review can be seen as an intervention that might contribute to the reduction of the burden of PTSD symptoms in severely ill patients subjected to coercive interventions. It can be implemented without greater effort and serves as an important tool to strengthen trauma-informed care in inpatient settings.

Author contributions AW, CM, LM, AV, FB and AH contributed to the study conception and design. Material preparation, data collection and analysis were performed by AW, AV, JM and LR. The first draft of the manuscript was written by AW and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

Funding Open access funding provided by University of Geneva. The trial was funded by the German Federal Ministry of Health.

Data availability Data are available through the corresponding author upon reasonable request.

Compliance with ethical standards

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

Ethics approval All procedures performed in studies involving human participants were in accordance with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was approved by the ethics committee of the Charité Universitätsmedizin Berlin (ID: EA1/158/17).

Consent to participate Written consent was obtained from all participants before the performed assessment.

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European Psychiatry

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Effect of standardized post-coercion review on subjective coercion: Results of a randomized-controlled trial

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Research Article

Cite this article: Wullschleger A, Vandamme A, Mielau J, Stoll L, Heinz A, Bermpohl F, Bechdolf A, Stelzig M, Hardt O, Hauth I, Holthoff-Detto V, Mahler L, Montag C (2021). Effect of standardized post-coercion review on subjective coercion: Results of a randomized-controlled trial. *European Psychiatry*, **64**(1), e78, 1–10
https://doi.org/10.1192/j.eurpsy.2021.2256

Received: 14 June 2021
Revised: 07 October 2021
Accepted: 31 October 2021

Keywords:
Coercion; post-coercion review; psychiatry; subjective coercion

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Abstract

Background. Post-coercion review has been increasingly regarded as a useful intervention in psychiatric inpatient setting. However, little is known about its effect on perceived coercion.
Methods. A multicenter, two-armed, randomized controlled trial was conducted, aiming at analyzing the effect of post-coercion review on perceived coercion. People with severe mental disorders, who experienced at least one coercive measure during inpatient treatment, were randomized using Zelen's design to an intervention group receiving standardized post-coercion review, or a control group treated as usual. The MacArthur admission experience scale (AES) and the coercion ladder (CL) were used to assess perceived coercion during inpatient treatment. The coercion experience scale (CES) measured experienced coercion during the coercive intervention. Analyses of covariance were performed to determine group differences.
Results. Of 422 randomized participants, $n = 109$ consented to participate in the trial. A restricted intention-to-treat analysis of all individuals who consented revealed no significant effect of the intervention on perceived coercion. A significant interaction effect between the factors gender and intervention on the AES scores was found. Sensitivity analysis revealed significant effects of the intervention on both AES and CL scores and an interaction effect between intervention and gender, indicating a higher efficacy in women. No effect of the intervention on CES scores was found.
Conclusions. Standardized post-coercion review sessions did not alleviate the subjective perception of coercion in the total sample. However, post hoc analysis revealed a significant effect of the intervention in women. Results indicate the need to further address gender-specific issues related to coercion.

Introduction

The use of coercive interventions such as seclusion and mechanical restraint in psychiatric settings and their consequences have been intensively debated during the last decades, especially since the adoption of the UN Convention on the Rights of People with Disabilities came into force [1]. In this context, subjectively perceived coercion has been investigated as important outcome. Associated with poor clinical outcomes, a negative impact on outpatient treatment [2,3] as well as with low satisfaction and negative attitudes toward hospital treatment [4]. Perception of fairness during the treatment process and participation in decision-making seem to mitigate the subjective perception of coercion [5–8]. Previous works suggested that women might be more prone to experience higher levels of perceived coercion than men [9,10], and that younger patients might experience higher levels of subjective coercion than older patients [11,12].

Among interventions aiming to reduce the use of coercive measures, post-coercion review has received growing attention. Post-coercion review sessions have been integrated into guidelines addressing the management of coercion [13]. However, such interventions are to date not sufficiently implemented [14]. Moreover, a clear definition of a post-coercion review or standards regarding their setting and content do not exist [14,15]. Interventions targeting both service users

and staff members are needed to ensure a reflexive process and the provision of space to address emotional issues raised by coercion [14].

Only few studies have investigated the direct effect of post-coercion review sessions on subjective perception of coercion. The vast majority of these works is based upon qualitative data underlying the subjective benefits of such interventions and clarify the central role of emotional support aspects of post-coercion review [16,17].

Based on the theoretical background and the practical experiences made with a new recovery-oriented model of care, the "*Weddinger Modell*" [18], a guideline for a structured, post-coercion review session was developed by a multiprofessional working group. This guideline was evaluated in a pilot study showing that it was considered as a helpful tool and appraised by service users and staff members [19].

The present multicenter randomized-controlled trial aimed at evaluating the effects of standardized post-coercion review sessions on subjectively experienced coercion, also considering known influencing factors like gender and age. Participants were randomized to either receiving a standardized post-coercion review session or to standard care. It was hypothesized that the additional provision of the intervention would reduce the subjective experience of coercion throughout the hospital stay and regarding the index coercive intervention compared to standard care.

Methods

Design

The study was designed as a multicenter, two-armed, randomized controlled trial (ClinicalTrials.gov ID NCT03512925). The project was approved by the ethics committee of the Charité Universitätsmedizin Berlin (No. EA1/158/17). The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

Participating clinics

All public psychiatric hospitals in Berlin were contacted through their head of departments. Six clinics providing acute psychiatric care for a defined catchment area agreed to take part in the present study.

Participants

Participants were recruited on general psychiatric wards that routinely perform coercive measures. We included participants aged between 18 and 65, diagnosed with psychotic disorder (ICD-10: F1x.5, F2x, F30.2, and F31.2), who experienced at least one coercive measure (mechanical restraint, seclusion, and coerced medication on court order) during their hospital stay. People discharged within 24 h after admission, presenting severe cognitive deficits or limited knowledge in German were excluded from participation.

Recruitment, randomization, and study procedure

Designated contact staff members on each ward were contacted by telephone daily to identify people who met inclusion criteria. Since the intervention only slightly differed from usual standards of care and since many potential participants were unable to consent to participation at the time of the first coercive measure, a randomization procedure as described by Zelen was used to avoid recruitment bias [20,21]. Following this method, potential participants meeting inclusion criteria were randomized after the first coercive measure to either the intervention or the control group. A block randomization with periods of eight on each ward was used, allocation status was concealed using sealed envelopes. The allocation was communicated to the ward's contact person by telephone. Staff members, research team and participants were thus unblinded. For each randomized person, information about age, gender, type of coercive measure, and diagnosis were provided by the contact person to the research team. Potential participants were contacted and informed about the study by the research team in the course of their inpatient stay, when capacity to consent was restored. The assessment took place shortly before discharge, after receiving written informed consent.

Regarding the adherence to protocol, information regarding the reflecting review sessions that took place were communicated to the research team by the wards' contact staff members. Daily contacts ensured the monitoring of the foreseen intervention and the planning of the study assessment. Additionally, we asked participants if they had received a post-coercion review session. Similarly, participants of the control group were asked whether some kind of post-coercion conversation had been initiated.

Intervention: Standardized post-coercion review session

Participants allocated to the intervention group were offered with a standardized post-coercion review session conducted by trained staff members of the ward [19]. The session was repeatedly offered until discharge, as it was shown that the preferred moment to participate varies between individuals and should be freely determined by them. Although initially designed to be performed promptly after the first occurrence of coercion, results of our pilot study indicated that most patients were initially emotionally and clinically unable to participate in the interview. Information regarding the conducted post-coercion review is summarized in Table 1.

Participating teams underwent a training session before study begin to ensure the correct application of the developed guideline. Training included information about the scientific background and the conduction of the intervention as well as role plays.

Control intervention: Standard treatment

Participants allocated to the control group received usual treatment which sometimes comprised conversations about experienced coercive measures. However, none of these conversations in routine treatment followed determined standards.

Measures

Sociodemographic and illness characteristics

Data regarding age, gender, socioeconomic status and migration status were collected during the assessment interview. Information about previous experiences of coercion and post-coercion reviews were collected as well.

Clinical data

Psychiatrists in charge of the participants completed the Global Assessment of Functioning scale (GAF) [22] and the Clinical Global Impression Severity scale (CGI-S) [23] for each participant regarding the time of the first coercive measure. To simplify symptoms assessment and reduce the amount of missing data,

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Table 1. Description of the post-coercion review session.

• *Participants*: patient, staff member actively involved in the decision to use coercion, moderating staff member not directly involved in the coercive situation. Patients are encouraged to invite any person of trust or another member of staff or peer workers to participate. The moderator conducts the interview warranting the structure and completion of the interview, as well as inviting the patient to express his or her perception and feelings about the coercive measure and the situation that led to the coercive measure
• *Duration*: approximately 30–40 min
• *Procedure*:
1. Participants are asked to describe their perception of the crisis situation which lead to the eventual use of coercion and the coercive measure itself. Therefore, a process of sharing of patients' and staff members' perspectives is initiated
2. The moderator asks open-ended questions to address following issues: alternatives to coercion, personal wishes during and after the coercive intervention, intelligibility of the reasons for the use of coercion. During this phase, the moderator facilitates the dialogue between all participants
3. The conditions of an optimal pursuit of care are addressed
4. At the end of the interview, the patient is offered the opportunity to include the conclusions of the interview in a joint crisis plan or an advance directive
• The review session does not target an agreement on the necessity and justification of the coercive measure. It aims at giving all participants the opportunity to express their subjective experience, reflect on the past events and consider the different perspectives involved. Thus, the interview should contribute to reinforcing or repairing the therapeutic relationship and allow for an improved mutual understanding and respect

psychiatrists rated the severity of the following symptoms clusters on four-point Likert scales (absent, mild, moderate, and severe): positive symptoms, negative symptoms, global symptomatology, mania, depression, and lack of insight.

Objective use of coercion

Information about the type and number of coercive measures experienced by the participants during the index hospital stay was retrieved from the participants' medical records.

Subjective coercion throughout the hospital stay

The global level of perceived coercion throughout the hospital stay was assessed using the German versions of the adapted MacArthur admission experience scale (AES) and the coercion ladder (CL).

The AES, originally designed to evaluate the level of perceived coercion linked to the admission process, was translated into German and adapted to analyze the perception of perceived coercion throughout the hospital stay. The AES comprises 23 items rated on a one- to five-point scale [24]. The first 15 items are allocated to three subscales: "perceived coercion" (five items), "negative pressures" (six items), and "process exclusion" (four items). The added scores of these three subscales form the AES-2 score. The last eight items build the subscales "treatment effectiveness" (four items) and "procedural justice" (four items) which are part of the AES-1 score. Higher AES-1 and AES-2 scores represent higher levels of perceived coercion or lower appraisal of received care, respectively [25].

The CL consists of a visual analogue scale ranging from 1 to 10, with higher values indicating higher levels of perceived coercion during hospital stay [26,27]. The CL was shown to parallel the results of the "perceived coercion" subscale (AES-PC) of the AES but seems to offer a more favorable administration and discrimination of higher levels of perceived coercion [4]. For the purpose of the present study, the introductory text of the CL was adapted in order to address the level of perceived coercion experienced during the whole inpatient stay.

Subjective coercion in relation to the experienced coercive intervention

The subjective perception of the burden occasioned by the specific coercive measure that was the subject of the post-coercion review was assessed using the coercion experience scale (CES) [28]. The CES is a self-rating instrument originally designed to compare the coerciveness of different coercive interventions. It features patients' viewpoints on restriction of personal autonomy, human rights and the degree of suffering during the coercive intervention, in addition to numerous associated stressors on a five-point Likert scale. Psychometric studies of the CES have proven satisfying reliability and validity [28,29]. The sum score was utilized for analyses described below.

Statistics

Using Zelen's design, an intention-to-treat analysis based on the randomization results had to be restricted to those participants who consented to take part in the study. This main sample ("as consented") was established and included participants regardless of study protocol violations. Sociodemographic and clinical characteristics were compared using Chi-square or Fisher's exact test for categorical variables and Mann–Whitney-test for ordinal variables.

We conducted MANCOVA to analyze the main effects of the independent factors randomization status (post-coercion reflecting review session yes/no) and gender as well as their interaction on the main dependent variables AES 1 and AES 2. Age was integrated in the analysis as a covariate. Post hoc univariate analyses of variance (ANOVA) were performed using Bonferroni correction. Box's test of equivalence of covariance matrices and Levene's test of equality of variances were not statistically significant.

We conducted a similar ANCOVA to analyze the differences of the CL scores between the two study groups, using the randomization status, gender, as well as their interaction, as independent factors, and age as a covariate.

As to CES scores, ANCOVA was performed, using randomization status, gender, and the nature of the index coercive measure, as well as the interactions between randomization status and gender and between randomization status and the index coercive measure, as independent factors and age as covariate. The nature of the index coercive measure was integrated in order to account for the original purpose of the CES. As the number of forced medication incidents was comparatively very small, we chose to exclude those cases from analysis, leaving only seclusion and restraint as categories.

To account for protocol violations, we performed a sensitivity analysis based on a per-protocol sample, including all participants who had received the intervention (post-coercion review session) or the control condition as intended by randomization.

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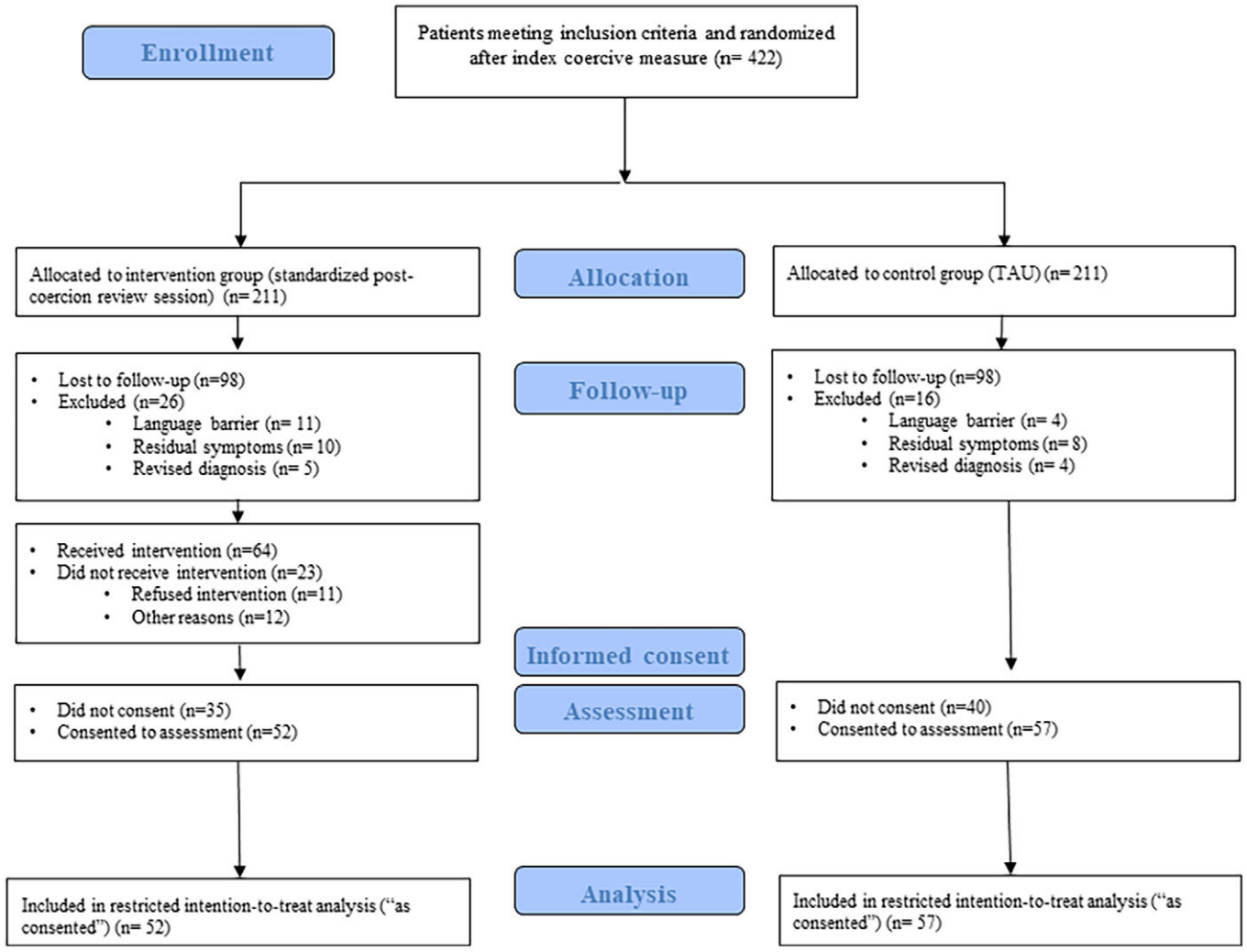

Figure 1. Study flowchart (adapted from the CONSORT diagram).

Statistical calculations were carried out using IBM SPPS Statistics 25. Statistical significance was defined at a two-sided $p < 0.05$.

Results

Sample description

Overall, 422 participants were randomized after initial experience of a coercive measure (intervention group = 211; control group = 211). The randomization chart is shown in Figure 1. In both groups, 98 participants could not be solicited to participate because of early, unplanned discharge, absconding, or communication issues with the participating wards.

A total of 109 persons consented to participate (inclusion rate: 25.8%). Thus, 52 participants in the intervention group and 57 in the control group were included in the intention-to-treat analysis.

Forty-eight participants received a post-coercion reflecting review session according to clinical documentation; however, among them, eight participants reported having received no intervention. In the control group, 44 participants received no post-coercion review and 13 participants were offered nonstandardized post-coercion review. Accordingly, 92 participants were included in the sample used for the per-protocol analysis (intervention group: 48, control group: 44).

The sociodemographic and clinical characteristics of the samples that entered the restricted intention-to-treat ("as consented") and the per-protocol analysis are summarized in Table 2. No significant group differences were found.

Time of intervention

Participants randomized to the intervention group received the foreseen review session at a median of 28.5 days after the initial coercive measure.

Parameters of subjective experienced coercion

All results are summarized in Tables 3 and 4.

MacArthur admission experience survey

Restricted intention-to-treat analysis ("as consented")

Using Pillai's trace, a significant interaction effect between intervention and gender was identified, $V = 0.067$, $F(2,95) = 3,416$,

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Table 2. Sociodemographic characteristics of the studied samples.

	Restr. intention-to-treat ("as consented") ($n = 109$)		Per-protocol ($n = 92$)	
	Control $n = 57$	Intervention $n = 52$	Control $n = 44$	Intervention $n = 48$
Age (yrs) *M (SD)*	39.11 (11.36)	38.54 (14.27)	38.66 (11.28)	39.02 (14.11)
Gender				
Female *n* (%)	26 (45.6%)	28 (53.8%)	20 (45.5%)	26 (54.2%)
Male *n* (%)	31 (54.4%)	24 (46.2%)	24 (54.5%)	22 (45.8%)
Hist. of migration *n* (%)	*n = 54*	*n = 49*	*n = 42*	*n = 45*
Yes *n* (%)	11 (20.4%)	17 (34.7%)	10 (23.8%)	14 (31.1%)
No *n* (%)	43 (79.6%)	32 (65.3%)	32 (76.2%)	31 (68.9%)
Incap. benefits *n* (%)	*n = 55*	*n = 44*	*n = 43*	*n = 40*
Yes	16 (29.1%)	12 (27.3%)	10 (23.3%)	11 (27.5%)
No	39 (70.9%)	32 (72.7%)	33 (76.7%)	29 (72.5%)
Level of education *n* (%)	*n = 55*	*n = 42*	*n = 43*	*n = 39*
No degree	4 (7.3%)	3 (7.1%)	3 (7.0%)	2 (5.1%)
Lower sec. education	9 (16.4%)	7 (16.7%)	6 (14.0%)	7 (17.9%)
Higher sec. education	15 (27.3%)	12 (28.6%)	14 (32.6%)	12 (30.8%)
High school graduation	11 (20.0%)	5 (11.9%)	9 (20.9%)	4 (10.3%)
Vocational college	7 (12.7%)	6 (14.3%)	4 (9.3%)	6 (15.4%)
University	9 (16.4%)	9 (21.4%)	7 (16.3%)	8 (20.5%)
Diagnosis *n* (%)				
F19.x5, F30.2, F31.2	10 (17.5%)	13 (25.0%)	7 (15.9%)	13 (27.1%)
F2.x	47 (82.5%)	39 (75.0%%)	37 (84.1%)	35 (72.9%)
Clinical parameters	*n = 53*	*n = 51*	*n = 41*	*n = 47*
GAF *M (SD)*	28.49 (12.42)	26.27 (13.28)	29.93 (12.73)	26.40 (13.67)
CGI-S *M (SD)*	5.53 (0.72)	5.80 (0.57)	5.49 (0.78)	5.79 (0.59)
Symptom severity M (±SD)				
Positive sympt.	2.43 (0.75)	2.27 (0.94)	2.34 (0.79)	2.28 (0.95)
Negative sympt.	1.21 (0.88)	1.18 (0.95)	1.17 (0.86)	1.17 (0.96)
Global sympt.	2.45 (0.64)	2.43 (0.70)	2.41 (0.67)	2.38 (0.71)
Mania	1.34 (1.13)	1.29 (1.24)	1.24 (1.14)	1.28 (1.25)
Depression	0.58 (0.86)	0.47 (0.67)	0.54 (0.78)	0.43 (0.65)
Lack of insight	2.30 (0.87)	2.29 (0.97)	2.17 (0.89)	2.28 (0.97)
Past coercion *n* (%)	*n = 56*	*n = 52*	*n = 43*	*n = 48*
Yes	37 (66.1%)	35 (67.3%)	28 (65.1%)	33 (68.8%)
No	19 (33.9%)	17 (32.7%)	15 (34.9%)	15 (31.3%)
Previous post-coercion review *n* (%)	*n* = 37	*n* = 36	*n* = 28	*n* = 34
Yes	3 (8.1%)	5 (13.9%)	0 (0.0%)	5 (14.7%)
No	34 (91.9%)	31 (86.1%)	28 (100.0%)	29 (85.3%)
Duration of index stay (days) *M (SD)*	54.69 (38.81)	70.10 (45.93)	52.95 (36.54)	69.56 (46.58)
Index coercive intervention *n* (%)				
Restraint	37 (64.9%)	31 (59.66%)	30 (68.2%)	27 (56.3%)
Seclusion	15 (26.3%)	18 (34.6%)	11 (25.0%)	18 (37.5%)
Forced med. on court order	5 (8.8%)	3 (5.8%)	3 (6.8%)	3 (66.3%)

Abbreviations: M, mean; SD, standard deviation.

https://doi.org/10.1192/j.eurpsy.2021.2256 Published online by Cambridge University Press

Table 3. Mean AES 1, AES 2, and CL.

	Restr. intention-to-treat ("as consented")								Per-protocol							
	Control group *M* (SD)				Intervention group *M* (SD)				Control group *M* (SD)				Intervention group *M* (SD)			
	AES 1	AES 2	CL	CES	AES 1	AES 2	CL	CES	AES 1	AES 2	CL	CES	AES 1	AES 2	CL	CES
m	4.70 (2.04)	8.60 (2.97)	5.57 (3.06)	93.94 (28.65)	5.70 (2.19)	9.05 (3.14)	6.22 (3.19)	97.58 (31.79)	5.02 (2.06)	9.22 (2.92)	6.04 (3.18)	90.83 (28.48)	5.95 (2.11)	9.29 (3.19)	6.00 (3.43)	97.00 (31.94)
f	5.91 (2.68)	10.44 (3.14)	6.80 (3.45)	102.51 (36.67)	4.61 (2.48)	8.35 (3.77)	5.39 (3.27)	94.05 (30.41)	6.50 (2.68)	11.12 (2.84)	7.89 (3.02)	109.09 (36.06)	4.18 (2.22)	8.06 (3.53)	4.88 (3.19)	71.40 (28.97)
Total	5.27 (2.42)	9.47 (3.16)	6.13 (3.27)	97.22 (31.85)	5.11 (2.39)	8.67 (3.49)	5.76 (3.23)	95.61 (30.70)	5.72 (2.46)	10.12 (3.00)	6.88 (3.21)	97.93 (32.42)	4.88 (2.32)	8.53 (3.42)	5.33 (3.29)	93.95 (31.58)

Note: Scores across study groups in the different study samples displayed by gender.
Abbreviations: AES, MacArthur admission experience survey; CES, coercion experience scale; CL, coercion ladder; M, mean; SD, standard deviation.

$p = 0.037$, partial $\eta^2 = 0.067$. There was no significant main effect of the post-coercion review session on the dependent variables AES-1 and AES-2, $V = 0.025$, $F(2,95) = 1,201$, $p = 0.305$, partial $\eta^2 = 0.025$. Similarly, no main effects of the independent variable gender or the covariate age were found.

Post hoc ANOVAs revealed a significant interaction effect between intervention and gender for both the AES-1 and AES-2. Simple effects analyses revealed that the intervention significantly reduced the perception of coercion in women (AES-1: $F(1,96) = 4,447$, $p = 0.038$, partial $\eta^2 = 0.044$; AES-2: $F(1,96) = 6,202$, $p = 0.014$, partial $\eta^2 = 0.061$) but not in men (AES-1: $F(1,96) = 2,370$, $p = 0.127$, partial $\eta^2 = 0.024$; AES-2: $F(1,96) = 0.278$, $p = 0.599$, partial $\eta^2 = 0.003$). No significant main effect of the intervention or gender was found. A significant main effect of the covariate age regarding AES-2 scores was found. Older age was associated with lower AES-2 scores.

Sensitivity analysis

As to the per-protocol analysis, multivariate analysis yielded a significant interaction effect between the intervention and gender, $V = 0.117$, $F(2,72) = 4,779$, $p = 0.011$, partial $\eta^2 = 0.117$. No significant main effect of the intervention or gender was evident when comparing both groups. However, a significant main effect of age ($V = 0.089$, $F(2,72) = 3,402$, $p = 0.039$, partial $\eta^2 = 0.086$) was identified.

At the univariate level, post hoc analysis showed a significant interaction effect between intervention and gender for both AES-1 and AES-2. Once again, simple effects analyses showed a significant influence of the intervention on both AES subscales in women (AES-1: $F(1,73) = 11,100$, $p = 0.001$, partial $\eta^2 = 0.132$; AES-2: $F(1,73) = 11,020$, $p = 0.001$, partial $\eta^2 = 0.131$) but not in men (AES-1: $F(1,73) = 1,328$, $p = 0.253$, partial $\eta^2 = 0.018$; AES-2: $F(1,73) = 0.002$, $p = 0.969$, partial $\eta^2 < 0.001$). As to other univariate analyses, results showed a reduction of the level of perceived coercion according to the AES 2 scores among participants, who received the foreseen standardized post-coercion review session compared to controls. No effect of gender was found.

Similarly to the analysis of the "as consented" sample, a significant main effect of the covariate age on AES-2 scores was found, whereby decreased AES-2 scores were seen in older participants.

Coercion ladder

Restricted intention-to-treat analysis ("as consented")

The performed two-way ANCOVA showed no significant effect of the standardized post-coercion review session. The main effects of gender, age and the interaction effect of post-coercion review and gender did not reach the significance threshold.

Sensitivity analysis

The per-protocol analysis showed a significant main effect of the foreseen intervention on the mean CL score. A significant interaction effect between intervention and gender ($F(1.77) = 4,210$, $p = 0.044$, partial $\eta^2 = 0.052$) was confirmed. The foreseen intervention had a significant effect regarding female ($F(1.77) = 10,031$, $p = 0.002$, partial $\eta^2 = 0.115$), but not male participants ($F(1.77) = 0.027$, $p = 0.869$, partial $\eta^2 < 0.001$). No significant main effect of gender was found.

The covariate age was significantly related to the CL scores, with the level of subjective coercion decreasing with older age.

https://doi.org/10.1192/j.eurpsy.2021.2256 Published online by Cambridge University Press

Table 4. Descriptive statistics and results of the performed univariate ANCOVAs.

	Restr. intention-to-treat ("as consented")				Per-protocol			
	df	*F*	*p*	Part. η^2	df	*F*	*p*	Part. η^2
CL								
Age	1	2.94	0.090	0.028	1	4.06	0.047*	0.050
Intervention	1	0.45	0.504	0.004	1	5.25	0.025*	0.064
Gender	1	0.16	0.688	0.002	1	0.43	0.516	0.005
Intervention × gender	1	2.95	0.089	0.028	1	4.21	0.044*	0.052
Error	101				77			
Total	106				82			
AES 1								
Age	1	2.38	0.126	0.024	1	1.78	0.186	0.024
Intervention	1	0.15	0.701	0.002	1	1.96	0.166	0.026
Gender	1	0.02	0.878	<0.001	1	0.05	0.832	0.001
Intervention × gender	1	6.63	0.012*	0.065	1	9.62	0.003**	0.116
Error	96				73			
Total	101				78			
AES 2								
Age	1	4.50	0.037*	0.045	1	6.69	0.012*	0.084
Intervention	1	1.89	0.172	0.019	1	5.16	0.026*	0.066
Gender	1	0.82	0.368	0.008	1	0.34	0.562	0.005
Intervention × gender	1	4.51	0.036*	0.045	1	4.91	0.030*	0.063
Error	96				73			
Total	101				78			
CES								
Age	1	1.04	0.310	0.012	1	6.03	0.017*	0.089
Intervention	1	0.92	0.340	0.011	1	2.14	0.148	0.033
Gender	1	0.62	0.434	0.007	1	2.81	0.099	0.043
Index coercive measure	1	6.17	0.015*	0.069	1	11.12	0.001*	0.152
Intervention × gender	1	0.68	0.412	0.008	1	1.58	0.214	0.025
Intervention × coerc. measure	1	1.925	0.169	0.023	1	1.89	0.178	0.029
Error	83				62			
Total	90				69			

Abbreviations: AES, MacArthur admission experience survey; CES, coercion experience scale; CL, coercion ladder; df, degrees of freedom; *F,* ANOVA *F*-value.
*$p < 0.05$;
**$p < 0.01$.

Coercion experience scale

Restricted intention-to-treat analysis ("as consented")

Participants in the intervention group showed slightly lower CES mean scores (M = 95.61, SD = 30.70) compared to those in the control group (M = 97.22, SD = 31.85). Participants who experienced restraint (control: M = 98.35, SD = 33.01; intervention: M = 105.45, SD = 24.79) showed higher CES scores compared to those who experienced seclusion (control: M = 94.81, SD = 30.19; intervention: M = 75.23, SD = 32.53).

The two-way ANOVA yielded no significant main effect of post-coercion review ($F(1,83) = 0.920$, $p = 0.340$) or gender ($F(1,83) = 0.620$, $p = 0.434$). There was a significant main effect of the nature of the index coercive measure ($F(1,83) = 6.170$, $p = 0.015$). There was neither a significant interaction effect between post-coercion review and gender, nor between post-coercion review and kind of the coercive measure.

Sensitivity analysis

In the per-protocol analysis, no significant main effect of post-coercion review ($F(1,62) = 2.144$, $p = 0.148$) or gender ($F(1,62) = 2.807$, $p = 0.099$) could be shown. There was again a significant main effect of the kind of experienced coercive measure ($F(1,62) = 11.120$, $p = 0.001$). No interaction effect between

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intervention and gender or between intervention and the kind of coercive measure was found.

Discussion

The results of this randomized controlled trial could not show a significant main effect of post-coercion review sessions on the experience of subjective coercion during an inpatient stay. Statistical analyses within the sample of all randomized participants who had consented to the study examination failed to yield a significant effect of the intervention on AES and CL scores. Similarly, no effect of the intervention regarding CES scores was found. It therefore has to be questioned whether a single intervention can be deemed sufficient to process a potentially traumatic event like a psychiatric coercive intervention. Results of the pilot study indicate a positive appraisal of the intervention by patients, but also show that there is heterogeneity regarding its timing, content and felt necessity [19]. Moreover, subjective coercion was mainly evaluated with respect to the whole length of the hospital stay, and therefore a whole spectrum of other influential factors like staff attitudes, treatment milieu and concepts, kind and intensity of other therapeutic interventions must be considered. Future research should include a broader range of predictors to capture the determinants of perceived coercion in psychiatry.

However, further analysis revealed interesting results, showing a significant interaction between intervention and gender regarding subjective perceptions of coercion represented by AES 1 and AES 2 scores. Sensitivity analyses confirmed this result in the per-protocol sample and yielded positive main and interaction effects regarding perceived coercion as measured by the CL. These results add to the conclusions of previous works which underlined the positive perception of post-coercion reviews reported by patients [16,30]. The opportunity to reflect on an escalating interpersonal situation together with staff members directly involved in the situation might be linked to its positive effect. Reductions of AES scores found in this study suggest that review sessions may help to reduce experienced negative feelings and can change the perception of the treatment fairness. The setting of the session may enable service users and staff members to acknowledge the gravity of feelings usually experienced during coercive measures. Moreover, review sessions can facilitate the repair and reinforcement of the therapeutic relationship. This is partly suggested by our results regarding the increasing perception of procedural justice and fairness as an effect of the intervention. Besides, the present RCT has also shown a significant reduction of symptoms of PTSD [31]. There again, the mutual reflection process, including the discussion of the motives for the use of coercion, initiated by the review session seemed to mitigate the risk of developing post-traumatic symptoms.

As expected, younger age was associated with higher levels of perceived coercion. This might indicate that younger patients who arenot used to psychiatric settings are more prone to experience inpatient care as harmful or coercive than older patients, who might have experienced even more coercive treatments and settings in the past.

The performed analyses showed that post-coercion review sessions were significantly associated with lower levels of subjectively perceived coercion and the experience of greater fairness and justice in female participants. A previous study yielded that male service users are more prone to experience restraint as compared to women [32], and accordingly, mechanical restraint was more frequently applied in male rather than in female participants in our sample. Despite this fact, female participants in the control group, but not in the intervention group, exhibited higher levels of subjective coercion compared to males at the end of their treatment. Higher levels of perceived coercion among women have already been reported elsewhere [9,10] but to our knowledge, our study is the first to describe gender-specific effects of a therapeutic intervention in this domain.

As a possible explanation, it could be speculated that men more often than women may have experienced coercion or even exerted violence during their treatment, but also in their living or social environment. For this reason, they might probably experience coercion as less offending and as a proportionate response to their violent behavior. The perception of coercion as inevitable might thus explain the poorer effect of review sessions in men, and their lower levels of perceived coercion. Additionally, alcohol or drug use in the context of an escalating situation seems to be more common in men suffering from psychotic disorders [33]. This might foster the perception of a violent situation as less coercive, or even cause amnesia. An alteration of focus and efficacy of the review sessions thus seems plausible in this context.

A greater subjective perception of coercion in female samples might also be related to partly socially influenced behaviors like a more profound emotional responsiveness toward violence or the greater tendency to acknowledge negative feelings and judgments about treatment [34]. Women might also show a greater willingness to emotionally engage in a post-coercion review session than men, and their benefit from it might be linked to a greater degree of psychological mindedness [35]. Eventually, a greater acknowledgment of the therapeutic aspects of the review sessions might be impacted by more pronounced socially desirable response tendencies in females. Women are also more frequently subject to sexual offenses and violence, which all bear a serious traumatic potential that can be reactivated within the psychiatric setting and thus impact their perception of coercion.

These findings suggest the need to differentiate methods of addressing the experience of men and women on psychiatric wards. Further research is needed to assess potential gender differences regarding formal, informal, and subjectively experienced coercion.

It is noteworthy that the significant effect of standardized post-coercion review session on the burden of symptoms of post-traumatic stress was not significantly influenced by gender [31]. This could indicate that although the consequences of coercion and its subjective perception are played down by men because of socially influenced behaviors and thought patterns, the impact of coercive measures on the neuro-vegetative level does not differ between men and women.

As to the level of coercion experienced in direct relation to the applied coercive measures, our analysis showed that restraint was associated with higher levels of subjective coercion compared to seclusion. Although a first RCT did not show any differences between restraint and seclusion, a follow-up study by Steinert et al. also showed higher CES scores among patients who experienced restraint compared to seclusion [29,36]. The present work thus confirms the high coercive potential of mechanical restraint. As to the effect of post-coercion review, the lack of effect of the intervention should not be considered as surprising, as it could be hypothesized that such an intervention does not have the power to retrospectively influence the factual circumstances and the respective burden experienced during a coercive measure, which constitute the main focus of the CES.

Some limitations of the present work must be considered. Firstly, the randomization procedure was chosen to fit the studied population of severely ill people experiencing coercive measures on

https://doi.org/10.1192/j.eurpsy.2021.2256 Published online by Cambridge University Press

psychiatric wards and to allow their recruitment. The targeted study population is per definitionem unable to consent, and therefore Zelen's design had to be applied. As the focused outcome parameters of subjective coercion exceed measures that are collected within clinical routine, the main sample for the analysis consisted of patients, who had been randomized and also actively consented to the study, thus limiting a full intention-to-treat approach. This is important, as only about 25% of patients who had experienced a coercive intervention and were consecutively randomized could be included in the analysis. In addition to the denial of consent, difficulties in contacting potential participants, either because of persistent symptomatology, early, unexpected discharge against medical advice, or communication issues hampered effective recruitment. In many cases coercive interventions were linked to emergency situations before or during admission, and for instance in cases of concomitant substance abuse the reasons to be involuntarily committed to a psychiatric hospital were no longer present the following days. However, this problem reflects on the one hand the daily reality of acute psychiatric wards and the uttermost difficulty to conduct a RCT within this setting; on the other hand, it illustrates the implementation difficulties of a clinical intervention for severely ill patients in the context of acute care. Moreover, is must be noted that post-coercion review sessions are legally required at least in some German federal states, and efforts must be made to guarantee the provision of this intervention also following inpatient hospital treatment. Flexible settings including home treatment and a maximum of therapeutic continuity may facilitate the implementation of the intervention. Alongside the limitations of the statistical power of the analysis, recruitment impediments may have led to selection bias. It is probable that study participants might have been more likely to have a minimally positive attitude toward psychiatry or ward staff, while patients who rejected the offer of hospital support and left the ward as early as possible might have experienced an even higher extent of subjective coercion.

Secondly, and as mentioned, some participants of the intervention group did not receive post-coercion review (or a nonconform version), and some individuals of the control group received an active post-coercion intervention from staff. Most interestingly, eight participants stated that they had not received a post-coercion review, although staff members witnessed it. This could be explained by relational difficulties, florid delusional symptomatology or probably, by choosing a point of time for the intervention, when the person could not fully engage in the process.

Thirdly, the intervention took place after a relatively long period of time after the initial coercive measure, most probably due to the emotional and clinical readiness required to undergo an intervention of this kind. This underlines the necessity to address the issues service users face after a coercive measure and to develop other formats of post-coercion review, specifically tailored to acknowledge service users' individual needs and therapy phase in this context.

Finally, it is worth mentioning that the used instruments AES and CL were not originally designed to evaluate the perception of coercion throughout the hospital stay. Although the used adaptations yielded interesting results, specific instruments are lacking that could capture the whole scope of experienced coercion in inpatient settings.

In conclusion, although the present study did not show a direct impact of post-coercion review sessions on subjective coercion, it is the first to indicate gender-related aspects of such an intervention. The results show that such an intervention can help to alleviate the negative experiences made in the context of psychiatric inpatient care and hopefully prevent their negative impact on the course of illness and treatment, especially among women. Results also indicate a relation between gender-specific aspects and the subjective experience of coercion. This needs to be addressed specifically in the future development and implementation of interventions aiming to reduce coercion.

Data Availability Statement. The data that support the findings of this study are available from the corresponding author, A.W., upon reasonable request.

Author Contributions. Conceptualization: A.W., L.M.; Data curation: A.W., C.M.; Formal analysis: A.W., C.M.; Funding acquisition: A.H., L.M., C.M.; Investigation: A.W., A.V., J.M., L.S., M.S., L.M.; Methodology: A.W., C.M.; Project administration: A.W., A.V., L.M., C.M.; Resources: A.H., F.B., M.S., A. B., O.H., I.H., V.H., L.M., C.M.; Supervision: A.H., F.B., L.M., C.M.; Visualization: A.W., C.M.; Writing—original draft: A.W.; Writing—review and editing: A.V., J.M., L.S., A.H., F.B., M.S., A.B., O.H., I.H., V.H., L.M., C.M.

Funding Statement. The study was funded by the German Federal Ministry of Health as part of the project "Prevention of coercion in psychiatric care."

Conflict of Interest. The authors declare none.

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