

Relationship of sociodemographic and clinical characteristics to mechanical restraint used in a psychiatric hospital in Spain

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Abstract

Background: Coercive measures have been applied in mental health fields throughout history, denying people with mental illness the ability to decide, even though there is increasing evidence that these measures bring few benefits to these individuals.

Objective: The objective of this study was to analyse the sociodemographic and clinical characteristics most likely associated with the use of mechanical restraints (MRs) in psychiatric hospital settings.

Design, Settings and Participants: This was a descriptive, comparative and analytical cross-sectional study in people with mental disorders who were hospitalized in two hospitals in the Autonomous Valencian Community (Spain). We included a total of 91 participants who completed the Scale to Assess Unawareness of Mental Disorder (SUMD), Positive and Negative Syndrome Scale (PANSS), Barrat's Impulsiveness Scale and the Hamilton Anxiety Scale.

Results: The results we collected indicated that the patients most likely to be mechanically restrained were younger people with less awareness of their symptoms and disease, previous admissions to a psychiatric hospital and cohabitation with parents and/or family. In addition, having been admitted involuntarily, previously having had MRs applied, presenting more positive psychotic symptoms and habitual caffeine consumption all predicted the use of MRs.

Conclusions: The variables that were able to predict MR were involuntary admission, previous use of MR, the presence of positive psychotic symptoms and caffeine consumption.

Implications for the Profession and/or Patient Care: Evaluation of the sociodemographic and clinical characteristics of patients can help health professionals, especially nurses, to recognize patients who are at risk of requiring MR. This allows mental health practitioners to take these factors into account during interventions or when implementing programmes designed to reduce the use of coercive measures in psychiatric hospital settings.

Impact:

- What problem did the study address? Coercive measures have been applied in mental health fields throughout history, with no benefits to these patients.

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- What were the main findings? There are studies that relate some variables to MR in psychiatric settings, but we have been able to find variables capable of predicting MR such as involuntary admission, previous use of MR, the presence of positive psychotic symptoms and caffeine consumption.
- Where and on whom will the research have an impact? The findings of this study allow for the reduction of MRs in psychiatric units. The sociodemographic and clinical characteristics found to be related to MR will help professionals identify when a patient is admitted in order to use specific interventions aimed at preventing the use of MRs during admission. This is the first study to indicate a relationship between caffeine consumption and the use of MRs. Further studies will be necessary to verify if controlled caffeine supplementation during admission to psychiatric units could become an additional strategy contributing to preventing the application of MR specifically in individuals who habitually consume coffee or caffeine-containing beverages daily.

Reporting Method: We have adhered to relevant EQUATOR guidelines using the STROBE reporting method.

Patient Contribution: No patient or public contribution.

KEYWORDS

awareness of illness, caffeine consumption, mechanical restraint, positive psychotic symptoms, psychiatric hospital setting

1 | BACKGROUND

Throughout history, people with mental illness have sometimes been denied the ability to decide how they are treated and their care in health systems has relied too heavily on coercive measures (Szmukler, 2015). Some countries are trying to implement interventions aimed at empowering patient rights in decision-making in order to reduce the coercive methods used by the personnel who care for them (Sugiura et al., 2020).

Although some authors evidence on the scant benefits and numerous negative effects of the use of mechanical restraint (MR; Jalil et al., 2020; Thomann et al., 2021), its application continues to be common in many hospitals. Australia sought to find out the duration and the reasons for the use of MR in its hospitals, reaching the conclusion that those subjected to this technique were consumers, and the main reason was the risk of causing harm to others (McKenna et al., 2017). The Bioethics Committee of Spain, in its report on ethical considerations regarding the use of mechanical and pharmacological restraints in social and healthcare settings, details that the prevalence of restraint use in Spain is significantly higher (40%) compared to other countries in our environment, such as France, Italy, Norway or the United States, where it is used in 15% of eligible cases, or in Switzerland, Denmark, Iceland or Japan, where it is applied in 10% (López et al., 2016).

The current new paradigm centred on human rights has led to significant research on the use of coercive practices but reducing them towards total abolition still remains a challenge (Whittington et al., 2023). The fact of adopting strategies based on information

What does this paper contribute to the wider global clinical community?

This paper gives the professionals the main factors to prevent the use of mechanical restraints in people admitted to mental health units.

This paper also includes the habitual caffeine consumption as a predictive factor of mechanical restraints use.

about the trauma that mechanical coercion can produce seems to reduce its use, but solid conclusions cannot be drawn about it (Kelly et al., 2023). In addition, attempts to train professionals to reduce coercive practices through paradigm shifts in mental health inpatient units have not been entirely effective. Some reasons put forward for this include resource limitations, unfavourable legislative frameworks, the need to maintain the status quo and differences in power between the different professionals who care for patients. Thus, the need for a shift away from the use of coercive restriction measures as part of patient management has been proposed (Every-Palmer et al., 2021). This would mean that a new paradigm must be assumed by the therapeutic care teams in mental health hospitalization rooms, especially the nursing staff. Some strategies that are being carried out to reduce and prevent mechanical restrictions are the creation of the work of the Fostering and Strengthening Approaches to Reducing Coercion in European Mental Health Services (FOSTREN)

Network or (Berring & Georgaca, 2023) or the six core strategies (Leadership Toward Organizational Change, Use of Data, Work Force Development, Use of 5/R Prevention Tools, Consumer Roles in Inpatient Settings Debriefing Tools) of Huckshorn (2004).

Furthermore, some authors have advanced research into the characteristics of patients that have required MR, with the aim of designing personalized measures that can prevent the need for the use of MR. Indeed, several studies have shown the relationship between certain sociodemographic characteristics and MR, including male gender (Pérez-Revuelta et al., 2021), younger age (Guzmán-Parra et al., 2016; Pérez-Revuelta et al., 2021), marital status single (Miodownik et al., 2019), involuntary admission (Pérez-Revuelta et al., 2021), previous psychiatry hospital admissions (Guzmán-Parra et al., 2016) and/or previously having required MR (Pérez-Toribio et al., 2022).

Regarding clinical variables, some studies have also shown the relationship between the type of mental disorder and the use of MR, with schizophrenia and other psychoses being a possible risk factor (Moghadam et al., 2014), and bipolar disorder also having been linked to the use of MR (Moghadam et al., 2014). There is also scientific evidence linking the application of restraints to patients with personality disorders (Kodal et al., 2018; Miodownik et al., 2019; Moghadam et al., 2014). Another psychopathological factor that has been related to receiving MR is substance abuse (Moghadam et al., 2014). Impulsivity and emotional dysregulation are closely related to each other, but their relationship with coercive measures has been little studied, despite the fact that hospitalized patients who show impulsivity alter their environment and cause unsafe scenarios (Naya, 2022).

The literature presented above suggests the need to further explore the reasons for MR to reduce its use (Thomann et al., 2021). Knowing the underlying mechanisms of restraint is useful to develop strategies that minimize these practices (El-Abidi et al., 2021).

In Spain, MR is one of the most used coercive measures (Raboch et al., 2010). Therefore, the objective of this study was to analyse the sociodemographic and clinical characteristics most likely associated with the use of MR in psychiatric hospital settings environments with the purpose of identifying specific characteristics upon patient admission to prevent the potential risk of MR. Our hypotheses were that there would be significant differences between (1) restrained and non-restrained individuals based on their sociodemographic characteristics (age, sex, marital status, nationality, educational level, cohabitation status and dependence on others); (2) restrained and non-restrained individuals based on their clinical characteristics (hospital admission type, previous admissions, previous use of restraints, number of prior restraints, impulsivity and anxiety); (3) restrained and non-restrained patients according to the mental disorders they present; and (4), restrained and non-restrained individuals based on their substance use history. These differences could serve in the future to establish specific and personalized intervention plans with the aim of reducing the use of MR.

2 | METHODS

2.1 | Design

This was a descriptive, comparative and analytical cross-sectional study conducted in a group of people with mental disorders admitted to a psychiatric hospital setting.

2.2 | Study site and participants

This study was carried out in two hospitals in the Valencian Community, Spain (one in Castellón and another in Valencia). The data were collected between the months of October 2021 and June 2022. The participants were obtained by non-consecutive purposive sampling among the individuals admitted to the hospital responsible for managing mental health admissions. Once they entered and agreed to participate in this study, they were classified into two groups based on whether or not they were subjected to coercive measures during their admission.

In both hospitals, this study was carried out in the mental health emergency unit and in the short-term hospitalization unit (STHU) for mental health in which the application of chemical and MRs is frequent.

The inclusion criteria were as follows: (1) hospitalized patients in the study units; (2) age over 18 years; (3) patients who understood Spanish and voluntarily signed their acceptance to participation in this study and freely gave their informed consent. Two comparison groups were formed: (1) people admitted to the STHU who had experienced a MR coercive measure during their hospital stay (during their emergency room admission under the care of the mental health unit, or during their stay in the STHU); and (2) people admitted to the STHU on whom no MR measures had been applied. The exclusion criteria were as follows: (1) having an intellectual disability that prevented completion of the questionnaires; (2) patients who, despite having been subjected to a coercive measure in the emergency room, were not admitted to the STHU or were discharged within 24 h of the coercive measure having been applied.

According to the calculations performed with G*Power software (v3.1.9.4), a sample size of 36 participants in each group ($N=72$) was required to detect significant differences with a Student *t*-test with an effect size of 0.6, alpha 5% and power of 80%. To perform chi-squared tests with similar parameters, a total sample of 36 was required. Participation in this study was offered to 102 patients, of whom 11 declined and 91 agreed and signed the informed consent. A MR measure was applied to 50 patients and was not applied to 41 patients during their hospital admissions.

2.3 | Data collection and procedure

Sociodemographic and clinical data were collected from computerized patient medical records. The following psychometric instruments were used:

- The Scale to Assess Unawareness of Mental Disorder (SUMD; Amador et al., 1993), a standardized scored interview with the patient. The reduced version from Ruiz et al. (2008) comprises three general items to assess awareness of having a mental disorder, the effects of drugs and the social consequences of mental disorder, with another six items used to assess specific symptoms. The patient's awareness and attribution of these symptoms are evaluated for each of these items.
- The Positive and Negative Symptom Scale (PANSS), a semi-structured interview lasting about 30–40 min that allows direct observation of the motor, affective, cognitive, perceptual, attentional, integrating and interpersonal behaviour of the person being evaluated. The information collected is reported by the clinician and refers to the week prior to the evaluation. Once this interview is finished, the clinician must complete a 30-item survey divided into three subscales: positive symptoms, general psychopathology and negative symptoms (Wójciak & Rybakowski, 2018).
- The Barrat Impulsivity Scale (1995), adapted by Oquendo et al. (2001), a self-administered survey comprising 30 questions grouped into three subscales: cognitive impulsivity, motor impulsivity and unplanned impulsivity. A 4-point Likert scale ranging from 'rarely' or 'never' to 'always' or 'almost always' is used. In addition, an overall score is also obtained. There are no cut-off points, although use of the distribution median has been proposed as follows: total score=32.5; cognitive impulsivity=9.5; motor impulsivity=9.5 and unplanned impulsivity=14 (Oquendo et al., 2001).
- The Hamilton Anxiety Scale (Hamilton, 1959), heteroadministered by a clinician. Lobo et al. (2002) adapted this scale to Spanish and validated its reduced 17-item version, with an alpha reliability coefficient of 0.89. A Likert scale is used, scoring each item from 0 to 4 ('absent', 'mild', 'moderate', 'severe' and 'very severe') to assess both the intensity and frequency of the symptoms. Two scores can also be obtained, which correspond to psychic anxiety (items 1, 2, 3, 4, 5, 6 and 14) and somatic anxiety (items 7, 8, 9, 10, 11, 12 and 13). There are no cut-off points, but higher scores indicate greater intensity of anxiety.

In this work, the ORION CLINIC and PRISMA computer programs as well as the MR record sheets were reviewed daily to detect the use of MRs. The aforementioned scales were always applied to patients by a professional other than those that had participated in the applying a MR. Based on the data obtained regarding the use of coercive measures, the participants were classified into two groups: the group to which a coercive MR measure had been applied during admission ($n=50$) and the group to which no coercive MR measure had been applied ($n=41$). The data obtained were included alongside the numerical code for each participant in a database specifically designed for this purpose and to which only the study researchers had access. Before the discharge of each participant, their medical history was accessed to complete the data regarding the restraints applied during their admission to the emergency room or hospitalization room, as well as their clinical diagnosis according to the ICD-10.

2.4 | Data analysis

The data were analysed using SPSS software version 25.0 (IBM Corp., Armonk, NY). The exploratory and descriptive analysis showed that the distribution of most of the data variables were far from normal. Thus, the groups were compared using non-parametric Mann–Whitney U tests for quantitative variables and Pearson chi-squared tests for categorical variables. The application of a restraint was used as the independent variable, and the sociodemographic and clinical variables of impulsivity, anxiety, awareness of illness, presence or absence of personality disorder and difficulty in emotional regulation were used as dependent variables. Probabilities less than $\alpha=.05$ were considered significant in all the analyses. Finally, the data were modelled using binary logistic regression with the conditional forward method, introducing the variables for which there were significant differences between the groups plus the sex variable to check if they could predict the probability of a patient being subjected to MR.

2.5 | Ethical considerations

This study was governed by the principles contemplated in the Declaration of Helsinki, 2013, Organic Law 3/2018 of December 5 on the Protection of Personal Data and the Guarantee of Digital Rights, and Regulation (EU) 2016/679 of the European Parliament and Council of 27 April 2016 on Data Protection (RGPD). The study was approved by the Ethics Committee at the two participating hospitals: the Hospital Clínico Universitario of Valencia (ref. 2021/239) and the Provincial Hospital of Castellón (CEIm-31-03).

3 | RESULTS

Of the 91 individuals included in this study, 79.1% were male ($n=72$) and their mean age was 43.5 years (SD 15.4 years). Fifty cases of MR were selected, of which 80% were in men ($n=40$) with a mean age of 39.0 years (SD 14.05). Table 1 shows the sociodemographic and clinical characteristics of the total sample and the two groups studied, as well as comparisons between the individuals who were restraint or not. There were significant differences in their age ($U=635.5$; $p=.002$), cohabitation status ($\chi^2=12.150$; $p=.033$), voluntary admission ($\chi^2=15.980$; $p<.001$), previous admissions ($\chi^2=15.970$; $p<.001$), the prior use of restraints ($\chi^2=21.912$; $p<.001$) and the number of previous MRs ($U=518$; $p<.001$). Thus, the patients that had been restrained were younger, more often lived with their parents or family, more frequently were involuntary admissions and had a record of previous admissions and prior use of restraints.

Table 2 shows the data and comparisons regarding substance use among the patients included in this study. It is worth noting that the only differences found referred to caffeine consumption ($\chi^2=4.876$; $p=.027$) and opioid use ($\chi^2=5.102$; $p=.024$).

TABLE 1 The sociodemographic and clinical characteristics of patients with mental disorders according to whether or not they were subjected to the use of a mechanical restraint.

Variables	Total (N=91)			U/ χ^2 p
	M \pm SD			
	Median \pm IQR/% (n)	Restraint (N=50)	No restraint (N=41)	
Age	43.46 \pm 15.40 46.00 \pm 22.00	39.04 \pm 14.05 39.00 \pm 22.50	48.85 \pm 15.41 51.00 \pm 19.00	635.5** .002
Gender				
Men	79.1 (72)	80.0 (40)	78.0 (32)	0.052
Women	20.9 (19)	20.0 (10)	22.0 (9)	.820
Marital status				
Single	53.3 (48)	61.2 (30)	43.9 (18)	3.806
Married/Partner	23.3 (21)	18.4 (9)	29.3 (12)	.228
Widower	4.4 (4)	2.0 (1)	7.3 (3)	
Separate	18.9 (17)	18.4 (9)	19.5 (8)	
Nationality				
Spanish	90.1 (82)	90.0 (45)	90.2 (37)	6.958
Ecuador	2.2 (2)	2.0 (1)	2.4 (1)	.325
Romania	3.3 (3)	6.0 (3)	0.0	
Other	4.4 (4)	2.0 (1)	7.2 (3)	
Education level				
No school certificate	5.5 (5)	6.0 (3)	4.9 (2)	1.161
Primary school	24.2 (22)	26.0 (13)	22.0 (9)	.884
Secondary school	19.8 (18)	16.0 (8)	24.4 (10)	
Baccalaureate or vocational training (16–18 years)	34.1 (31)	34.0 (17)	34.1 (14)	
Diploma/University degree	16.5 (15)	18.0 (9)	14.6 (6)	
Employment status				
Studying	6.7 (6)	10.0 (5)	2.6 (1)	6.547
Working	19.1 (17)	24.0 (12)	12.8 (5)	.162
Unemployed	37.1 (33)	38.0 (19)	35.9 (14)	
Pensioner	36.0 (32)	28.0 (14)	46.2 (18)	
Institutionalized	1.1 (1)	0.0	2.6 (1)	
Cohabitation				
Alone	34.8 (31)	32.0 (16)	38.5 (15)	12.150*
Partner	16.9 (15)	10.0 (5)	25.6 (10)	.033
Partner and children	9.0 (8)	6.0 (3)	12.8 (5)	
Parents and/or family	36.0 (32)	50.0 (25)	17.9 (7)	
Institution	1.1 (1)	0.0	2.6 (1)	
Shared flat	2.2 (2)	2.0 (1)	2.6 (1)	
Dependence				
Independent	58.2 (53)	54.0 (27)	63.4 (26)	1.428
Help from others	11.0 (10)	10.0 (5)	12.2 (5)	.490
Dependent on others	30.8 (28)	36.0 (18)	24.4 (10)	
Clinical diagnosis				
Affective disorder	44.3 (39)	37.5 (18)	52.5 (21)	5.362
Psychotic disorder	48.9 (43)	56.3 (27)	40.0 (16)	.147
Borderline personality disorder	4.5 (4)	2.1 (1)	7.5 (3)	
Others	2.3 (2)	4.2 (2)	0.0	

(Continues)

TABLE 1 (Continued)

Variables	Total (N=91)			U/χ^2
	$M \pm SD$			
	Median \pm IQR/% (n)	Restraint (N=50)	No restraint (N=41)	p
Admission type				
Voluntary	38.5 (35)	20.0 (10)	61.0 (25)	15.980**
Involuntary	61.5 (56)	80.0 (40)	39.0 (16)	<.001
Previous psychiatric admission				
Yes	55.7 (49)	75.0 (36)	32.5 (13)	15.970**
No	44.3 (39)	25.0 (12)	67.5 (27)	<.001
Previous mechanical restraints				
Yes	39.3 (35)	61.2 (30)	12.5 (5)	21.912**
No	60.7 (54)	38.8 (19)	87.5 (35)	<.001
Number of previous mechanical restraints	1.90 \pm 4.89	2.92 \pm 6.06	0.65 \pm 2.43	518**
	0.00 \pm 2.00	1.50 \pm 3.25	0.00 \pm 0.00	<.001

Note: The groups with significant differences are shown in bold.

* $p < .05$. ** $p < .01$.

Specifically, patients that had been restrained more frequently consumed caffeine while those that had not more often consumed opiates.

Table 3 shows the psychopathological variables and comparisons between the groups for these aforementioned variables. Significant differences were found in patients with positive symptoms ($U=430$; $p < .001$) evaluated with the PANSS, illness awareness ($U=605$; $p = .001$) and symptoms awareness ($U=710$; $p = .011$) evaluated with the SUMD. Specifically, the individuals that had been restrained presented more positive symptoms of psychosis, less awareness of their illness and more emotional awareness.

Lastly, Table 4 shows the results of the binary logistic regression, with the variables of involuntary admission, previous use of restraints, positive symptoms and caffeine consumption making it possible to predict the use of MR.

4 | DISCUSSION

The use or lack of use of MR is an important indicator of quality of care in the psychiatric hospitalization ward (Jalil et al., 2020). The scientific literature suggests the need to further explore the reasons leading to the use of coercive measures among mental health patients in order to try to reduce the use of MR (Thomann et al., 2021).

The results of this study showed significant differences between patients who were or were not subjected to the use of MR in terms of some sociodemographic characteristics and some other factors related to their admission.

The age range that has shown a higher probability of MR is young adults (25–40 years old), as reflected in our study and in the previous study by Abderhalden et al. (2002) or more recently by Pérez-Revuelta et al. (2021). This life period may be associated with a series

of challenges and responsibilities that could result in additional limitations for these individuals. It would be interesting to further investigate the causes and implications of these restrictions to better understand how they affect the quality of life and health of these individuals.

Regarding other variables such as gender, marital status and nationality, there is still some controversy in the academic literature regarding their influence on the use of MR. Some studies have found that male gender (Pérez-Revuelta et al., 2021), single marital status (Miodownik et al., 2019) and being an immigrant (Guzmán-Parra et al., 2016) are associated with a higher use of MR. However, these findings do not align with our results, as none of these characteristics had a significant influence on this form of restraint. Andersen and Nielsen (2016) also found no differences regarding the gender of patients subjected to MR. These discrepancies in results are likely due to differences in the frequency and duration of coercive measures between men and women due to the subjective perception of staff that male patients behave more aggressively (Ketelsen et al., 2022).

Another sociodemographic variable collected in our study was the patient's living situation at home, which, to date, no other study has analysed in relation to MR. In Spain, a culture of 'familism' predominates (León et al., 2014) which, together with the difficulties that people with a mental illness have in becoming independent and autonomous, are forced to depend on family support. As our results show, increased use of MR was observed more frequently in patients living with their parents or relatives of origin, compared to those living independently with their partner. This association could be explained because living with parents or relatives is related to lower social functionality and autonomy, which in turn could make adaptation and management during hospital admission difficult, thus favouring the use of MR.

The findings found in this investigation also showed significant differences in some clinical characteristics such as substance use

TABLE 2 Substance use of patients with mental disorders according to whether or not they were subjected to mechanical restraint.

Variables	Total (N = 91), % (n)	Restraint (N = 50)	No restraint (N = 41)	χ^2 p
Nicotine				
Yes	53.8 (49)	62.0 (31)	43.9 (18)	2.969
No	46.2 (42)	38.0 (19)	56.1 (23)	.085
Caffeine				
Yes	34.1 (31)	44.0 (22)	22.0 (9)	4.876*
No	65.9 (60)	56.0 (28)	78.0 (32)	.027
Alcohol				
Yes	38.5 (35)	34.0 (17)	43.9 (18)	0.933
No	61.5 (56)	66.0 (33)	56.1 (23)	.334
Cannabis				
Yes	34.1 (31)	36.0 (18)	31.7 (13)	0.185
No	65.9 (60)	64.0 (32)	68.3 (28)	.667
Cocaine				
Yes	20.9 (19)	20.0 (10)	22.0 (9)	0.052
No	79.1 (72)	80.0 (40)	78.0 (32)	.820
Opiates				
Yes	4.4 (4)	0.0	9.8 (4)	5.102*
No	95.6 (87)	100.0 (50)	92.2 (37)	.024
Benzodiazepines				
Yes	19.8 (18)	26.0 (13)	12.2 (5)	2.706
No	80.2 (73)	74.0 (37)	87.8 (36)	.100
Amphetamines				
Yes	3.3 (3)	2.0 (1)	4.9 (2)	0.585
No	96.7 (88)	98.0 (49)	95.1 (39)	.444
Others				
Yes	8.8 (8)	12.0 (6)	4.9 (2)	1.425
No	91.2 (83)	88.0 (44)	95.1 (39)	.233
Substance use disorder				
No	76.7 (69)	77.6 (38)	75.6 (31)	8.231
Nicotine	8.9 (8)	10.2 (5)	7.3 (3)	.112
Alcohol	6.7 (6)	2.0 (1)	12.2 (5)	
Cannabis	4.4 (4)	8.2 (4)	0.0	
Cocaine	2.2 (2)	2.0 (1)	2.4 (1)	
Benzodiazepines	1.1 (1)	0.0	2.4 (1)	

Note: The groups with significant differences are shown in bold.

* $p < 0.05$.

and psychiatric symptoms. Regarding clinical diagnosis, multiple studies have shown a clear relationship between the use of MR and psychotic disorders, affective disorders and substance use (Dack et al., 2013). However, in contrast to Kodal et al. (2018), in our study, we found no relationship between the application of MR and affective disorders or psychotic disorders. Nevertheless, we were able to relate the positive symptomatology of psychosis and absence of awareness of the disease with the use of MR.

Our results also showed that involuntary hospital admission was related to MR, which was consistent with other studies

(Pérez-Revuelta et al., 2021). In addition, we found that having had prior admissions and/or previously having been subjected to MR increased the risk of requiring MR during hospital admission, as have other studies that were similarly able to verify that previous admissions were related to MR (Pérez-Toribio et al., 2022). The question is whether this is due to inherent patient characteristics that increase their likelihood of MR or to biases of professionals regarding previously immobilized individuals. In a systematic review on the topic (Doedens et al., 2020), it was observed that the perception of nursing staff was shifting paradigms, considering the use of MR important

Variables	Total (N = 91)	Restraint (N = 50)	No restraint (N = 41)	U
	M ± SD	M ± SD	M ± SD	
	Median ± IQR	Median ± IQR	Median ± IQR	p
PANSS positive symptoms	14.03 ± 6.93 12.00 ± 12.00	17.00 ± 6.85 17.00 ± 10.00	10.41 ± 5.12 7.00 ± 6.00	430** <.001
PANSS negative symptoms	12.27 ± 7.89 9.00 ± 8.00	10.92 ± 5.52 7.00 ± 6.25	13.92 ± 9.88 10.00 ± 10.00	862 .174
PANSS psychopathology	30.73 ± 9.97 29.00 ± 13.00	31.16 ± 9.85 30.00 ± 14.00	30.21 ± 10.21 29.00 ± 14.50	953.5 .568
BARRAT-Cognitive impulsivity	15.24 ± 5.32 15.00 ± 7.00	15.12 ± 5.21 15.00 ± 7.00	15.39 ± 5.52 15.00 ± 7.00	977 .701
BARRAT-Motor impulsivity	15.34 ± 9.09 14.00 ± 13.00	16.22 ± 9.00 15.00 ± 11.50	14.27 ± 9.19 14.00 ± 13.75	864.5 .340
BARRAT-Unplanned impulsivity	21.38 ± 7.79 21.00 ± 13.00	22.22 ± 7.91 22.00 ± 10.00	20.36 ± 7.62 20.00 ± 13.00	898.5 .312
BARRAT-Total impulsivity	51.95 ± 18.17 52.00 ± 26.00	53.42 ± 17.58 53.00 ± 24.50	50.15 ± 18.94 50.50 ± 33.00	892 .468
Hamilton Anxiety Scale—Mental anxiety	10.73 ± 6.56 11.00 ± 10.00	10.86 ± 6.97 11.00 ± 9.25	10.58 ± 6.11 9.00 ± 9.50	1023 .987
Hamilton Anxiety Scale—Somatic anxiety	8.39 ± 6.67 8.00 ± 12.00	8.62 ± 6.85 8.00 ± 12.50	8.12 ± 6.53 7.00 ± 11.00	985 .749
Hamilton Anxiety Scale—Total anxiety	19.13 ± 12.62 19.00 ± 22.00	19.48 ± 13.09 21.50 ± 21.25	18.70 ± 12.17 16.00 ± 20.50	1025 1
SUMD—Disease awareness	7.69 ± 5.31 7.00 ± 10.00	9.44 ± 4.99 10.00 ± 11.25	5.56 ± 4.96 3.00 ± 5.00	605** .001
SUMD—Symptoms awareness	2.64 ± 1.90 2.75 ± 4.00	3.14 ± 1.81 3.58 ± 3.06	2.03 ± 1.85 1.00 ± 2.50	710* .011
SUMD—Symptoms attribution	1.97 ± 2.05 1.00 ± 4.33	2.15 ± 2.16 1.00 ± 5.00	1.76 ± 1.92 1.00 ± 3.46	960.5 .593

Note: The groups with significant differences are shown in bold.

Abbreviations: PANSS, Positive and Negative Syndrome Scale; SUMD, Scale to Assess Unawareness of Mental Disorder.

*p < 0.05. **p < 0.01.

Variables	Adjusted OR	95% CI	p
Involuntary admission (RC: voluntary admission)	17.90	(2.70, 118.35)	0.003**
Previous restraints (RC: no)	27.69	(3.59, 213.25)	0.001**
PANSS positive symptoms	1.35	(1.13, 1.61)	0.001**
Caffeine consumption (RC: no)	14.31	(2.29, 89.17)	0.004**

Note: The variables that have shown significant differences between the groups plus the sex variable are included in the model. Therefore, the ORs are adjusted for sex, age, cohabitation, type of admission, previous admissions, previous restraints, caffeine consumption, consumption of opiates, PANSS positive symptoms, disease awareness and symptom awareness.

Abbreviations: CI, confidence interval; OR, odds ratio; PANSS, Positive and Negative Syndrome Scale; RC, reference category.

**p < 0.01.

for both patient and staff safety. This could explain why staff resort to MR at the slightest sign of agitation in order to prevent violence that occurred in previous situations with the same patient.

Therefore, it is crucial to highlight the importance of tools such as the Brøset Violence Checklist (Almvik et al., 2000) and trauma-informed care-based strategies (Azeem et al., 2011), as they have

TABLE 3 The psychopathological variables of patients with mental disorders according to whether or not they had been subjected to mechanical restraint.

TABLE 4 The use of binary logistic regression to identify variables that predicted the use of mechanical restraint in the hospital setting among patients with mental disorders (RC: no restraint).

shown effectiveness in assessing suicide risk and preventing violence in clinical settings.

Impulsivity and anxiety can be the beginning of an escalation of agitation with aggressive and violent behaviours (Garriga et al., 2017). However, our results have not been able to establish a relationship between these variables and increased use of MR. It would be interesting to conduct further studies to delve into this relationship and better understand the characteristics that lead clinical staff to use MR.

Furthermore, substance use has also been related in the literature to the use of MR in patients admitted to psychiatric hospitalization wards (Mårtensson et al., 2019). However, our study is the first to examine and relate caffeine consumption to the use of MR, although we were unable to find any studies evaluating the possible relationship between caffeine use disorder and MR. Even though the consumption of caffeine is very common all over the world, the withdrawal syndrome generated by stopping its use is underestimated in the general population and especially among hospitalized patients (Agritelle & Goldberger, 2021). Nonetheless, in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5) from the American Psychiatric Association recognizes caffeine withdrawal. This happens when there is a prolonged daily consumption of caffeine which is abruptly stopped or reduced, leading to the appearance of three or more of the following symptoms in the subsequent 24 h: headache, fatigue or notable drowsiness, mood alteration, difficulty concentrating and/or flu-like symptoms (American Psychiatric Association, 2014).

Our findings could perhaps be explained by the caffeine withdrawal that occurs when use of the substance is stopped abruptly, with symptoms including dysphoria and irritability (American Psychiatric Association, 2014). In heavy users, the symptoms may appear as early as 3–6 h after withdrawal and their maximum manifestation occurs 20–51 h after withdrawal and can even last for up to 9 days (Juliano & Griffiths, 2004). Thus, there is a positive association between daily caffeine intake and the appearance and severity of the withdrawal symptoms (Evans & Griffiths, 1999). This is relevant because caffeine is usually restricted in hospitalization units to avoid the possibility that it might exacerbate clinical symptoms. However, this also increases the risk of caffeine withdrawal syndrome appearing during admission. This could explain the higher incidence of the use of MR in the first few days of admission among these patients. A change in mood may appear in patients and the symptoms of caffeine withdrawal may even be confused with psychiatric illness or lead to poor management of their disease. Moreover, the long-term use of caffeine and the syndrome its withdrawal causes could be confused in psychiatric units with the side effects of certain drugs introduced during treatment, perhaps even interfering with the plasma levels of psychotropic drugs (Shapiro, 2020).

It would be interesting to study if offering one or two caffeinated beverages a day in a controlled manner in psychiatric units could mitigate or reduce caffeine withdrawal symptoms and consequently, reduce the number of times MR is implemented, in addition to allowing

better adjustment of the prescribed medications patients will take after hospital discharge.

4.1 | Limitations

Finally, it is important to note that various constraints should be taken into account when evaluating this study. Firstly, it could be a limitation that there does not seem to be any previous articles on some findings of our study such as the patient's living conditions at home or caffeine consumption. Regarding the generalizability of the results, the fact that our sample was performed only in acute psychiatric patients makes it difficult to extrapolate the results to chronic psychiatric environments or other countries where the functioning of acute care units is different. In addition, the data came only from two psychiatric hospitals meaning that the findings are not generalizable to other units such as geriatrics, internal medicine or people with disabilities who also require MR at certain times. Sampling was carried out in a non-consecutive and non-random manner (due to the organizational functioning of the unit) so this may imply a bias, as well as not allowing us to calculate the percentage of MR with respect to the total number of hospitalized patients. The regression results must be interpreted with quite caution given the wide confidence intervals obtained. This may be due to the high number of predictor variables with respect to the included sample and the asymmetry of the variables, which can significantly distort the results. The cross-sectional design of the study does not allow inferring causality. In this sense, the power of the study may be low to detect the influence of variables found in other studies. In addition, the diagnoses were made by psychiatrists from the psychiatry unit and were collected from the patient's clinical history, meaning that their reliability was unproven, perhaps explaining why psychotic disorder was not significant but the positive symptoms evaluated by the PANSS were. Finally, having experienced a pandemic situation and prolonged isolation could have also changed the personal factors of the patients and/or the institution itself, compared to the previous baseline prior to the COVID-19 pandemic (Peraire et al., 2023).

5 | CONCLUSIONS

Knowing the sociodemographic and clinical variables of patients admitted to a psychiatric unit is important to reduce the use of MR. In this study, differences have been found in terms of the age of the patients, with MR being more frequent in the younger ones. Furthermore, living with parents or relatives, having had previous admissions to psychiatric hospital settings and low awareness of symptoms and the disease itself have been related to a greater number of MRs.

On the other hand, the only variables that were able to predict MR were involuntary admission, previous use of MR, the presence of positive psychotic symptoms and caffeine consumption.

AUTHOR CONTRIBUTIONS

MCR, IAF, CLI and MMM: Made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; MCR, IAF and GHC: Involved in drafting the manuscript or revising it critically for important intellectual content; MCR, IAF, MMM, ABD, CLI and GHC: Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; MCR, IAF and GHC: Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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CONFLICT OF INTEREST STATEMENT

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

STATISTICAL GUIDELINES

The authors have checked to make sure that our submission conforms as applicable to the Journal's statistical guidelines and there is a statistician on the author team and her name is Ana Benito.

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