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ORIGINAL ARTICLE

Elevated Rates of Restraint and Seclusion in Child and Adolescent Psychiatric Inpatients in China and Their Associated Factors

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Abstract

To investigate the rate of restraint and seclusion (R&S) use in child and adolescent psychiatric inpatients in China and to examine factors associated with use of these interventions. As part of an official national survey, 41 provincial tertiary psychiatric hospitals in China were selected. Data from 196 youth inpatients discharged from these hospitals from March 19 to 31, 2019 were retrieved and analyzed. (1) The overall rate of R&S was 29.1% (N = 57) and the rate of restraint was 28.6% (N = 56), and seclusion was 11.7% (N = 23) respectively. (2) Compared to patients who did not require R&S, those who required R&S were more likely to have been hospitalized on an involuntary basis, more likely to present with either manic symptoms or aggressive behavior as primary reason for admission, had more frequent aggressive behaviors during hospitalization, and had a significantly longer length of stay. (3) A logistic regression showed that aggressive behaviors during hospitalization was significantly associated with the use of R&S (OR = 21.277, $p < 0.001$), along with three other factors: manic symptoms as a reason for admission, involuntary admission and a lower GAF score at admission (all $p < 0.01$). The rate of R&S is dramatically higher in child and adolescent psychiatric hospitalizations in China compared to other regions. Targeted training of staff, development of precise operational guidelines for appropriate use of R&S, and strict oversight are urgently needed to minimize the inappropriate use of R&S in child and adolescent patients.

Keywords Child · Adolescent · China · Seclusion · Restraint

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Introduction

Psychiatric disorders are a leading cause of hospitalization for children and adolescents between ages 5 to 19 years old in China and appear to be increasing in adolescents ages 10 to 14 years old [1, 2]. Psychiatric hospitalization of children and adolescents may provide a structured setting to alleviate them from community stressors and maintain safety, and to provide close monitoring, observation for diagnostic clarity, rapid titration of psychotropic medications, and intensive psychosocial interventions, leading to improvement in functioning and symptoms [3, 4]. However, psychiatric hospitalization inherently restricts a patient's rights, and any action that diminishes the rights of child or adolescent patient must be justified to be in the best interest of the patient, given the ethical duty to protect the rights of children [5, 6].

While hospitalization itself is restrictive, more restrictive measures, such as restraint and seclusion (R&S) are required for some patients who cause harm to themselves or others and do not respond to other interventions. Several kinds of physical restraints exist and range from mechanical devices used for immobilization to manual holds by the staff. Seclusion is the confinement of the patient in a locked room from which he cannot exit on his own [7]. The use of R&S in psychiatric patients, especially children and adolescents, is one of the most controversial and highly regulated practices in mental health treatment in many parts of the world. The primary goal of R&S in inpatient psychiatric settings is to maintain the safety of everyone in the treatment environment, and should be considered as a last resort after every other intervention has failed to maintain safety [8, 9]. However, the use of R&S in children and adolescents in psychiatry hospitals is not currently regulated in China.

Previous studies estimated that the prevalence of restrictive measures in adult inpatient psychiatric hospitalization range between 3.8% (in Finland) and 20% (in Japan), with wide variations in different surveys. R&S are associated with agitation, disorientation, male gender, younger age, diagnosis of schizophrenia or personality disorder, involuntary admission, history of aggression, risk of elopement, poor insight, low income and the presence of male staff in the adult population [10–12]. Other studies have found history of aggression against adults, multiple prior psychiatric hospitalizations, female gender, lower psychosocial functioning, absent insight and involuntary hospitalization as risk factors for use of R&S among children and adolescents during psychiatric hospitalization [9, 13–15].

However, little data suggests any clinical benefit from restrictive measures, regarding efficiency, efficacy, or effectiveness [16]. The experiences of R&S are predominantly negative for young patients [17]. Further, these measures are known to affect both patients and staff adversely, and may lead to physical injuries, psychological trauma, and even death. Multiple evidence-based interventions to reduce the use of R&S have been developed [18].

According to the Mental Health Law (MHL) of China [19], two conditions must be met to justify the use of restraint in a psychiatric patient: the patient must have acted to disturb medical order and no available alternatives must be available. Studies reported a decrease in the use of restraints in adult psychiatric hospitals in China after MHL was approved [20, 21]. However, clinicians have differing interpretations of the law due to its vague language [22, 23]. Furthermore, there are no guidelines in China regarding the use of R&S in child and adolescent patients.

It is estimated that more than 40,000 child and adolescent patients are psychiatrically hospitalized every year in China [24]. There are no prior studies examining the use of R&S in this population. As a part of nation-wide survey, we collected clinical data pertaining to patients discharged from 41 tertiary psychiatric hospitals in China, which were main psychiatric hospitals in every province, and we specifically aimed to survey the use of R&S and examine associated factors in child and adolescent psychiatric inpatients in China.

Method

This study was a part of a large research project called the National Survey for the Evaluation of Psychiatric Hospital Performance, which gathers data from 41 tertiary psychiatric hospitals in 29 provinces in China [25]. These hospitals were under the jurisdiction of the Ministry of Health (now incorporated into the new National Health Commission) in each province. We also did not include hospitals within the jurisdiction of the Ministry of Public Security (Forensic Psychiatric Hospitals) and the Ministry of Social Welfare (Safety Net Hospitals) as their patient populations are different and they often follow different guidelines about staffing and resource allocations. The number of psychiatric inpatient beds in these hospitals ranged from 169 to 2141 (mean = 937.17, median = 800), and the number of child and adolescent beds was ranged from 0 to 120 (mean = 26.02, median = 25), 10 hospitals had no children/adolescent beds. Therefore youth inpatients are often in adult units in these hospitals which had no children/adolescents beds [26]. Briefly, 41 psychiatric hospitals from 29 provinces China were included in the study. Our data analysis included all patients under age 18 years old who had a psychiatric hospitalization and were discharged between March 19 and 31, 2019. Four patients were excluded from the analysis due to missing data or being discharge on the same day as admission. Finally, data pertaining to the hospitalization of 196

unique patients were analyzed in this study. These patients were discharged from 37 hospitals, while other 4 hospitals did not have any discharged youth patients during study period. The mean number of discharged patients from each hospital was 5.3 and median number was 5, ranging from 1 to 14.

Patients' demographic information and clinical features were collected by research staff using semi-structured interviews and discharge medical records. The retrieved data included age, sex, primary reasons for admission (multiple choices), primary diagnosis according to the International Classification of Diseases and Related Health Problems 10th revision (ICD-10), Global Assessment of Functioning (GAF) score on admission, length of stay, voluntary or involuntary status, history of prior psychiatric hospitalizations, use of R&S and history of aggressive behaviors, self-injury and suicide attempts during the hospitalization.

The Ethics Committee of Chaohu Hospital of Anhui Medical University (No. 201903-kyxm-02) and each participating hospitals approved this study.

Summary statistics were used to describe the data. Comparison of age, length of stay and GAF scores in various subgroups was conducted using Mann–Whitney U test as appropriate. A Chi-square test was used to compare categorical variables. Logistic regression was used to determine predictive factors for dichotomous category membership. The SPSS version 22.0 software (IBM Corp, Armonk, NY) was used.

All the tests were two-sided and statistical significance was defined as $p < 0.05$.

Results

Patients and Admission Characteristics

196 Patients under age 18 were discharged from psychiatric hospitals during the 2-week study period. The mean age was 15.28 ± 1.79 years (ranging from 6 to 17 years), and 56.6% (N = 111) of the patients were female. 136 Patients had no prior psychiatric hospitalizations. 63 Patients (32.1%) were hospitalized on an involuntary status. The most frequent primary reasons for admission were psychotic symptoms, depressive symptoms, manic symptoms, aggressive behavior, and self-injurious or suicidal behaviors. Table 1 shows a summary of the clinical data.

Prevalence of Restrictive Interventions

57/196 (29.1%) of patients in this study received either restraint or seclusion during their hospitalization. The rate of restraint was 28.6% (N = 56), and seclusion was 11.7% (N = 23) respectively. 22 Received both R&S.

The number of restraints for each patient ranged from 1 to 30, with a median of 2; the number of seclusion ranged from 1 to 16, with median of 1. A small group of patients received the majority of R&S interventions. 6 patients received more than half of the total restraints and 4 patients experienced more than half of the seclusions.

Table 1 Comparison of clinical features between young inpatients that experienced restrictive interventions (restraint or seclusion) and not

	Total	Yes (n = 57, 100%)	No (n = 139, 100%)	x^2/z	p
Age	15.28 ± 1.79	15.56 ± 1.57	15.17 ± 1.86	− 1.382	0.167
Sex					
Male	85 (43.4%)	28 (49.1%)	57 (41.0%)	1.084	0.298
Female	111 (56.6%)	29 (50.9%)	82 (59.0%)		
Involuntary Admission	63 (32.1%)	35 (61.4%)	28 (20.1%)	31.55	< 0.001**
First admission	136 (69.4%)	40 (70.2%)	96 (69.1%)	0.023	0.878
Primary reason of admission					
Psychotic symptoms	92 (46.9%)	31 (54.4%)	61 (43.9%)	1.790	0.181
Depressive symptoms	84 (43.3%)	15 (26.3%)	70 (50.4%)	9.515	0.002**
Mania symptoms	27 (13.8%)	17 (29.8%)	10 (7.2%)	17.429	< 0.001**
Aggressive behaviors	28 (14.3%)	17 (29.8%)	11 (7.9%)	15.849	< 0.001**
Self-injurious/suicidal behaviors	34 (17.3%)	10 (17.5%)	24 (17.3%)	0.002	0.963
Aggressive behaviors during hospitalization	62 (31.6%)	45 (78.9%)	17 (12.2%)	83.2	< 0.001**
Self-injurious/suicidal behaviors during hospitalization	24 (12.2%)	11 (19.3%)	13 (9.4%)	3.721	0.054
Mean length of stay (days)	32.53 ± 22.42	38.47 ± 25.37	30.09 ± 20.70	− 2.009	0.044*
GAF scores when admitted	47.67 ± 18.67	37.88 ± 17.99	51.69 ± 17.61	− 4.640	< 0.001**
Diagnosis of psychosis or bipolar disorder	90 (45.9%)	34 (59.6%)	56 (40.3%)	6.102	0.014*

Comparisons of Demographic and Clinical Factors Between Patients Who Received R&S and Those Who Did Not

As shown in Table 2, there were significant differences between patients who required R&S during the hospital stay and those who did not. Details please refer to the table. Briefly, R&S were more often utilized in patients who were admitted involuntarily, and presented with either manic symptoms or aggressive behavior as the primary reason for admission. Patients who received R&S had a significantly longer length of stay.

Factors Associated with R&S

A logistic regression was performed to examine factors associated with the use of R&S. The full model containing all predictors was statistically significant (omnibus $x^2 = 112.06$, $p < 0.001$). The model as whole explained between 43.5% (Cox and Snell R^2) and 62.2% (Nagelkerke R^2) of the variance, and correctly classified 89.3% of cases.

As shown in Table 2, aggressive behaviors during hospitalization was significantly associated with the use of R&S (OR = 21.277, $p < 0.001$) and three other factors were also significantly associated with the use of R&S, including manic symptoms as a reason for admission, involuntary admission and a lower GAF at admission (all $p < 0.01$).

Discussion

This is the first nation-wide study to examine the use of R&S in children and adolescents during psychiatric hospitalization in China. This representative national survey found a higher rate of R&S than what has previously been reported in the literature among any patient population in any geographical area.

Certain limitations to this study need to be acknowledged. First, data pertaining to the patient's prior history of trauma, neglect, abuse, intellectual disability, neurodevelopmental disability and parent custody were unavailable. Potentially relevant demographic data including family income and parental marital status were not collected. Second, details about the interventions including other interventions attempted prior to R&S, specific type of restraint use, duration of the restrictive measure, administration of medication, and the patients' perception of this experience were not available. Third, it is possible our findings may be specific to individual organizations and local culture. However, due to the very small sample size after breaking down for individual hospitals, we were unable to conduct meaningful analysis. Finally, data pertaining to the staff such as gender, education, work-related stress, level of training in reduction of R&S, and prior experience were not available.

The rate of R&S found in children and adolescent psychiatric hospitalizations in China is concerning given the lack of efficacy, many risks, and potential traumatic sequelae for both patients and staff [16]. The overall rate of R&S in this sample of child and adolescent patients is even higher than the rate that has been reported in adult patients in China [20, 21]. Further, the rate found in our sample is also much higher than the rate found in Western countries in recent studies, which ranges from 6.5 to 16.9% [27, 28].

There is consensus that the use of R&S in children and adolescents should be minimized, and the use of R&S among children and adolescents in Western countries has declined significantly over that past two decades [29, 30]. While rates above 20% were reported in Western samples prior to 2010, widespread efforts to reduce use of R&S have occurred during the past decade [15, 31, 32].

The elevated rate of R&S found in this study likely represents inappropriate use of R&S when either evidence-based de-escalation techniques or other less restrictive measures would suffice. However, it is possible that differences in the

Table 2 Associations of independent variables with restrictive measures using of youth inpatients

	B	SE	Wald	df	Odds ratio	95% CI for odds ratio	
						Lower	Upper
Primary reason of admission							
Depressive symptoms	0.826	0.604	1.872	1	2.283	0.700	7.463
Mania symptoms	1.505	0.682	4.876	1	4.505*	1.185	17.241
Aggressive behaviors	1.096	0.642	2.911	1	2.994	0.850	10.526
Involuntary admission	1.542	0.533	8.383	1	4.673**	1.645	13.333
GAF scores when admitted	0.031	0.013	5.492	1	1.032*	1.005	1.058
Length of stay (days)	− 0.006	0.01	0.389	1	0.994	0.975	1.013
Aggressive behaviors during hospitalization	3.06	0.499	37.664	1	21.277***	8.000	55.556
Diagnosis of psychosis or bipolar disorder	− 0.149	0.544	0.075	1	0.862	0.296	2.506

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$

acuity of patients who are psychiatrically hospitalized in China accounts for some elevation in rate of the use of R&S.

Factors associated with R&S in this study are consistent with findings of other studies, including those from Western countries. For example, involuntary admission and aggressive behavior were significantly associated with the use of R&S, consistent with the findings of other studies [8, 28, 32, 33]. As our previous study showed, the size of the population and units varied greatly from one area to another [26]. The proportion of involuntary admission can vary from one hospital to another, and many factors may affect this, as reported in our previous study [34]. All participating hospitals in this study accept involuntary psychiatric patients as well as voluntary ones. Whether patients are voluntary or not is often decided by their families and psychiatrists. Consistent with other studies [13, 28, 35], our study also found that the use of R&S was significantly associated with length of stay. Moreover, the diagnosis of schizophrenia, mania or bipolar disorder was associated with the use of R&S. These disorders might represent more severe impairment, poor insight requiring involuntary hospitalization and elevated risk of aggression [28].

Adequate, well-trained and specialized staff are critical to maintaining the safety of psychiatric hospitals [36]. The critical shortage of child mental health professionals in China may contribute to the strikingly high rates of R&S [37]. While many de-escalation strategies and other interventions have been developed to minimize the use of R&S in psychiatric hospitals, these measures have not been widely implemented in China [29, 38].

Summary

This representative national survey found a strikingly high rate of R&S use among children and adolescents during psychiatric hospitalizations in China. The use of R&S was significantly associated with aggressive behaviors, involuntary hospitalization, longer duration of hospitalization and more severe illness. Actions are urgently needed to minimize the use of highly restrictive measures with minimal efficacy and to ensure wellbeing and safety of both patients and staff. Staff must have training in de-escalation techniques and less restrictive measures. The development of clear guidelines and implementation of regulation and oversight to ensure appropriate indications and safe implementation of highly restrictive measures are critical.

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Author Contributions FG and FJ had full access to all the data in the study and took responsibility for the integrity of the data and the accuracy of the data analysis. Concept and design: FJ, HL and YT. Acquisition, analysis, or interpretation of data: FG, YT. Drafting of the manuscript: FG, HL and YT. Critical revision of the manuscript for important intellectual content: all authors. Statistical analysis: FG, FJ and Y-lT. Obtained funding: FJ and HL. Supervision: HL, YT.

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Compliance with Ethical Standards

Conflict of interest None declared.

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