

Effectiveness of enhanced post-restraint debriefing in reducing repeated physical restraint: a retrospective pilot study of psychiatric inpatient units in Hong Kong, China



Original article

Sui Lung Wong*, Pui Wong, Yun Yu Leung, Chun Hang Taiang

Kwai Chung Hospital, Hong Kong SAR, China

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Abstract: **Objective:** Physical restraint (PR) prevalence is notably higher in Asian psychiatric settings, and in Hong Kong, China; a recent study reported a rate of 0.43 episodes per patient admission. While “No Force First” philosophies and post-restraint debriefing are promoted to minimize PR’s detrimental effects, their implementation is often inconsistent and unstructured, lacking evidence-based frameworks. **Methods:** This retrospective observational pilot study evaluated an enhanced post-restraint debriefing (EPRD) framework, developed by psychiatric nurses and comprising 11 essential topics. Conducted over 3 months from 3 psychiatric units in Hong Kong, China. It included 112 patients who experienced PR due to aggression. The primary outcome was the prevalence of repeated PR within 14 d. Nurses could choose to use EPRD or conventional post-restraint debriefing (CPRD). Fidelity was measured using a checklist; sessions covering ≥ 8 topics were deemed valid EPRD. Data were analyzed using chi-square tests, *t*-tests, and effect sizes (Cohen’s *d*). **Results:** The repeated PR rate was significantly lower in the EPRD group ($n = 72$, 33.3%) compared with the CPRD group ($n = 40$, 55.0%) ($\chi^2 = 4.99$, $P = 0.026$). EPRD was associated with a 59% reduction in odds of repeated restraint (odds ratio [OR] = 0.41, 95% confidence intervals [CI]: 0.19–0.90), an absolute risk reduction (ARR) of 21.7%, and a number needed to treat (NNT) of 5. EPRD sessions were significantly more comprehensive, addressing a mean of 9.88 checklist items versus 4.33 in CPRD ($P < 0.001$, $d = 4.26$), without a significant increase in debriefing duration. **Conclusions:** The implementation of a structured EPRD framework was feasible and associated with a significant reduction in repeated PR incidents without adding time burdens. This pilot demonstrates that standardizing post-incident debriefing content is effective strategy for reducing coercion in psychiatric inpatient care. The findings strongly support the need for larger, prospective, and randomized controlled trials to confirm these results and further validate the EPRD framework across diverse settings.

Keywords: mental illness • physical restraint • post restraint debriefing • restraint • seclusion

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1. Introduction

Physical restraint (PR) is a coercive intervention used in psychiatric inpatient settings due to patients deemed as a last resort to manage aggressive patients in dangerous to self or others. Although some psychiatric

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*Corresponding author.

E-mail: wsl533@ha.org.hk (S.-L. Wong).

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hospitals report using zero PR, it remains an available last option with varying use rates across different settings, while aggression may not be entirely avoidable.¹ A recent review concluded the use of PR in different countries has identified that the pool prevalence rate of restraint is 14.4%, and the prevalence in Asian hospital appears to be higher than other regions.² In the local situation, Välimäki et al.³ studied 14 psychiatric in-patient wards of Hong Kong, China for 6 months and found that 1798 PR episodes occurred within 4170 inpatients, and concluded the prevalent rate as 0.43. While there is no universally accepted standard to categorize the prevalence of restraint use as high or low, there is a consensus to minimize its application in psychiatric settings.^{4,5} It is because PR is recognized for its multifaceted negative impacts such as destroying the therapeutic relationship,⁶ fostering patient resistance toward treatment,¹ and carrying risks of physical complications such as pressure sores⁷ and deep vein thrombosis.⁸

Post-PR debriefing is emerging as one of the effective post-PR managements in psychiatric settings to reduce the use of restraints,^{9,10} while also promoting mental health recovery and fostering a more ethical and holistic care environment.¹¹ Through debriefing, patients can gain insight into the factors that precipitated the need for PR, heightening their awareness of early warning signs and potential issues leading to restraint incidents.¹² Despite the recognized benefits of post-restraint interventions, the specific details of these interventions are frequently inadequately addressed, such as what content should be covered in a post-PR.⁹ This inconsistency has also been observed in local clinical settings, where psychiatric nurses commonly conduct debriefing sessions after restraint incidents, but the content may vary widely, lacking standardization and raising concerns about the effectiveness in reducing repeated restraints without prior retrospective study. At the same time, the greater action to reduce the use of PR for patient's aggression is warranted in local psychiatric wards.³ To address this gap and improve patient care, a 3-month pilot project was undertaken in a local psychiatric hospital to implement an Enhanced Post-Restraint Debriefing (EPRD) framework, targeting to reduce the episodes of repeated restraint due to aggression within 14 d in inpatient units. This framework, developed by experienced psychiatric nurses, outlines 11 essential topics recommended for discussion during debriefing sessions.

This study aims to evaluate the effect of EPRD on the prevalence of repeated restraint incidents due to patient aggression within 14 d among psychiatric inpatients. We hypothesize that patients who receive EPRD will have a measurable lower prevalence of repeated PR due to aggression within 14 d compared with those who receive conventional post-restraint debriefing (CPRD).

2. Methods

2.1. Study design, participants, and setting

This pilot project employed a retrospective observational design to evaluate the implementation of an EPRD framework. The study was conducted over a 3-month period (1 July 2023 to 30 September 2023) in 3 psychiatric inpatient units of a psychiatric hospital: a male Psychiatric Intensive Care Unit (PICU), a male Post Admission Care Unit (PACU), and a female Learning Disability Unit (LDU). Participants included all inpatients who experienced PR due to aggression and received debriefing during the pilot period. All participants had documented psychiatric diagnoses. Ethical approval for this study was granted by the Hospital Authority Central Institutional Review Board, with reference number IRB-2024-134.

2.2. EPRD and CPRD

The EPRD framework was developed by 3 experienced psychiatric frontline nurses based on an extensive literature review. It comprises 11 essential topics recommended for brief discussion during post-restraint debriefing sessions: patient-perceived triggers, aggression escalation, preventive measures for similar situations, feelings and experiences during restraint, safety and privacy concerns, disruption of fairness and dignity, mutual sharing of negative feelings, barriers and facilitators to recovery, measures to regain stability, accountability, and critical learning points. By contrast, the CPRD is non-framework driven. Its flow is not guided by a standardized framework but is instead dependent on the individual nurse's preference and therapeutic approach. Furthermore, unlike the EPRD, CPRD typically lacks mandatory documentation to record the process and fidelity, leading to a higher variability of practice.

2.3. EPRD implementation

The EPRD framework was developed by 3 experienced psychiatric frontline nurses based on an extensive literature review. Debriefing sessions following restraint were expected to be brief, typically completed within 10 min, and be offered within 48 hours. Nurses had the option to conduct conventional methods (CPRD) according to their usual practice or to adopt the EPRD framework. To ensure fidelity, nurses completed a checklist of the 11 topics after conducting debriefing, whether the use of CPRD or EPRD was reported. Only sessions covering at least 8 out of 11 topics were considered a valid implementation of EPRD.

2.4. Observation of repeated restraint

This retrospective observational study monitored PR episodes due to aggression among psychiatric inpatients. The day on which the initial restraint occurred was designated as Day 1. If a patient experienced multiple restraint episodes on the same day (Day 1), these were considered as repeated restraints even within that day. Any subsequent PR occurring within the following 13 d (up to Day 14 from the initial restraint) was also classified as a repeated PR. For each restraint episode, whether initial or repeated, the patient was observed for any further restraints occurring within the subsequent 13 d, up to Day 14 from the last PR, following that episode.

2.5. Data collection

Data were extracted from standardized restraint forms completed for each PR incident, which documented the reason for restraint and other relevant clinical information. Concurrently, nurses conducting debriefings using the EPRD framework completed the EPRD checklists. All restraint events occurring within the pilot period across the 3 units were collected and reviewed, with restraint reasons cross-checked against the corresponding EPRD checklist data.

2.6. Data analysis

All statistical analyses were performed using IBM SPSS Statistics version 28.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were used to summarize

participant demographics, psychiatric diagnoses, and aggression characteristics. Continuous variables are presented as means and standard deviations (SD), while categorical variables are expressed as frequencies and percentages.

The primary outcome measure was the occurrence of repeated PR within 14 d post-debriefing. To examine the differences in repeated restraint rates between the EPRD and CPRD groups, Pearson's chi-square test of independence was employed. The strength and precision of the association were quantified using odds ratios (OR) with 95% confidence intervals (CI). Additionally, absolute risk reduction (ARR), relative risk (RR), and the number needed to treat (NNT) were calculated to convey clinical significance.

For continuous outcome variables, such as debriefing duration, restraint time, time to repeated restraint, and the number of checklist items addressed, independent-samples *t*-tests compared group means. Prior to conducting *t*-tests, Levene's test assessed homogeneity of variances to determine whether equal variances could be assumed. When variances were unequal, the adjusted *t*-test results were reported. Effect sizes for group differences in continuous variables were reported using Cohen's *d*, calculated as the difference between group means divided by the pooled SD. Effect sizes were interpreted according to conventional benchmarks (small: *d* = 0.2, medium: *d* = 0.5, large: *d* = 0.8).¹³ This facilitated understanding of the practical significance of findings beyond *P*-values.¹³ The number of checklist items addressed was compared between groups using *t*-tests and effect sizes.

Items	Male (<i>n</i> = 89)	Female (<i>n</i> = 23)	Total
<i>Age, mean</i>	40.22 (SD = 13.99)	39.17 (SD = 14.21)	40.17 (SD = 13.73)
<i>Diagnosis</i>			
Schizophrenia spectrum disorder	54 (60.7%)	0	54 (48.2%)
Intellectual disability	15 (16.9%)	23 (100%)	38 (33.9%)
Bipolar disorder	7 (7.9%)	0	7 (6.3%)
Substance use disorders	4 (4.5%)	0	4 (3.6%)
Anxiety disorder	4 (4.5%)	0	4 (3.6%)
Obsessive-compulsive disorder	2 (2.2%)	0	2 (1.8%)
Other diagnoses	3 (3.4%)	0	3 (2.7%)
<i>Reason for restraint (aggression toward)</i>			
Co-inpatient	34 (38.2%)	6 (26.1%)	40 (35.7%)
Staff	30 (33.7%)	8 (34.8%)	38 (33.9%)
Property	9 (10.1%)	2 (8.7%)	11 (9.8%)
Mixed	16 (18.0%)	7 (30.4%)	23 (20.5%)

Note: SD, standard deviation.

Table 1. Demographic and clinical characteristics of subjects.

All tests were 2-tailed, with statistical significance set at $P < 0.05$. Assumptions of normality for continuous variables were assessed visually via histograms and quantitatively using Shapiro–Wilk tests; variables approximated normal distributions, supporting the use of parametric tests.

3. Result

During the pilot period, 125 psychiatric inpatients experienced PR due to aggression. The mean age of the total sample was 40.22 years ($SD = 13.99$), with 98 males (78.4%) and 27 females (21.6%). The majority of PR incidents occurred in the the PICU (82 cases, 65.6%), followed by the LDU (27 cases, 21.6%) and the PACU (16 cases, 12.8%). Of the total cases, 13 (10.4%) were excluded from the analysis due to clients being unable to engage in meaningful conversation within 24 h after restraint, primarily because of speech impairments or poor mental condition. This resulted in a final analytic sample of 112 patients, comprising 89 males (79.5%) and 23 females (20.5%), with a mean age of 40.17 years ($SD = 13.73$). Within the sample, the most common diagnoses were Schizophrenia Spectrum Disorder ($n = 54$, 48.2%) and Intellectual Disability ($n = 38$, 33.9%), followed by Bipolar Disorder ($n = 7$, 6.3%), Substance Use Disorders and Generalized Anxiety Disorder combined ($n = 4$, 3.6%), Obsessive-Compulsive Disorder ($n = 2$, 1.8%), and other diagnoses ($n = 3$, 2.7%). Regarding restraint reasons, aggression toward co-inpatients accounted for 35.7% ($n = 40$) of cases, while aggression toward staff and property represented 33.9% ($n = 38$) and 9.8% ($n = 11$), respectively. The remaining 20.5% ($n = 23$) involved aggression directed at mixed targets (Table 1).

There were 46 cases of repeated restraint within 14 d, with the mean time to repeated restraint being 1.80 d ($SD = 3.28$). Nearly 39.1% of repeated restraints occurred on the same day as the initial restraint (Day 1, $n = 18$), and 52% occurred within the first 3 d. The 75th percentile of repeated restraint timing fell between Days 6 and 7, with cumulative percentages of 73.9% and 76.1%, respectively. The average duration of each restraint episode was 125.63 min ($SD = 32.86$), ranging from 60 min to 240 min. Debriefing sessions lasted, on average, 10.19 min ($SD = 2.94$), with a range of 5–20 min.

In the comparison including EPRD ($n = 72$) and CPRD group ($n = 40$), the association between these groups and repeated restraint within 14 d was analyzed using a chi-square test, which revealed a significant relationship between debriefing type and repeated restraint occurrence, $\chi^2(1, n = 112) = 4.99$, $P = 0.026$. Specifically, 33.3% ($n = 24$) of patients in the EPRD

group experienced repeated PR, compared with 55.0% ($n = 22$) in the CPRD group. Patients receiving EPRD had significantly lower odds of repeated restraint than those receiving CPRD ($OR = 0.41$, 95% CI: 0.19–0.90), corresponding to a 59% reduction in odds.

To further illustrate the clinical impact, the ARR was 21.7%, and the RR was 0.61, indicating a 39% lower risk of repeated restraint in the EPRD group. The NNT was approximately 5, meaning that for every 5 patients treated with EPRD, one repeated restraint episode was prevented.

To analyze the continuous variables between groups, the EPRD group had a slightly longer mean debriefing time ($M = 10.40$, $SD = 2.55$ min) than the CPRD group ($M = 10.07$, $SD = 3.15$), but this difference was not statistically significant, $t(110) = -0.57$, $P = 0.571$, 95% CI: -1.48 to 0.82 . Similarly, total restraint duration was comparable between groups, with the EPRD group averaging 126.74 min ($SD = 31.99$) and the CPRD group 123.63 min ($SD = 34.70$), $t(110) = 0.48$, $P = 0.633$, 95% CI: -9.78 to 16.00 . The time interval between repeated restraints also did not differ significantly, with means of 1.60 d ($SD = 3.17$) for EPRD and 2.18 d ($SD = 3.49$) for CPRD, $t(110) = -0.89$, $P = 0.374$, 95% CI -1.86 , 0.71 . Notably, the EPRD group addressed significantly more checklist items during debriefing ($M = 9.88$, $SD = 1.17$) compared with the CPRD group ($M = 4.33$, $SD = 1.51$), $t(110) = 21.61$, $P < 0.001$, with a very large effect size (Cohen's $d = 4.26$). This indicates that EPRD sessions were substantially more comprehensive.

4. Discussion

This study demonstrated that patients who received EPRD experienced a significantly lower rate of repeated PR within 14 d compared with those receiving CPRD. Specifically, repeated PR occurred in 33.3% of EPRD patients versus 55.0% in the CPRD group, representing a 21.7% ARR and a 39% RR reduction. These findings align with prior qualitative research showing that psychiatric service users perceive debriefing as an opportunity to discuss their feelings, reduce stressfulness, and improve their mental condition following restraint.^{14,15} Furthermore, the reduction in repeated restraint could be explained by the dual role of debriefing. It functions not only as a therapeutic tool for patients but also as an experiential learning opportunity for staff. Debriefing allows nurses to reflect on their communication and de-escalation techniques, potentially enhancing their skills to prevent escalation in future episodes requiring restraint.^{16,17} This reciprocal benefit may improve everyday clinical practice by fostering a more proactive and less coercive approach to aggression management.¹⁸

The significantly greater number of checklist items addressed during EPRD sessions (mean 9.88 vs. 4.33 in CPRD) confirms that the intervention was delivered with greater fidelity and comprehensiveness. This difference reflects the distinct nature of EPRD as a structured, comprehensive approach rather than a routine or minimal debriefing based on individual practice. Moreover, the average duration of debriefing and restraint episodes did not differ significantly between groups, indicating that EPRD does not impose additional time burdens in clinical settings.

We identified that Jackson et al.¹¹ highlighted a common challenge in acute psychiatric settings: inconsistent implementation of debriefing, with only about 50% of restraint incidents followed by debriefing despite institutional promotion efforts. Although our approach was non-mandatory, the establishment of an EPRD framework included frontline staff and immediate post-session documentation, resulting in a 64.29% implementation rate across these 112 restraint episodes. We suggest that this represents a meaningful improvement in adherence and accountability, likely contributing to the observed reduction in repeated restraints.

Limitations

The sample was predominantly male (79.5%), with an imbalanced distribution of diagnoses, due in part to the inclusion of psychiatric units with their specific natures, limiting the generalizability of findings to female patients

and other settings outside this hospital. Additionally, while checklist adherence ensured coverage of core debriefing topics, the dynamic nature of patient condition and nurse–patient interaction meant that the depth and quality of discussions could not be fully standardized. Although sessions were expected to last approximately 10 min, variability in engagement was inevitable due to intrinsic natures of debriefing, and we could not guarantee uniform implementation of EPRD content.

5. Conclusions

Future prospective studies with larger and more diverse samples are recommended to confirm these results and clarify the mechanisms by which structured debriefing reduces repeated restraint for patients with aggression. Investigations into how debriefing impacts staff attitudes, communication skills, and day-to-day nursing management would further elucidate its role in restraint reduction and patient recovery.

Ethical approval

This study was approved by Hospital Authority Central Institutional Review Board (IRB Approval No.: IRB-2024-134).

Conflicts of interest

All contributing authors declare no conflicts of interest.

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