Effects of improved hospital architecture on coercive measures

Coercive measures, such as seclusion and physical or mechanical restraint – with or without medication – are widely used as a last resort in psychiatric practice to prevent serious harm to self or others. However, the effectiveness of these measures is empirically questionable (1). Further, patients perceive them as traumatic and they potentially exacerbate mental illness (2-4). Thus, extensive efforts have been made to reduce their application (5), for example by training staff in social problem solving (6), by placing patients with some specific diagnoses in specialized acute wards (7), or by organizing psychiatric emergency response teams (8). Besides interventions focusing on organizational procedures and personnel, we observed that substantial structural improvements of psychiatric facilities may help to prevent coercive measures.

In early 2011, a large German university psychiatric clinic was moved into a new building with substantially increased ward space (from about 200 sqm for 16-18 patients to 400 sqm for 17 patients), changed room settings (from mainly 2-4 bed rooms to only 2- and 1-bed rooms), improved sanitary arrangement (from 2 toilets/showers per ward to one for each room), more natural lighting (from small windows to almost picture windows), modern home electronics and large balconies.

Additional factors which may influence the application of coercive measures (8,9), such as the staff-to-patients ratio, guidelines for coercive measures, and the distribution of psychiatric diagnoses in the clinic, remained relatively constant. However, staff was slightly reduced after the move and a de-escalation training for the staff had been implemented since 2008.

We compared coercive measures from January 2005 to December 2010 (before relocation) with measures from April 2011 to June 2014 (after relocation) applying two-sample t-tests. A few outlying data points were omitted from the analysis using the 1.5 interquartile range which, however, only marginally affected the results. Data points were averaged per quarter (three months) and represented coercive measures per average occupied beds (varying between 97 and 175). The quarter in which the relocation took place was not considered.

The number and duration of mechanical restraints as well as coercive medication significantly dropped by 50-85% in the three and a half years following the relocation: the mean number of restrained patients per bed decreased from 0.069 to 0.035 ($t(35) = 5.534$; $p<0.001$; 50%), the mean number of days with restraints from 0.227 to 0.083 ($t(35) = 5.153$; $p<0.001$; 63%), the mean duration of restraints (in hours) from 2.156 to 1.039 ($t(35) = 2.973$; $p=0.005$; 52%), and the mean number of coercive medications from 0.043 to 0.006 ($t(35)=6.073$; $p<0.001$; 85%). Thus, the decreased use of mechanical restraints was not compensated by an increased use of coercive medication.

These data suggest that improvements in the structural environment potentially reduce coercive interventions. As the relocation in our observation represents a natural experiment, it certainly lacks the control of potentially confounding factors. However, we speculate that the architectural changes may influence coercive measures via mediators such as increased patients' wellbeing, improved staff-patient relationship, and more opportunities for patients to withdraw from stressful situations.

Thomas Dresler[1,2], Tim Rohe[1], Markus Weber[1], Thomas Strittmatter[3], Andreas J. Fallgatter[1,2,4]

[1]Department of Psychiatry and Psychotherapy, University of Tuebingen, Germany;
[2]LEAD Graduate School, University of Tuebingen, Germany;
[3]University Construction Authority, University of Tuebingen, Germany;
[4]CIN, Center of Integrative Neuroscience, Excellence Cluster, University of Tuebingen, Germany

Acknowledgements

The first two authors contributed equally to this work. T. Dresler was partly supported by the LEAD graduate school (GSC1028), a project of the Excellence Initiative of the German federal and state governments.

References

1. Nelstrop L, Chandler-Oatts J, Bingley W et al. A systematic review of the safety and effectiveness of restraint and seclusion as interventions for the short-term management of violence in adult psychiatric inpatient settings and emergency departments. Worldviews Evid Based Nurs 2006;3:8-18.
2. Cusack KJ, Frueh BC, Hiers T et al. Trauma within the psychiatric setting: a preliminary empirical report. Adm Policy Ment Health 2003;30:453-60.
3. Frueh BC, Knapp RG, Cusack KJ et al. Patients' reports of traumatic or harmful experiences within the psychiatric setting. Psychiatr Serv 2005;56:1123-33.
4. Meyer H, Taiminen T, Vuori T et al. Posttraumatic stress disorder symptoms related to psychosis and acute involuntary hospitalization in schizophrenic and delusional patients. J Nerv Ment Dis 1999;187:343-52.
5. Gaskin CJ, Elsom SJ, Happell B. Interventions for reducing the use of seclusion in psychiatric facilities: review of the literature. Br J Psychiatry 2007;191:298-303.

6. Martin A, Krieg H, Esposito F et al. Reduction of restraint and seclusion through collaborative problem solving: a five-year prospective inpatient study. Psychiatr Serv 2008;59:1406-12.
7. Steinert T, Eisele F, Goeser U et al. Successful interventions on an organisational level to reduce violence and coercive interventions in in-patients with adjustment disorders and personality disorders. Clin Pract Epidemiol Ment Health 2008;4:27.
8. Smith GM, Davis RH, Bixler EO et al. Pennsylvania state hospital system's seclusion and restraint reduction program. Psychiatr Serv 2005;56:1115-22.
9. Steinert MT, Martin V, Baur M et al. Diagnosis-related frequency of compulsory measures in 10 German psychiatric hospitals and correlates with hospital characteristics. Soc Psychiatry Psychiatr Epidemiol 2007;42:140-5.

DOI 10.1002/wps.20201