

Chapter 7.

The power of day-to-day motivational techniques and family participation in reducing seclusion: a comparison of two admission wards with and without a seclusion prevention protocol.

E.O. Noorthoorn ^a

W.A. Janssen ^a

J. Theunissen ^b

H. Hesta ^b

W. J. de Vries ^b

G.J.M. Hutschemeakers ^b

H.H.G.M Lendemeijer ^a

^a Kenniscentrum GGNet, Warnsveld, the Netherlands.

^b Pro Persona Mental Health Care, Wolfheze, The Netherlands.

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Abstract

Objective: The use of seclusion in psychiatric practice is a controversial issue in psychiatric practice in the Netherlands, as a number of recent studies show seclusion to be a predominant restrictive measure. In contrast to many surrounding countries Dutch legislation is arranged in such a way the protection of the physical integrity of the patient is more important than professional considerations with respect to the treatment of severe mental illness. The opening of a new admission ward provided the opportunity to study the effect of a number of preventive measures both before and after admission on the use of seclusion.

Methods: Two admission wards with the approximately the same staff compilation, the same admission criteria and a comparable catchments area were followed for 29 months. In the experimental ward a project was started with the aim to abandon seclusion in three years at the same time reducing all other forms of restrain, the comparable ward had care as usual.

Results: The data show a decrease of number and duration of seclusion in the experimental ward in comparison to the ward providing care as usual. This difference could be related to a number of patient and ward characteristics.

Keywords

seclusion patterns, staff attitude, patient characteristics, cohort study.

Introduction

In the Netherlands seclusion of psychiatric patients is a frequently applied intervention aimed at protection, control and containment of potentially dangerous, aggressive behaviour. Patients are locked up with or without their permission in specially designed rooms for care, nursing and treatment to reduce environmental stimuli and protect against self infliction of any harm (GIGV, 1990). Following the introduction of the Special Admissions act for Psychiatric Hospitals (Bijzondere Opnemingen in Psychiatrische Ziekenhuizen (BOPZ; (GIGV, 1990) governmental health care inspectorate data show an increase in the use of restraint measures, especially seclusion (Janssen & Lendemeijer, 2005), which may be related to a powerful curtailment of the 'bestwil criterion' allowing psychiatrist before 1994 to coerce treatment following their judgement in the interest of the patient (Landeweer, et al. 2007). In the opinion of many Dutch psychiatrists, nurses and policy makers secluding patients is an unethical intervention of which the therapeutic effect is disputable (Lendemeijer & Shortridge-Baggett. Moreover, no rationale for seclusion is yet substantiated through empirical research (Sailas & Wahlbeck, 2005). In line with this development from 2000 onwards a number of Dutch hospitals developed (Berghmans, et al. 2001) and tested a set of quality criteria aimed at prevention of seclusion and other restraint measures (Abma, et al. 2005).

The use of seclusion as a restrictive measure in psychiatry is associated mostly to aggression on behalf of the patient (Gutheil, 1978, Hodgkinson, 1985, Fisher, 1994). Friends or family members often have a high degree of expertise in the behaviour of the patient as how to deal with acting out and aggression despite often extreme conduct. Next to being ill, a patient also remains being husband, child neighbour or parent (de Jong, 1996, Wiersma, et al. 1988, Tolsdorf, 1986). Acting out or aggressive behaviour may be appreciated as failing coping with deranged mental processing within the context of a mental illness or a deranged personality (Monahan, 1992, Nijman, et al. 1999), but also may be seen as a reaction of the patient being hospitalized and confronted with a set of limitations (Morrison, 1990) or even aversive staff behaviour (Whittington & Wykes, 1996). Insight in such information may be very helpful for nurses in determining their conduct.

Over Europe seclusion incidence and endurance varies wildly, also due to important differences in the organisation of mental health care. Most of the European sources indicate an incidence of between 24 and 86 seclusion incidents per 1000 admissions and a duration between 0,24 and 3,7 days per 1000 patient days (Bowers, 2000). Some countries however apply seclusion sparsely or at least for not more than a day (Bowers, et al. 2005, 2007).

After an admission the patient has to deal with a number of often confusing situations within the context of a ward with other patients being as ill or more seriously ill as themselves. Especially in

involuntary admission nurses are confronted with aggression (Nijman, et al. 1995). Within this context nurses feel the need to contain risk (VanderNagel, et al. 2007). Bowers and colleagues (2006) identified that the ability of the staff to regulate their natural reactions in dealing with patients together with the application of effective rules and routines for ward life as successful means to reduce conflicts on the ward and consequently reduce the need for containment measures. Efforts to reduce restraint measures must be clearly prioritized as an core ward objective supplemented by leadership (Pollard, et al. 2007) embedded in repeated performance monitoring and feedback procedures Donat, 1998, Murphy & Bennington, 2005). A well-educated (Morrison & Lehane, 1995, Owen, et al, 1998) and trained staff (Fisher, 1994, Foster, et al. 1999, Mason & Alty, 1994) also proved to be related to a decrease in the development of aggressive behaviour in patients and therefore the frequency of seclusions. The well-educated nurses were: trained in recognizing and applying preventive measures when confronted with aggression; able to use self-defence techniques and aware of the impact restraint and seclusion had on patients as to being informed by family or social network of the patient (Abma, et al. 2005, Fisher, 1994, Mason & Alty, 1994).

After the opening of a new built ward (Siependaal ward) a number of these considerations were taken into account in developing experimental conditions. On the assumption that seclusion did more harm as being traumatic and the assumption that restrain in general reflected more the relation between staff and clients a project was started to abandon seclusion and diminish other forms of restrain in three years. The project was process evaluating build and supported by a project leader and a researcher to supply data to the staff of the experimental ward. The experimental ward had a number of interventions developed during the project in comparison to care as usual:

1. all personnel was selected on consent with the main goals of the ward, aimed at prevention of seclusion as restrictive measure
2. team cohesion was stimulated by frequent team meetings, which was necessary as the personnel was new to each other and needed to grow confidence in dealing with aggression
3. team training was aimed at prevention of aggression and at dealing with conflict and focused on restoring the relation with the patient.
4. individual job coaching was provided as a follow up of team training.
5. a proactive approach in detecting behaviour preceding aggression, by using information of the patient, the family and community nurses in developing means to deal with patient behaviour, which were described within a specified signalling plan.
6. clear boundaries and limitations with respect to acting out behaviour at admission were communicated

7. after an involuntary admission the dangerousness criteria as formulated within the home environment were re-evaluated within the context of the admission
8. during a first admission information was gathered to compile specified signalling plans, plans aimed at early detection of behaviour preceding aggression.
9. agreement with the patient on treatment and signalling plan was valued as an important means in early detection of behaviour preceding aggression
10. family participation was appreciated as a main component of treatment both in developing treatment goals as well as in describing specified signalling plans aimed at detection of behaviour preceding aggression.
11. all staff members had an important input in developing treatment planning as opposed to the care as usual ward where the medical discipline dominated the decision process.
12. finally, at regular intervals a researcher collaborating with the experimental ward gave feedback on development of the numbers of restraint measures to the team.

The experimental ward was located in a rural township with a population of approximately 240.000 inhabitants in the mid of the Netherlands. The control ward providing care as usual (Riethorst ward) had the same function as the experimental ward and was located 45 kilometres from the experimental ward in a different rural township with a comparable catchment area. Both wards had a non selective admission policy and the same staff patient ratio, with respect to various types of professionals. The experimental ward was equipped with the same number of seclusion rooms as the control ward. Treatment provided in the experimental ward was aimed at less and shorter seclusions and aimed at preventing the use of seclusion as a whole.

The main goal of this study was to explore the effects of different ward cultures on two wards on the use of seclusion. The following questions were addressed:

1. Does a different ward culture lead to
 - a. a difference in the number of seclusion incidents in an experimental ward as compared to a control ward?
 - b. shorter seclusion episodes in an experimental ward as compared to a control ward?
2. Does a the number of seclusion incidents and the length of seclusion episodes develop through time in the experimental ward as compared to the control ward?
3. Are patient characteristics, such as age, marital status, diagnosis and admission data related to the chance to be secluded?

Material and Methods

Setting.

The Siependaal ward had a capacity of 45 beds and a patient staff ratio of 0,79. The Riethorst ward had a capacity of 38 beds and a patient staff ratio of 0,82. Each department could rely on psychiatrist, a resident, a psychologist and a social worker. Both wards were equipped with two seclusion rooms. The nursing teams on both wards were staffed with 3 nurses in the day- and evening shift and 2 nurses in the nightshift. Data on the restraint measures were gathered on a day to day basis on a registration form filled in by nurses and checked on a weekly rounds on both wards. Data of the Dutch mental health inspectorate were used as a second check of this registration. Diagnosis were made in clinical routine procedures according to the DSM-IV criteria. Background data and information on admissions were gathered from the hospitals financial databases.

Outcome.

The study design is a prospective cohort study. The wards were first compared on the variables as age, sex, marital status, diagnosis, admission duration and readmission rate to investigate whether the admitted population was comparable. Diagnosis on axis 1 of the DSM-IV was categorized in five main groups with a hierarchy of severity in deranged behaviour (Sytema, 1994): 1st anxiety disorders, 2nd depressive disorders 3rd bipolar disorders, 4th psychotic disorders and finally 5th the dementias and other brain disorders.

The effect of the treatment experiment was investigated by comparing seclusion use between January 1st 2003 and June 1st 2005. Both seclusion incidence as expressed in the number of started seclusion per 1000 admissions (Bowers, 2000) as well as seclusion duration, as expressed in the number of seclusion days per 1000 patient days (Bowers, 2000) was calculated. Next to these main data, three seclusion patterns were identified and counted:

1. full seclusion,
2. partial seclusion
3. seclusion for nighttimes only

The application of isolation rooms, fixation, coerced medication and food and fluids was counted in the same way. Counting all restraint measures, such as isolation, fixation, coerced medication and food was done to investigate whether a reduction in all measures or only in the use of seclusion was achieved. In, theory other measures could substitute seclusion, not necessarily leading to a reduction of restraint measures as a whole. These data were related to the number of admissions in order to compare the data to international incidence and prevalence rates.

Analysis.

The use of the seclusion rooms and other restrain measures over time was compared by means of:

1. counts per quarterly tested by means of a chi-square on the frequencies;
2. the duration in days of different seclusion patterns (full, partial and night-time) tested by means of a stratified student test
3. a survival analysis using a stepwise Cox regression, in which the both the number of seclusion incidents as well as the duration of the seclusion measures compared between the wards as an outcome measure were imputed together with age, marital status, diagnostic category, time between admission and seclusion, admission duration and readmission rate as predictors.

The first two analysis were repeated controlling for marital status, main diagnostic category and admission duration to investigate whether specific patient categories had a different chance to undergo seclusion in both the experimental as well as the control ward. Of the Cox regression analysis the Hazard ratio (HR) and the Wald statistic and significance of the predictors will be presented. The HR represents the difference between the cumulative chance of an event – seclusion - as defined in two strata – the two wards. The Wald statistic represents the power of the relationship between predictor and outcome within the multivariate model.

Results

In the 29 months 1470 different patients were admitted to the wards, with a mean duration of 26 days per admission. 708 patients were admitted more than once, with a maximum up to 15 admissions a patient. In total, these admissions added up to 2533 admissions. The duration of the admissions were in the Siependaal ward was slightly shorter than in the Riethorst ward (24 days vs. 28 days, $p < 0,015$). The number of patients admitted more than once was somewhat more in the Siependaal ward than in the Riethorst ward. The bed occupation ratio proved to be in the Riethorst ward slightly less than in the Siependaal ward (96% as opposed to 98%). In general there were no important differences between the two wards, possibly either counfounding or modifying outcome.

An important difference between the two wards was the secluded patients in the experimental ward concerned almost exclusively readmitted patients (34 out of 39 incidents; 83%) while in the control ward the incidents occurred lesser often in readmitted patients (49 out of 130 incidents; 38%). Table 1 presents a comparison of ward and patient characteristics of both settings, showing the patients at the Siependaal ward were older, more often married, had more depressive disorders and less psychotic disorders than in the patients at the Riethorst ward. The use of isolation room, coerced medication and fixation occurred predominantly in the Riethorst ward. Because of the low frequency in the experimental ward these measures are left out of the comparative analyses.

Table 2 shows the development of the counts per quarterly of all, full partial and nighttimes seclusions over time. The results show a significant difference between the experimental and the control ward occurring after the second year and remaining significant in the third year. In the first year, patients had less chance to be secluded in the experimental ward as is shown in the ward incidence ratios. This chance improves in the second year, to enhance over the third half year. When the different patterns of seclusion are compared a difference in full and partial seclusion between the wards is observed. Full seclusion occurred more often in the control ward than in the experimental ward ($\chi^2=14,7$, $df= 21$, $p = 0,001$). However, the incidence of full seclusion diminishes over time especially in the last half year. Stratification of predictors to investigate effect modification showed marital status and female sex proved to protect for seclusion ($\chi^2= 21,7$ $df=3$, $p=0,000$). The axis 1 diagnoses of bipolar disorder and psychotic disorder occurred in 84 of the 109 seclusions, and in all of the seclusions occurring at the Siependaal ward ($\chi^2=44,7$, $df=7$, $p=0,000$). In only 21 of the 109 seclusions a personality disorder was registered, allowing no analysis.

Table 1. Comparison of background data between experimental ward and control ward

	Siependaal		Riethorst		
<i>Ward characteristics over study period</i>					
Number of admitted patients	768		702		
Number of admissions (range)	1392	1-12	1138	1-17	
Mean duration of the admissions (sd)*	24,3	25,9	27,6	42,2	
Patients with more than 1 admission*	264	34%	202	29%	
Seclusion incidents	39		130		
Patients					
secluded **	30	4%	79	11%	
in isolation room	1	0,1%	17	2%	
receiving coerced medication *	6	1%	37	5%	
fixation incidents	0	-	11	2%	
receiving coerced fluids or nurture	0	-	0	-	
<i>Patient characteristics</i>					
Male	332	43%	322	46%	
Female	435	57%	480	54%	
Mean age (sd)**	45,6	14,8	38,8	11,7	
Age range	17 - 86		16 - 77		
Age categories	< 25	7%	91	13%	
	25-34	17%	177	25%	
	35-44	26%	207	30%	
	45-54	24%	151	22%	
	> 55	26%	76	11%	
Marital status*					
	Unmarried*	30%	288	48%	
	Married*	45%	192	32%	
	divorced	20%	108	18%	
	widow(er)	6%	13	2%	
Diagnosis Axis 1*					
Dsm – IV	Discription				
V 62.x – V71.09	Psychosocial problem	21	3%	23	3%
300.xx	Anxiety disorder	119	16%	144	21%
296.xx	Depressive disorder**	212	28%	123	18%
296.x4	Bipolar 1 disorder	52	7%	69	10%
295.x; 297.x, 298.x	Psychotic disorder*	130	17%	153	22%
292.x, 293.x, 294.x	Dementia & brain disorder	21	3%	23	3%
799.99	Undetermined	213	28%	167	24%
Diagnosis Axis 2					
DSM – IV	Discription				
301.0, 1, 2	Cluster a personality disorder	3	0,4%	2	0,3%
301.5, 7, 81, 83	Cluster a personality disorder	31	4%	55	8%
301.4, 6, 82,	Cluster a personality disorder	6	1%	10	1%
301.9	Personality disorder NAO	27	4%	63	9%
799.99	Undetermined	129	17%	219	31%
999	No information	572	75%	353	50%

* significant difference, $p < 0.05$ ** significant difference, $p < 0.001$

Table 2. Number of seclusions over time counts per quarterly

Quarterly	Siependaal ward Experimental ward				Riethorst ward Control ward			
	Number seclusions	Seclusion types			Number seclusions	Seclusion types		
		full	Partial	Nighttime		full	Partial	Nighttime
1	4	2	1	1	7	2	4	1
2	7	4	3	0	19	7	10	2
3	11	3	7	1	11	5	5	1
4	2	1	0	1	8	5	3	0
1 st year incidence (^x /1000)	24 ^a 6,7	10	11	3	45 ^a 14,7	19	22	4
5	1	0	1	0	12	4	3	5
6	5	2	0	3	19	7	4	8
7	3	1	1	1	14	4	1	9
8	3	2	1	0	12	3	3	6
2 nd year incidence (^x /1000)	14 ^a 4,6	5	3	4	57 ^a 21,4	18	11	28
9	1	0	0	1	20	1	3	15
10	0	0	0	0	9	0	0	9
3 rd half year incidence (^x /1000)	1 ^a 0,7	0	0	0	29 ^a 26,1	2	3	24

^aComparison per year, chisq=14,5, p<0,000 .

In Table 3 we present the comparison in the duration in days over the seclusion incidents, stratified over the years. The last half year is left out of the comparison, as the Siependaal ward only had one seclusion in that time frame.

Important to notice is the finding the duration of the seclusions did not importantly differ between the wards as opposed to the number of seclusions. Once being secluded, the duration is not significantly different. The chance to be secluded is however far less when the experimental ward is compared to the control ward. Further analysis showed duration of admission was not related to the chance to be secluded on the experimental ward, while a longer admission was related to the chance to be secluded on the control ward. Analysis of these counts stratified to diagnostic category shows three main diagnostic categories to have some influence on the duration of the seclusion, a psychotic

Table 3. Comparison in duration of days over the seclusion incidents'

Year		Experimental ward	Control ward
2003	n patients=	24	45
	full	2,5	3,2
	partial	1,9	1,2
	nighttime	0,8	0,8
	total days	5,25	5,36
	total hours	89	95
	mean incident count	1,3 ^b	1,9 ^b
	prevalence (days/1000 admission days)	8 ^a	17 ^a
2004	n patients=	12	54
	full	2	3,8
	partial	0,5	0,5
	nighttime	0,7	0,5
	total days	3,7	4,8
	total hours	57 ^a	102 ^a
	mean incident count	1,2	1,4
	prevalence (days/1000 admission days)	3 ^a	19 ^a

^aSignificant difference, student t-test, $p < 0.001$ ^bSignificant difference, student t-test, $p < 0.05$

disorder, a bipolar 1 disorder ($\text{chisq}=44.9$, $\text{df}=7$, $p=0,000$) and a (borderline) personality disorder ($\text{chisq}=2.5$, $\text{df}=6$, $p=0,04$). These differences remain significant even in the small numbers of incidents in the experimental ward ($\text{chisq}=29.7$, $\text{df}=7$, $p=0.000$). The patients with a Bipolar disorder had a means stay of 6,8 days, with a psychotic disorder had a mean stay of 4,5 days and with a borderline personality disorder had a mean stay of 3,7 days.

Figure 1 and 2 as well as table 4 present the outcome of a cox regression analysis, which was done to investigate underlying variables predicting seclusion chance ad duration. Figure 1 presents the cumulative chance to be secluded as compared between the wards. Figure 2 shows the cumulative seclusion duration once being secluded. Table 4 presents the regression of patient characteristics on chance to be secluded in detail. The number of months the experimental ward existed was imputed as the time variable.

The Cox regression again confirms the findings of the counts per quarterly, showing a significant difference in number of seclusions ($p=0,000$; $n=169$ seclusions in $n=109$ patients) throughout time. In the Cox regression analysis chance to being secluded is measured form the start of

Figure 1

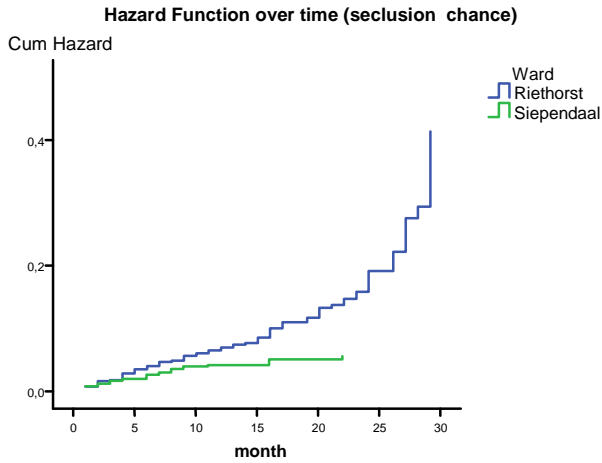


Figure 2

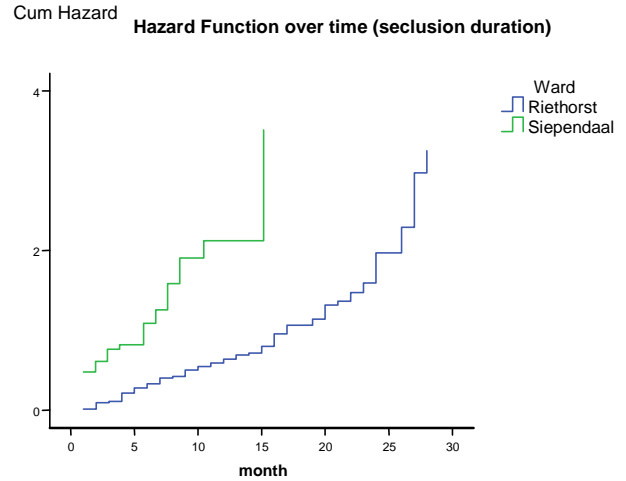


Table 4. Regression outcome

Strata	Patient count	Event count total	Event count 2003	Event count 2004		Censored Percent
				onwards	Censored	
Riethorst	79	130	70	60	702	11%
Siependaal	30	39	34	5	768	4%
Total	109	169	104	65	1470	7%

Predictors	B	SE	Wald	df	Sig.	Exp(B)
lft	-,260	,011	6,055	1	,014	,974
Marital status			5,842	3	,120	
Unmarried	-,765	,685	1,247	1	,264	,465
Married	-1,240	,652	3,622	1	,047	,289
Divorced	-,798	,658	1,472	1	,225	,450
Sex	,189	,208	,831	1	,362	1,208
Diagnosis			33,130	7	,000	
V 62.x- V71.09 Psychosocial problems	-,227	,560	,165	1	,685	,797
300.xx Anxiety disorder	-1,194	,455	6,879	1	,009	,303
296.xx Depressive disorder	-,811	,459	3,124	1	,077	,444
296.x4 Bipolar 1 disorder	,700	,336	4,346	1	,037	2,013
295.x, 297.x, 298.x Borderline personality disorder	,549	,282	3,785	1	,049	1,731
292.x, 293. x, 294.x Dementia & brain disorder	,472	,637	,550	1	,458	1,604
799.99 Undetermined	-,919	,759	1,466	1	,226	,399
Separation occurred in days after admission	,179	,014	162,551	1	,000	1,195
Admission duration	,036	,425	,470	1	,465	,326
Re-admission rate (per patient)	-,067	,378	,178	1	,785	,563

Overall score: Chsq=609.411, p=0.000; ward is used as strata variable

the experiment onwards. The proportion of included cases was 4% (30 secluded patients on 768 admissions) in the experimental ward and 11% (79 secluded patients on 702 admissions) in the control ward. The hazard ratio of being secluded in the control ward as compared to the experimental ward was 2,8 over the first year and 5,6 over the second year, indicating the downfall in the chance to be secluded in the experimental ward. Difference in seclusion chance proved to be predicted by age (younger age; Wald=6.0, p=0.01) marital status (being married; Wald=3.6, p=0.05) diagnosis (the bipolar 1 disorder, the psychotic disorder and inversely by anxiety disorders; Wald=33.1, p=0.000) and number of days after admission (the less days, the more chance, Wald 162,5, p=0.000) in both wards. Admission duration and readmission rate proved to have no predictive value for the difference in chance to be secluded.

Conclusion and discussion

The aim of the study was to investigate whether a ward that aimed at changing the culture of dealing with patients and between the staff could have an effect on reducing seclusion and other forms of restraint in comparison with care as usual in two comparable wards in the Netherlands. By learning on data and self-reflection the experimental ward developed different ways of dealing with each other as staff, with patients and their significant others.

The study showed a powerful difference between an experimental ward and a comparable control ward in the number of seclusion incidents. This difference already could be observed over the first year, but was more powerful after the first year. The results show further that the experimental ward was especially successful in preventing seclusion. Once a patient was secluded, the seclusion duration was only in the second and third year significantly shorter in the experimental ward than in the control ward. A careful observation of the development of the number of seclusions as well as the type of seclusion either being full, partial or only nighttimes showed partial and nighttimes seclusion episodes also increased over time in the control ward, suggesting some kind of carry over effect. When we look at characteristics of the secluded patients the data show seclusions occurred predominantly in male, unmarried patients with a diagnoses of a bipolar disorder, a psychotic disorder or a borderline personality disorder. These findings are in line with a recent German study suggesting the restraint measures occurred in same diagnostic categories (Martin, et al. 2005, 2007). Also, variables such as seclusion on day of admission and readmission determined both seclusion incidence and seclusion duration. In the Siependaal ward seclusions occurred mostly in readmitted patients.

An important limitation of this study is that the comparison only shows the combination of interventions provided in the experimental ward was successful. One of the lessons of the study is that some kind of description of the process of change by means of qualitative research could be helpful in developing treatment standards. Because of the level of data acquisition (few variables on many patients) the study provided no information on which components of ward culture were successful. This general level of data acquisition and analysis was necessary to allow an epidemiological estimation. Moreover, for a sound analysis between the predictors and chance of seclusion a full description of all admitted patients at both wards was necessary limiting the gathering of detailed information on an individual level. The continuous process of data acquisition may be expected to be related to an effect of underreport. Nurses had to assess data over a long period of time.

Both in the experimental ward, but maybe even stronger in the control ward the hectic of the daily practice of an admission ward may cut an extensive administration of data short. This effect may be expected to be less with respect to the seclusion data, but have some impact on the registration of the other restraint measures (Janssen, et al. 2005). Also, some extent of underreport may be observed in the diagnostic data, especially with respect to the personality disorders. Despite underreporting, a number of diagnoses remain significant predictors of seclusion, suggesting a powerful underlying relationship.

A main problem in the comparison of these data with comparable data in international studies is the lack of (international) standard (Martin, et al. 2007) as to how such data should be acquired, calculated and presented. The day to day registration provided understanding of various patterns of seclusion use. Consequently, information at such a detailed level could be compared to only a few recent studies in Europe and a number of outdated studies in the United States. Following Bowers (2000) we chose to relate incidence to number of admissions because a comparison with population data is dependent on the mental health system in the country. With this in mind, the incidence of seclusion use in both wards (varying between 0,7 and 26,1 per 1000 admissions) proved to be far lower than the incidence rates in previous Dutch studies, suggesting a seclusion incidence of between 10 and 25% in admission wards [36]. Other European studies (Martin, et al, 2005, 2007, Thompson, 1986, Kaltiala-Heino, et al. 2000, Demeestere, et al. 1995) show counts between 66 up to 177 per 1000 admissions per year. Only American (Way & Banks, 1990, Crenshaw & Francis, 1995), Australian (Cannon, et al. 2001) Greece and Italian data (Bowers, et al. 2005) show counts of less seclusions varying between 1,3 and 40 seclusions per 1000 admissions. The rural location of both wards may explain these relatively low counts. Another explanation could be that both units were competitive in their aim to reduce restraint.

The results in this study showed significantly less seclusions occurred in the experimental ward. Although hard data could not presented there was no indication that reducing seclusion gave a shift to other forms of restrain, such as coerced medication or fixation. This means that restrain is more a cultural phenomena than a treatment modality. Although the data give some suggestions about what cultural interventions are a risk diminishing factor to be at risk for seclusion or other forms of restrain more research will be needed.

References

1. Abma T., Widdershoven G. & Lendemeijer B. (2005). Restraint in Psychiatric Hospitals; the quality of patients freedomrestricted interventions [*Dwang en drang in de psychiatrie; kwaliteit van vrijheidsbeperkende interventies*]. Utrecht: Lemma.
2. Berghmans, R., Elfahmi, D., Goldsteen, M. & Widdershoven, G. (2001). *Quality of coercion in general psychiatry* [*Kwaliteit van dwang en drang in de psychiatrie*]. Maastricht: Instituut voor gezondheidsethiek Universiteit van Maastricht.
3. Bowers, L. (2000). The expression and comparison of ward incident rates. *Issues in Mental Health Nursing*. 21, 365–74.
4. Bowers, L., Douzenis, A., Galeazzi, G.M., Forghieri, M., Tsopelas, C., Simpson, A. & Allen T. (2005). Disruptive and dangerous behaviour by patients on acute psychiatric wards in three European centres. *Social Psychiatry psychiatric Epidemiology*. 40, 822–828.
5. Bowers, L., Brennan, G., Flood, C., Lipang, M. & Oladapo P. (2006). Preliminary outcomes of a trial to reduce conflict and containment on acute psychiatric wards; City nurses. *Journal of psychiatric and Mental health nursing*. 13, 165–172.
6. Bowers, L., van der Werf, B., Vokkolainen, A., Muir-Cochrane, E., Allan, T. & Alexander, J. (2007). International variation in containment measures for disturbed psychiatric inpatients: A comparative questionnaire survey. *International Journal of Nursing Studies*. 44, 356-357.
7. Cannon, M.E., Sprivulis, P. & McCarthy, J. (2001). Restraint practices in Australasian emergency departments. *Australian and New Zealand Journal of psychiatry*. 35, 464–467.
8. Crenshaw, W.B. & Francis, P.S. (1995). A national survey on seclusion and restraint in state psychiatric hospitals. *Psychiatric Services*, 46, 1026–1031.
9. Demeestere, M., Abraham, I. & Moens, G. (1995). Incidentie en derterminanten van dwangmaatregelen in de intramurale psychiatrische zorgverlening. *Acta Hospitalia*. 95, 39–53.
10. Donat, D.C. (1998). Impact of a mandatory behavioral consultation on seclusion/restraint utilization in a psychiatric hospital. *Journal of Behavioral Therapy & Experimental Psychiatry*. 29, 13–19.
11. Fisher, W.A. (1994). Restraint and Seclusion: A Review of the literature. *American Journal of Psychiatry*. 151, 1584-1591.
12. Foster, P.L., Cavness, C. & Phelps, M.A. (1999). Staff training decreases use of seclusion and restraint in an acute psychiatric hospital. *Archives of Psychiatric Nursing*. 13, 269–271.
13. GIGV. (1990). *Frame of reference: Emergency by patients in psychiatric hospitals* [*Referentiekader: Noodtoestanden bij patiënten in psychiatrische ziekenhuizen*]. Rijswijk. GIGV.

14. Gutheil, T.G. (1978). Observations on the theoretical bases for seclusion of the psychiatric inpatient. *American Journal of Psychiatry*. 135, 325-329.
15. Hodgkinson, P. (1985). The use of seclusion. *Journal of medicine, Science en the Law*. 25, 215–222.
16. Janssen, W.A, Hutschemaekers, G.H.M. & Lendemeijer, H.H.G.M. (2005). *Restraint use quantified [Dwang cijfermatig in beeld]* In: Abma, T, Widdershoven, G & Lendemijer, B. Restraint in Psychiatric Hospitals; the quality of patients freedomrestricted interventions [*Dwang en drang in de psychiatrie; kwaliteit van vrijheidsbeperkende interventies*]. Utrecht: Lemma; 2005.
17. Janssen, W. & Lendemijer, H.H.G.M. *Quantitative developments*. In: Landeweer E., Abma T., Berghmans R., Linden van der J., Janssen W., Dute J., Widdershoven G. (2007). 3rd *Evaluation of the Special Admissions act for Psychiatric Hospitals; third part: coerced treatment within hospital departments*. Den Haag. Ministerie van Volksgezondheid, Welzijn en Sport.
18. Jong, A. de (1996). Relationship between symptomatology and social disability. *Social psychiatry*, 21: 200-205.
19. Kaltiala-Heino, R., Korkeila, J., Tuohimäk, C., Tuori, T. & Lehtinen, V. (2000). Coercion and restrictions in psychiatric inpatient treatment. *European Psychiatry*. 15, 213–219.
20. Landeweer, E., Abma, T., Berghmans, R., Linden van der, J., Janssen, W., Dute, J. & Widdershoven G. (2007). 3rd *Evaluation of the Special Admissions act for Psychiatric Hospitals; third part: coerced treatment within hospital departments*. Den Haag. Ministerie van Volksgezondheid, Welzijn en Sport.
21. Lendemeijer, B. & Shortridge – Baggett, L. (1997). The use of seclusion in psychiatry: A literature review. *Scholarly Inquiry for Nursing Practice*. 11, 299-315.
22. Martin, V., Kuster, W., Baur, M., Bohnet, U., Hermelink, G., Knopp, M., Kronstorfer, R., Martinez-Funk, B., Roser, M., Voigtländer, W., Brandecker, R. & Steinert, T. (2005). Incidence of coercive measures as and indicator of quality in psychiatric hospitals: problems of data recording and processing, preliminary results of a benchmarking study [Die inzidenz von zwangsmassnahmen als qualitätsindikator in psychiatrischen kliniken: Probleme der datanerkennung und –verarbeitung und erste ergebniss]. *Psychiatrische Praxis*. 32, 1–9.
23. Martin, V., Bernhardsgrutter, R., Goebel, R. & Steinert, T. (2007). The use of mechanical restraint and seclusion in patients with schizophrenia: A comparison of the practice in Germany and Switzerland. *Clinical Practice and Epidemiology in Mental Health*. 3, 1-22.
24. Mason, T. & Alty, A. (1994). *Seclusion and mental health*. Chapman & Hall; London.
25. Monahan, J. (1992). Mental disorder and violent behavior: perceptions and evidence. *American Psychologist*. 47, 511–521.
26. Morrison, E.F. (1990). The tradition of toughness: A study of nonprofessional nursing care in psychiatric settings. *Journal of Nursing Scholarship*. 22, 32-38.

27. Morrison, P. & Lehane, M. (1995). Staffing levels and seclusion use. *Journal of Advanced Nursing*. 22, 1193-1202.
28. Murphy, T. & Bennington-Davis, M. (2005). *Restraint and seclusion*, HcPro, University of MA, Marblehead, USA.
29. Nijman, H.L.I., Allertz, W.F.F. & A Campo, J.L.M.G. (1995). Agressie van patienten: een onderzoek naar agressief gedrag van psychiatrische patienten op een gesloten afdeling. *Tijdschrift voor Psychiatrie*. 37, 329–342.
30. Nijman, H.L.I., A Campo, J.M.L.G., Ravelli, D.P. & Merckelbach, H. L.G.J. (1999). A tentative model of aggression on inpatient psychiatric wards. *Psychiatric Services*. 50, 832–834.
31. Owen, C., Tarantello, C., Jones., M. & Tennant, C. (1998). Violent and aggression in psychiatric units. *Psychiatric Services*. 49, 1452-1457.
32. Pollard, R., Yanasak, E.V., Rogers, S.A. & Tapp, A. (2007). Organizational and Unit Factors Contributing to reduction in the Use of Seclusion and Restraint. Procedures on an Acute Psychiatric Inpatient Unit. *Psychiatry Quarterly*. 78, 73–81.
33. Sailas, E. & Wahlbeck, K. (2005). Restraint and seclusion in psychiatric inpatient wards. *Current opinion in psychiatry*. 18, 555–559.
34. Sytema, S. (1994). *Patterns of Mental health care*. Methods & International comparative research. Van Denderen Groningen.
35. Thompson, P. (1986). The use of seclusion in psychiatric hospitals in the Newcastle area. *British Journal of Psychiatry*. 149, 471-474.
36. Tolsdorf, C.C. (1986). Social networks, support and coping. An exploratory study. *Family process*. 4: 407-417.
37. Van der Nagel, J., Van Gestel-Tuts, K., Hoekstra, T. & Noorthoorn, E.O. (2007). Seclusion: the perspective of nurses. *International Journal of Law and Psychiatry*. 32, 408-412.
38. Way, B.B. & Banks, S.M. (1990). Use of seclusion and restraint in public psychiatric hospitals: patient characteristics and facility effects. *Hospital and Community Psychiatry*. 41, 75-81.
39. Whittington, R & Wykes, T. (1996). Aversive stimulation by staff and violence by psychiatric patients. *British Journal of Clinical Psychology*. 35, 11-20.
40. Wiersma, D., de Jong, A. & Ormel, J. (1988). The Groningen disability schedule, development, relationship with the ICDH and psychometric properties. *International Journal of rehabilitation research*. 2, 213-224