



Reduction of assaultive behavior following anger treatment of forensic hospital patients with intellectual disabilities



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ABSTRACT

Anger is related to violence prior to hospitalization, during hospitalization, and after discharge. Meta-analyses have established treatment efficacy in reducing anger, but few studies have addressed whether reduced anger leads to lowered aggressive behavior. This study concerns individually-delivered anger treatment, specialized for offenders with intellectual disabilities, delivered twice weekly for 18 sessions to 50 forensic hospital patients. Assessments involved patient self-report of anger, staff ratings of anger and aggression, and case records of assaultive incidents. Physical assault data were obtained from records 12 months pre-treatment and 12 months post-treatment. Significant reductions in assaults following treatment were found by GEE analyses, controlling for age, gender, length of stay, IQ, and pre-hospital violence. Following treatment, physical attacks reduced by more than half, dropping from approximately 3.5 attacks per patient 6 months prior to treatment, versus approximately 1 attack per patient in the 6–12 month interval post-treatment. In hierarchical regressions, controlling for IQ, reduction in physical assaults was associated with pre-to post-treatment change in anger level. These findings buttress the efficacy of anger treatment for patients having histories of violence and have significance for patient mental health, hospital staff well-being, therapeutic milieu, hospital management, and service delivery costs.

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For detained hospital patients, both forensic and civil commitment, assaultive behavior is an important problem that affects patient care and staff well-being. Assaultive behavior by patients impairs the treatment milieu, results in increased restrictions and longer periods of detention, constitutes a risk for harm among staff, and has considerable costs for the institution in workers' compensation claims, sick leave and employee turnover. Anger has been found to be predictive of assaultive behavior by psychiatric patients, before, during, and after hospitalization. While there is considerable evidence that cognitive-behavioral anger treatment results in diminished levels of anger, there is little evidence for it reducing patient violence. The present study, which concerns forensic patients with intellectual disabilities, investigates whether assaultiveness in hospital is reduced following a specialized anger treatment (Taylor & Novaco, 2005) and whether that reduction is associated with therapeutic gains in assessed anger levels.

The issue of hospital patient assaultiveness was brought to the fore by Fottrell (1980) in a study at three British psychiatric hospitals, finding that 10% of the patients had been violent. That rate was soon eclipsed in research by Larkin, Murtagh, and Jones (1988) at one of the British Special Hospitals, where 36.6% of the patients were assaultive in a six-month interval. These and other seminal studies (e.g., Convit, Jaeger, Lin, Meisner, & Volavka; 1988; Palmstierna & Wistedt, 1989) drew research attention to the problem, the international scope of which is clear. For example, Cheung, Schietzer, Tuckwell, and Crowley (1996) found that the rate of physical assaults in an Australian hospital was 97.6 per 100 patients per year. For over 4000 California State Hospital patients, Novaco (1997) reported 14% had physically assaulted someone in hospital in a 30-day period. In Sweden, a survey of 731 nurses and 320 psychiatrists in all the health districts of Stockholm found that 57% had been victimized by violence in the previous 12 months (Soares, Lawako, & Nolan, 2000). Among the 1494 nurses in 27 hospitals in Japan studied by Ito, Eisen, Sederer, Yamada, and Tachimori (2001), 41.3% had experienced assault within the past year, and the risk of assault by patients was significantly related to their intentions to leave their job. With respect to the hospital in

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England involved in the present study, 47% of male patients had been physically assaultive and 34% had carried out two or more physical assaults post-admission (Novaco & Taylor, 2004).

The importance of anger for patient assaultiveness was established early in this field by Craig (1982) and by Kay, Wolkenfeld, and Murrill (1988), whose studies respectively found anger to be the strongest variable associated with physical aggression before hospital admission and during hospitalization. It is now been established in multiple studies with control variables that anger is predictive of physical aggression prior to hospital admission (Craig, 1982; McNeil, Eisner, & Binder, 2003; Novaco, 1994), during institutionalization (Doyle & Dolan, 2006a; Linaker & Busch-Iversen, 1995; Novaco, 1994; Novaco & Taylor, 2004; Wang & Diamond, 1999) and in the community after discharge (Doyle, Carter, Shaw, & Dolan, 2012; Doyle & Dolan, 2006b; Monahan et al., 2001; Sadeh & McNeil, 2013; Skeem et al., 2006; Swogger, Walsh, Homaifar, Caine, & Conner, 2012; Ullrich, Keers, & Coid, 2014). Among all adult patients in five California State Hospitals, 35% were rated by their primary clinician as someone who “gets angry and annoyed easily” (Novaco, 1997).

To the extent that anger is an antecedent variable in assaults by patients, it serves as a focus for intervention. Nine meta-analyses on the effectiveness of psychotherapy for anger have been published (Beck & Fernandez, 1998; Del Vecchio & O’Leary, 2004; DiGuseppe & Tafrate, 2003; Edmondson & Conger, 1996; Gansle, 2005; Ho, Carter, & Stephenson, 2011; Saini, 2009; Sukhodolsky, Kassinove, & Gorman, 2004; Tafrate, 1995), which overall have found medium to strong effect sizes, indicating that approximately 75% of those receiving anger treatment improved compared to controls. Cognitive behavioral therapy (CBT) approaches have greatest efficacy (DiGuseppe & Tafrate, 2007). Anger interventions with offender populations, however, have in some studies been less successful. For example, Howells and Day and their colleagues (e.g., Heseltine, Howells, & Day, 2010; Howells et al., 2005; Watt & Howells, 1999) have generally found low efficacy for their anger management programs, which were group-based interventions, largely delivered in prisons. They have highlighted anger problem complexity and insufficient intensity of treatment as potential sources of ineffectiveness and have found that anger declined when “treatment readiness” was present (for a review, Novaco, 2013).

Many anger intervention studies with non-forensic populations have not concerned patients with serious clinical problems, so violent behavior has not been within their purview. However, even in anger treatment research with forensic populations, including our own controlled studies discussed below, violence or assaultiveness has been missed in the outcome criteria. Because aggressive behavior is an important part of the anger construct (Novaco, 2000), this is a gap that needs to be addressed. Perhaps the only study to have assessed the effect of anger treatment on violent behavior against a treatment control condition is that of Lindsay et al. (2004) with intellectual disabilities clients in the community. In that study with 47 clients, at post-treatment follow-up assessment, 14% of those who had received anger treatment had been physically assaultive, compared to 45% in the treatment control condition.

Anger interventions for clients with intellectual disabilities

Aggressive behavior is a prominent problem among people with intellectual disabilities, particularly those in institutional settings (e.g., Harris, 1993; Hill & Bruininks, 1984; Sigafos, Elkins, Kerr, & Attwood, 1994; Smith, Branford, Collacott, Cooper, & McGrother, 1996). The prevalence of physical aggression in these studies is 35% or higher for persons in institutional settings. The all too common tendency, however, has been to attribute their emotional difficulties and challenging behavior to their disability, rather than to their emotional state or needs. In the past decade, various

implementations of cognitive-behavioral anger treatment have occurred with clients with intellectual disabilities, reviews of which are provided in Nicoll, Beail, and Saxon (2013), Taylor and Novaco (2013) and Willner, Jahoda, and Larkin (2013). Nevertheless, except for Lindsay et al. (2004) and Willner, Rose, et al. (2013), reduction in aggressive behavior has not been the anger treatment target in controlled studies. Our previous therapeutic intervention studies (Taylor, Novaco, Gillmer, Robertson, & Thorne, 2005; Taylor, Novaco, Gillmer, & Thorne, 2002; Taylor, Novaco, Guinan, & Street, 2004) have shown anger treatment gains compared to control conditions, but aggressive or violent behavior measures were not included. This has also been the case for the group-based anger treatment studies of Rose and his colleagues (e.g. Rose, Dodd, & Rose, 2008). Outside of studies with control treatment conditions, there have been several case series utilizing cognitive behavioral, mindfulness and behavioral skills training approaches reporting clinically significant reductions in aggressive behavior (Allen, Lindsay, MacCleod, & Smith, 2001; Lindsay, Allan, MacLeod, Smart, & Smith, 2003; Rose, 1996; Singh et al., 2008; Travis & Sturmey, 2013).

Finding no differences in anger between offenders and non-offenders, yet higher aggressive behavior for offenders, Nicoll and Beail (2013) questioned the validity of “the rationale that reduction in anger levels in offenders with intellectual disabilities would reduce aggression/offending behavior that would effectively place them in a non-offending population” (p. 469). Setting aside the complexities of the latter part of that statement, it is the case that evidence for aggression/violence reduction associated with anger treatment remains sparse. Lindsay et al. (2004) found that anger treatment, compared to a wait list control, was associated with significantly lower aggressive incidents in the community. Willner, Jahoda, et al. (2013) and Willner, Rose, et al. (2013), in a cluster randomized control trial of a group-based anger intervention for ID clients in day services, found that those in the treatment condition had significantly lower challenging behavior, but there were no differences on their aggressive behavior measure.

The link between patient anger and hospital assaultiveness was demonstrated by Novaco and Taylor (2004), as patient-rated anger significantly accounted for patient assaults, controlling for age, IQ, length of stay, prior violent offending, and personality variables. Those findings conjoined with anger treatment research results signals the need for an investigation of whether reductions in patient assaultive behavior follow from a therapeutic intervention focused on anger.

Study design

The present study is a clinical service evaluation of a specialized anger treatment protocol (Taylor & Novaco, 2005) conducted with intellectual disabilities patients in a forensic hospital. The study focus is on whether there are any reductions in patients’ assaultive behavior associated with individual-based CBT anger treatment, comparing assault incidents for 12-month pre-treatment and 12-month post-treatment time frames. Multiple covariates are used in our analyses. Further, we seek to determine whether the hypothesized subsequent reduction in assaultive behavior is associated with reductions in anger during the treatment phase.

Method

Setting

The study was conducted in the hospital forensic service of a National Health Service (NHS) Foundation Trust in England that provides specialist services to people with intellectual and

developmental disabilities. The hospital provides inpatient services on a local, regional and national basis to patients referred to its forensic services via statutory health and local authorities, the courts, and prison and probation services. The forensic service has seven units providing medium secure, low secure, and rehabilitation facilities for 136 patients, 18 (13%) of whom are women. All units are single sex.

Participants

We sought to include all patients who had completed an individually delivered anger treatment (Taylor & Novaco, 2005) and who remained in the hospital for 12 months following treatment. Patients who were discharged or transferred prior to the 12-month follow-up point could not be included, thus the participant set is missing some patients who have made significant treatment gains.¹ This left 50 patients (44 males and 6 females), all Caucasian, who participated in the study. The proportion of females (12%) is representative of the overall patient population. Average age of the participants was 30.0 years ($Mdn = 26.6$; $SD = 9.6$), average length of stay was 3.6 years ($Mdn = 2$; $SD = 3.2$), and average WAIS² Full Scale IQ was 68.6 ($Mdn = 68.0$; $SD = 6.7$). These characteristics are comparable to those reported in Novaco and Taylor (2004, 2008) in assessment studies with the hospital's male forensic population.

All study participants were formally detained under civil (s.3) or criminal sections (s.35/37/41/47/49) of the England and Wales Mental Health Act 1983. Under the Act people can be detained in hospital for treatment only when their intellectual (learning) disability is associated either 'abnormally aggressive behavior' or 'seriously irresponsible conduct' (Department of Health, 2008). Regarding their history of criminal behavior: 19 (38%) had previous convictions for violence and 23 (46%) had no convictions but a documented history of violent behavior; 20 (40%) had prior convictions for sexual offenses whilst 10 (20%) had a documented history sexual offending; 9 (18%) had convictions for fire-setting and 7 (14%) a documented history of setting fires; and 27 (54%) participants had convictions for other offenses. Table 1 provides a summary of participants' background characteristics.

In addition to mental impairment, the participants' hospital records noted co-morbid psychiatric diagnoses of psychosis (10%), major affective disorder (8%), and personality disorder (18%).

Participants were in-patients referred by their clinical teams for anger treatment on the basis of their pre-admission history of anger and aggression and their post-admission assessment and formulation of treatment needs. All participants consented to receive anger treatment and to have their clinical assessment data collated anonymously as aggregate group data for service evaluation purposes. The study was reviewed by the Trust's Research and NICE Implementation Manager and approved as a service evaluation project following which it was registered on the clinical governance database. The study was subject to clinical audit/service

¹ The research reported was a service evaluation. Patients were referred to the anger treatment program by their multidisciplinary clinical team, based on post-admission assessments and individual formulations of treatment needs. The program steering group then assessed each referral. Patients were included in the program, based on a number of criteria, including anger scores (informed by our research), length of time in hospital, and frequency/severity of aggressive behavior in the hospital setting. Thus, there were broad inclusion criteria concerning anger and aggression set by the clinical team. Service records show that, during the period that the 50 study participants received treatment, another 5 patients did not complete treatment, 4 due to therapists' decisions to discontinue (e.g. discharge opportunity), and one refused to complete treatment for reasons unconnected with the treatment.

² Patients' intellectual functioning was assessed using the WAIS-R and WAIS-II versions of the Wechsler Intelligence Scales.

Table 1

Demographic characteristics and cognitive functioning of study participants ($N = 50$).

	Mean (SD)	Median
Age	30.0 (9.6)	26.6
Length of stay in hospital (years)	3.6 (3.2)	2.5
WAIS Full Scale IQ	68.6 (6.7)	68.0
WORD basic reading age (years)	8.2 (2.5)	8.6
Hospital commitments		Number (%)
Mental Health Act 1983		
Treatment section (s.3)	14 (28%)	
Hospital order (s.37)	14 (28%)	
Hospital order with restriction (s.37/41)	14 (28%)	
Other sections (s. 35, 47, 49)	8 (16%)	
Previous convictions or documented history		
Violence	42 (84%)	
Sexual offenses	30 (60%)	
Fire-setting	16 (32%)	
Other	27 (54%)	

Note. Participants are 44 males and 6 females.

improvement monitoring by the Clinical Governance Department in line with the Trust's policy and procedures.

Anger treatment

Study participants received treatment guided by a treatment manual that was designed specifically for use with people with mild and borderline intellectual disabilities and utilizes the stress inoculation paradigm (Meichenbaum, 1985). The treatment is based on a detailed analysis and formulation of the person's anger dysregulation problems and was delivered over 18 sessions to individual participants by the same therapist. Six 'preparatory phase' sessions aimed at engaging and motivating treatment resistant participants was followed by a 12-session 'treatment phase', the core components of which are cognitive re-structuring, arousal reduction and behavioral skills training. A more detailed description of the treatment was reported in Taylor et al. (2005), and the full treatment protocol is provided in Taylor and Novaco (2005).

Treatment was provided by registered psychologists, clinical psychologists in training and senior assistant psychologists all of whom were trained in the delivery of the intervention and received close individual and peer group supervision to ensure treatment fidelity.

Study measures

Anger was assessed by three self-report instruments and one staff-rated measure, which are described below. Assaultive behavior was assessed by independent archival records of physical assaults, as described below for the pre-treatment and post-treatment intervals. The anger self-report measures were modified for use with developmentally disabled persons and were administered by structured interview, rather than as self-completed tests. Example modifications for these adapted self-report measures are given in Novaco and Taylor (2004), and the modified versions can be obtained from the authors.

Anger self-report

Spielberger State-Trait Anger Expression Inventory (STAXI). The STAXI (Spielberger, 1996) is composed of 44 items organized into scales that give measures of *State Anger*, *Trait Anger*, and *Anger Expression*. The *Anger Expression* scale has sub-scales of *Anger-In*,

Anger-Out, and *Anger Control*. The STAXI has had extensive development and validation with normal, forensic, and medical populations. Of these STAXI indices, because *Trait Anger* is a central anger disposition measure and *Anger Control* has treatment gain relevance, we use those in our analyses. We also use *Anger-Out* for its aggressive behavior criterion relevance.

Novaco Anger Scale (NAS). The NAS (Novaco, 1994, 2003) has *Cognitive*, *Arousal*, and *Behavioral* subscales. The sum of the 48 items contained in these subscales comprises the *NAS Total* score for anger disposition. An additional 12 items comprise the *Anger Regulation* scale. Developed and validated for use with mentally disordered and normal populations, it has been extensively validated with clinical and forensic samples, including its predictive association with the violent behavior of hospitalized patients (e.g., Doyle & Dolan, 2006a, 2006b; Doyle et al., 2012; McNeil et al., 2003; Monahan et al., 2001; Novaco & Taylor, 2004; Swogger et al., 2012; Ullrich et al., 2014). For our analyses, parallel to our selection of STAXI indices, we use *NAS Total*, *Anger Regulation*, and *NAS Behavioral* for our analyses.

Provocation Inventory (PI). The *PI* (Novaco, 2003) is an anger inventory developed to accompany the *NAS*; we use it as an additional anger disposition variable. Its 25 items provide an index of anger reaction intensity and generality for a range of potentially provocative situations. Independent validation has been demonstrated (e.g., Baker, Van Hasselt, & Sellers, 2008; Grisso, Davis, Vesselinov, Appelbaum, & Monahan, 2000; Gudjonsson & Sigurdsson, 2007; Lindqvist, Daderman, & Hellstrom, 2003; Mills, Kroner, & Forth, 1998). Its sensitivity to change in anger among the present patient population was demonstrated in Taylor et al. (2002).

For this patient population, these three modified self-report anger instruments (*STAXI*, *NAS*, and *PI*) have high convergent validity, are modestly but significantly related to staff-rated anger and aggressive behavior, and *NAS Total* is significantly associated with hospital assaults, controlling for background, aptitude, and personality variables (Novaco & Taylor, 2004, 2008).

All patient anger assessments were conducted independently by research assistant psychologists rather than by the therapists themselves.

Staff-rated anger

Ward Anger Rating Scale (WARS). The *WARS* (Novaco, 1994) is a two-part scale completed by a member of ward staff who knows the patient well and has observed the patient's behavior during the previous week. Developed in conjunction with the original *NAS* validation testing, it is designed for ease of recording in busy clinical settings. Its *Part B* consists of 7 "anger attributes" items that are summed to produce a staff-rated anger index. We use this index as it provides a mode of anger assessment beyond patient self-report.

The *WARS* anger attribute index has been shown to have high alpha and inter-rater reliability and good concurrent validity in studies involving mentally disordered offenders in forensic hospitals, both high security (Novaco & Renwick, 2002) and medium security facilities (Doyle & Dolan, 2006a) and with older adult psychiatric inpatients (Taylor, DuQueno, & Novaco, 2004). Doyle and Dolan (2006a) found the *WARS* to have predictive validity in prospective analyses of physical assaults in hospital, controlling for age, gender, length of stay, and major mental disorder. It has established reliability and validity with the present patient population (Novaco & Taylor, 2004, 2008) and other forensic patients (Vitacco et al., 2009).

Hospital physical assaults. Aggressive behavior data were independently collected by assistant psychologists from hospital case note incident records using a pro forma and operationally defined categories of behavior. Physically aggressive behavior was defined as hitting, punching, kicking, or otherwise lashing out that was aimed at harming someone. For ease of reference in this report, physically aggressive behavior is labeled *Physical Assaults* hereafter. None of the assistants collecting the incident records assault data had direct contact with the patients or with the direct care staff supporting them.

Our previous research established that 47% of the hospital's male patient population is physically assaultive in the hospital post-admission; 34% had carried out two or more assaults, and 24% engaged in three or more assaults. That prevalence of assaultiveness is consistent with rates found by other investigators for institutionalized people with developmental disabilities (Novaco & Taylor, 2004, 2008). As we have done previously, for the linear regression analyses, a log 10 transformation was performed to reduce skew in the assault data.

Procedure

Details on the assessment procedure for the measures of anger, aggression, and assaultive behavior are given in Novaco and Taylor (2004, 2008) and on the anger treatment procedure and assessment in conjunction with it in Taylor et al. (2005). Regarding the anger measures used in the present study, assessments were administered 2–3 weeks pre- and post-treatment.

Statistical analyses

Given that the physical assaults data are repeated measures and are positively skewed, as there are many counts of zero, we used Generalized Estimating Equations (GEE, Hardin & Hilbe, 2003; Liang & Zeger, 1986) with a log link function for a negative binomial distribution to analyze the change in assaults associated with treatment. GEE is an extension of linear regression with a correction for the dependency of individual observations – i.e., the autoregression in repeated measures. The analyses were run using an exchangeable correlation matrix. We principally analyzed for differences in assaults from the 12-month pre-treatment interval to the 12-month post-treatment interval, controlling for gender, age, length of stay in hospital, *WAIS Full Scale IQ*, and whether hospital admission derived from a violence offense. Seeking to more sharply identify the time interval in which significant change in assaultiveness was observed, we further partitioned the assault counts into 6-month blocks, before and after treatment. For that analysis, we dummy coded the last 6-month block (i.e., 7–12 months post-treatment) as the reference group and tested it against each of the other three 6-months blocks.

Beyond testing for reduction in assaults following treatment, our assumptive framework is that reductions in assaultive behavior are a function of treatment related reductions in anger. We therefore conducted regressions on change in assaults from the 12-month pre-treatment to the 12-month post-treatment intervals, testing for whether that change was associated with change in anger from pre-treatment to post-treatment. Each of the *STAXI*, *NAS*, *PI*, and *WARS* indices were used as test variables, assessing anger-level change. These regressions were conducted hierarchically with *IQ* as a covariate, as it was the only one of our background control variables that was significantly associated with reduction in assaults.

Results

Physical assaults overview

During the 12-month pretreatment interval, there were a total of 319 *Physical Assaults* by the participants. For the 50 patients, 14 (28%) had no assaults, 36 (72%) had one or more assaults, and 24 (48%) had two or more assaults. In the 12-month post-treatment interval, there were a total of 153 *Physical Assaults*, with 25 (50%) of the patients having no assaults, 25 (50%) engaging in one or more assaults, and 13 (26%) with two or more assaults. Of the 24 patients with two or more assaults in the 12-month pre-treatment interval, 22 (91.7%) of them decreased in the number of assaults in the 12-month post-treatment interval.

There were significant gender differences in assaults (log 10 transformed) in the 12-month pre-treatment interval, $t(5.41) = 2.84, p = .033$, as females ($M = 1.18, SD = .66$) were higher in assaults than were males ($M = .40, SD = .36$). There were no significant differences by gender during the 12-month post-treatment interval. When the assessment intervals were partitioned into 6-month blocks, there were no significant gender differences in assaults for any of the four 6-month intervals.

The assault data are in Fig. 1, illustrating the mean number of assaults in the 6-month intervals. The means for the intervals are: 12–7 months pre-treatment = 2.56; 6–0 months pre-treatment = 3.82; 0–6 months post-treatment = 1.86; 7–12 months post-treatment = 1.20.

Change in physical assaults following anger treatment

Taking the assault count as a dichotomous (0,1) variable (i.e. no assaults or any assaults) and comparing that rate before treatment versus after treatment, the odds ratio is 2.571 (95% confidence interval, 1.122–5.896), $z = 2.231, p = .026$. The odds of a patient being “assaultive” declined significantly after anger treatment, being 2.57 times higher before treatment.

The GEE analysis of physical assaults is reported in Table 2, which has two sections. In the top section, the “pre-post interval” parameter models the change in assaults in the 12 months following treatment in contrast to the 12 months prior to treatment, with gender, length of stay, age, IQ, and violent offense

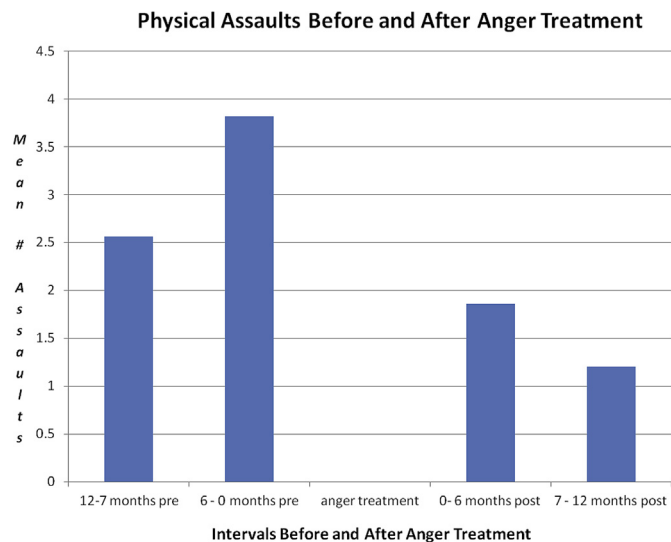


Fig. 1. The assaults data are physical incidents recorded in patients' case notes. $N = 50$. Physically aggressive behavior was defined as hitting, punching, kicking, or otherwise lashing out aimed at harming someone.

Table 2

Generalized estimating equations analysis of physical assaults, testing pre-treatment to post-treatment differences.

Predictors	B	SE	Wald chi-sq	p	95% CI	
					Low	High
Gender	2.248	.399	31.77	<.001	1.466	3.029
Length of stay	.092	.047	3.84	.050	-.000	.184
Age	-.080	.022	13.62	<.001	-.122	-.037
WAIS-R Full Scale	-.046	.017	7.20	.007	-.080	-.013
Violent offense	.448	.465	.92	ns	-.463	1.359
Pre-post interval	-.613	.262	5.48	.019	-1.126	-.099
Gender	2.237	.401	31.12	<.001	1.451	3.022
Length of stay	.094	.046	4.12	.042	-.003	.185
Age	-.080	.021	13.78	<.001	-.122	-.038
WAIS-R Full Scale	-.049	.017	7.92	.005	-.083	-.015
Violent offense	.429	.462	.86	ns	-.476	1.333
Time 1 (12–7 months pre)	.617	.273	5.10	.024	.082	1.152
Time 2 (6–0 months pre)	.913	.345	6.97	.008	.235	1.591
Time 3 (0–6 months post)	.303	.204	2.20	.138	-.098	.704

Note. The criterion is physical assaults over time. The “pre-post interval” parameter models change in assaults, contrasting 12-month intervals before and after anger treatment. The “Time” 1, 2, and 3 variables are 6-month intervals are dummy-coded variables contrasted with Time 4 (7–12 months post-treatment) as the reference group. $N = 50$.

history being controlled. Among the covariates, gender, age, and IQ are significant, and length of stay is marginal ($p = .05$). The pre-post interval parameter test is significant ($p = .019$). Assaults decline following anger treatment, controlling for the covariates.

In the bottom section of Table 2, the assault incidents are partitioned into 6-month intervals, with the 7–12 month post-treatment interval (time 4) being the reference group, against which the other 6-month intervals were dummy coded. The results indicate that assaults in both pre-treatment intervals were significantly higher than in the 7–12 month post-treatment interval, but that the two post-treatment intervals did not differ significantly from each other. To test whether the decline in assaults that occurred in the 0–6 month post-treatment interval (time 3) were significantly different from either of the pre-treatment intervals, the analysis with the same covariates was then run with the 0–6 months post-treatment interval as the reference group. The results were that the time 3 contrast with the 0–6 months pre-treatment interval (time 2) was marginal, $B = .610, SE = .313, Wald Chi-Square = 3.81, p = .051$, but no time interval tests were significant when contrasted against time 3. Thus, the significant decline in assaults primarily occurred in the 7–12 month post-treatment interval.

Physical assault reduction associated with anger treatment gains

The results of the hierarchical linear regressions performed on the change in physical assaults from pre-treatment to post-treatment (log 10 transformed) are presented in Table 3, testing for whether that change was associated with reductions in anger from pre-treatment to post-treatment. We use NAS Total as the primary variable, based on our previous finding that it is the strongest anger predictor of assaultiveness (Novaco & Taylor, 2004). Among the control variables, only WAIS Full Scale IQ was significantly related to the change in assaults, so it was the only covariate used in the regressions, which alternatively tested the self-report and staff-rated anger measures. As can be seen in Table 3, anger score reductions on NAS Total were significantly related to the change in assaults, and account for 15.8% of the variance in physical assault reduction, after IQ is controlled.

Table 4 then presents the results of that same analysis, alternatively using STAXI Trait Anger, STAXI Anger Control, NAS Anger Regulation, Provocation Inventory, and WARS staff-rated anger as

Table 3
Reduction in physical assaults as associated with treatment-related anger (NAS) change.

Predictors	B	SE B	β	t	p	R ² Δ
<i>Step 1</i>						
WAIS Full Scale IQ	-.019	.007	-.341	2.52	.015	.117
<i>Step 2</i>						
WAIS Full Scale IQ	-.021	.007	-.390	3.12	.003	
Δ NAS Total	.010	.003	.400	3.20	.002	.158

Note. The dependent variable is the number of physical assaults in the 12-month interval prior to treatment minus the number of physical assaults in the 12-month interval following treatment, the product of which is a reduction in physical assaults. The analysis, which controls for WAIS Full Scale IQ, tests whether that reduction in assaults is associated with treatment-related reduction in anger, indexed by the Novaco Anger Scale (NAS) Total Score. The change Δ NAS Total variable is the pre-treatment score minus the post-treatment score. For the final model, adjusted $R^2 = .243$, $F(2,47) = 8.86$, $p = .001$, $N = 50$.

test variables. NAS Anger Regulation and WARS staff-rated anger were significantly related to the change in assaults. The tests approach significance for STAXI Trait Anger and for the Provocation Inventory. STAXI Anger Control is not significant. The R^2 change coefficients for the respective test variables are given in the table.

Because of their criterion-oriented relevance, the STAXI Anger-Out subscale and NAS Behavioral subscale were also tested, again controlling for IQ. The results for both subscales are significant: for STAXI Anger-Out, $B = .407$, $t = 3.27$, $p = .002$, $\Delta R^2 = .164$; for NAS Behavioral, $B = .532$, $t = 4.58$, $p < .001$, $\Delta R^2 = .273$. Thus, treatment gains on both of these externalizing dimensions of anger were strongly associated with reductions in assaults.

Discussion

Hospital patient violence is a prevalent problem, recognized internationally, with costly effects on treatment staff and on the quality of patient care (e.g., Anderson & West, 2011; Arnetz & Arnetz, 2001; Lehmann, McCormick, & Kizer, 1999). Aggressive challenging behavior by clients with intellectual disabilities is commonly treated with antipsychotic drugs, despite the absence of an adequate evidence base with this clinical population (e.g.,

Tsiouris, 2010; Tyrer et al., 2008). In six studies on the prevalence of physically assaultive behavior among people with intellectual disabilities who are institutionalized, the post-admission rates range from 37% to 47% (cf. Taylor & Novaco, 2013). Staff working in intellectual disability services may have many times higher risk for patient-inflicted injury than staff in general psychiatric services, as found by Kiely and Pankhurst (1998) and by Vanderslott (1998) in NHS Trust hospitals in the United Kingdom.

The progressive dissemination of cognitive-behavioral anger treatment over the past few decades has been noteworthy, particularly as it has been applied to diverse client populations in both hospital and community settings, including recent research with combat veterans (Shea, Lambert, & Reddy, 2013). It has been in the vanguard of the development of psychotherapeutic approaches to clients with intellectual disabilities, but there has been relatively little focus on violent behavior as an outcome criterion. Given the now substantial body of research that has found anger to associated with violent behavior by psychiatric patients (before during, and after hospitalization), including with the current study population, we sought to determine whether patient assaultiveness declined in conjunction with anger treatment.

The results confirmed that physical assault incidents in the 12-month period following treatment compared to the 12-months prior to treatment declined significantly, controlling for age, gender, length of stay, IQ, and violent offense history. The future testing of the time intervals partitioned into four 6-month blocks found that the major decline in assaults occurred in the 7–12 month (time 4) post-treatment interval, which differed significantly from each of the pre-treatment 6-month intervals. The size of the sample may have limited our ability to detect a significant drop in assaults for the 0–6 month (time 3) post-treatment interval, as that test was marginal ($p = .051$) against time 2. It is certainly encouraging that as time progressed following the completion of treatment, assaults continued to decline.

Importantly, the reduction in assaults was associated with measured reduction in anger over the course of treatment, indexed by multiple anger psychometric scales with validated use for this patient population. Although the findings for STAXI Trait Anger and for the Provocation Inventory were marginal, significant results were obtained for NAS Total, which our previous research found to be the most significant predictor of the number of times a patient was assaultive in hospital. Correspondingly, significant results occurred for STAXI Anger Out and for NAS Behavioral, which are the subscales of their parent instruments that are most relevant to violent behavior. Treatment gains in self-reported control of anger were also associated with reduction in assaults, as indexed by the NAS Regulation scale, but the test on STAXI Anger Control was not significant. Importantly, reduction in patient anger over the course of treatment as rated by staff in their ward observations was also significantly associated with the decline in assaults from pre-treatment to post-treatment. Overall, the results provide support for the rationale that anger treatment – here implemented in our case-formulated, individualized CBT format (Taylor & Novaco, 2005) – has clinical value in reducing patient assaultiveness. The results serve to assuage concerns raised about anger treatment not being efficacious with violent offender populations in general (cf., Gilbert & Daffern, 2010; Novaco, 2013), and those with ID (Nicoll & Beail, 2013). It should be noted that our treatment approach varies substantially from the various group-based anger management approaches that are used in prison-based programs.

The main limitations of the present study are the absence of a control group and the sample size of 50 patients. The study was conducted as a clinical service evaluation to answer the question about patient assaultiveness as a treatment gain, which has not previously been addressed. Thus, the study was not designed with a

Table 4
Reduction in physical assaults as associated with other treatment-related anger indices.

Anger Δ predictors	B	SE B	β	t	p	R ² Δ
<i>Step 1</i>						
WAIS Full Scale IQ	-.019	.007	-.341	2.52	.015	.117
<i>Step 2</i>						
Δ STAXI Trait Anger	.011	.006	.238	1.79	.079	.057
Δ Provocation Inventory	.006	.003	.247	1.87	.068	.061
Δ STAXI Anger Control	-.011	.009	-.183	1.35	.183	.033
Δ NAS Anger Regulation	-.023	.008	-.354	2.78	.008	.125
Δ WARS Anger	.021	.008	.390	2.49	.018	.133

Note. $N = 50$. The results pertain to alternative measures of treatment-related anger change Δ indices, tested as predictors of reduction in physical assaults (see Table 3 Note). The WAIS Full Scale IQ coefficients for Step 2 are not given in the table for simplicity, as the specific values vary with the particular anger Δ predictor, which were each tested in separate regressions. The Ward Anger Rating Scale (WARS) is a 7-item staff-rated measure. The other anger measures are self-report psychometric scales. The Spielberger State-Trait Anger Expression Inventory (STAXI) Trait Anger subscale and the (Novaco) Provocation Inventory are measures of anger disposition. The STAXI Anger Control subscale and the Novaco Anger Scale (NAS) Anger Regulation scale are measures of anger control. For the two significant Anger Δ predictors, the NAS Regulation final model, adjusted $R^2 = .209$, $F(2,47) = 7.47$, $p = .002$. The WARS Anger final model, adjusted $R^2 = .248$, $F(2,47) = 6.78$, $p = .003$.

comparison control. The sample size was limited by the 12-month pre- and post-treatment interval requirements for the assaultive behavior counts, as some patients who had received anger treatment were discharged from the hospital during the 12-month post-treatment interval. Plausibly, though, the absence of those patients from the sample is a bias against our hypothesis of post-treatment assault reduction. Given those limitations, the study is buttressed by its use of strongly validated anger psychometric measures and staff-rated anger, by the incorporation of multiple covariates in our analyses, by the independence of the assessment data collection, and by the layered analyses that were conducted. No previous study of anger treatment or “anger management” has systematically examined institutional assaultive behavior as a criterion.

Anger eruptions frequently occur within mental health services. About half of all violent incidents in mental health settings are directly preceded by aversive stimulation of some sort (Whittington & Richter, 2005), to which patients react angrily, particularly those with a high anger disposition. The complex interactions between anger propensity, impaired intellectual functioning, acute or chronic mental illness, and the restrictive environments of hospital wards present major challenges for clinical staff. Friction is heightened when coercion or request denial is involved and when patients are inclined to perceive threat, view themselves as trapped, be overwhelmed by distressed emotions, or see themselves as hopeless cases.

Anger dysregulation is a transdiagnostic problem (Novaco, 2010), and the sometimes coercive nature of mental health treatment and the aversive character of treatment facilities do little to assuage anger reactions after hospital admission. Clients with intellectual disabilities were once seen as lacking sufficient cognitive capacity or “insight” to benefit from CBT, but a substantial amount of clinical research has demonstrated the applicability of CBT anger treatment for this population in both hospital and community settings (Taylor & Novaco, 2005, 2013; Willner, Jahoda, et al., 2013; Willner, Rose, et al., 2013). As Hastings (2013) has stated, the field is approaching “closer to market” evidence. In that regard, we should also give attention to the economic and managerial costs of patient assaultiveness and at prospective beneficial outcomes associated with psychotherapeutic anger interventions (Felce et al., 2015; Singh et al., 2008).

Anger and assaultiveness are pressing problems for both clinical care staff and hospital managers. Given that assaultive behavior by patients seriously impairs treatment milieu, results in restrictions and diminished chances for discharge, constitutes risk for harm among staff, and has considerable financial cost in workers' compensation claims and employee turnover, the involvement of anger in staff–patient interactions merits far more attention that it has received to date. The present study has demonstrated that assaultive behavior declines following anger treatment. As anger is an element of emotional distress in the lives of patients with developmentally disabilities and those who support them, it should be a high priority for psychotherapeutic intervention.

Conflict of interest

The authors declare that there is no conflict of interests.

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