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## REDUCING ASSAULTS ON AN ACUTE PSYCHIATRIC UNIT USING A TOKEN ECONOMY: A 2-YEAR FOLLOW-UP

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**James P. LePage<sup>1\*</sup>, Kevin DelBen<sup>2</sup>, Scott Pollard<sup>3</sup>, Melanie McGhee<sup>4</sup>,  
Linda VanHorn<sup>4</sup>, James Murphy<sup>3,4</sup>, Pamela Lewis<sup>4</sup>, Ahmed Aboraya<sup>3,4</sup>  
and Neil Mogge<sup>3,4</sup>**

<sup>1</sup>University of Texas Southwestern Medical School,  
VA North Texas Health Care System, USA

<sup>2</sup>West Virginia University, USA

<sup>3</sup>West Virginia University School of Medicine, USA

<sup>4</sup>William R. Sharpe, Jr. Hospital, USA

Token economies are an effective way of changing various behaviors including acquiring new skills, reducing undesired behaviors, reducing aggression, increasing treatment compliance, and improving psychiatric unit management. This study examines the long-term effect of a token economy on an acute care, inpatient psychiatric unit. The two years following the implementation of a unit based token economy are compared with the 12 months prior to implementation. The results show a significant reduction in total assaults as well as fewer staff injuries resulting in loss of time from work. Copyright © 2003 John Wiley & Sons, Ltd.

Violence and injuries on inpatient psychiatric units towards staff and patients are well documented as significant problems (Binder & McNeil, 1994; Blow et al., 1999; Carmel & Hunter, 1993; Lehmann, McCormick, & Kizer, 1999). Aggression rates have been found to occur at over 97 per 100 patients (Cheung, Schweitzer, Tuckwell, & Crowley, 1996) and studies have found that from 75% (Poster, 1996) to 100% (Wynn & Bratlid, 1998) of psychiatric nursing staff report being assaulted at least once during their career. Though many studies found the injuries at psychiatric facilities are relatively minor (Black et al., 1994; Cheung et al., 1996; Kelsall, Dolan, & Bailey, 1995; Wynn & Bratlid, 1998), one prospective study found that using objective measures of severity, 58% of injuries were classified as serious (Owen, Tarantello, Jones, & Tennant, 1998). Further, studies have shown that approximately 61% of frontline staff report some symptoms associated with posttraumatic stress disorder (Caldwell, 1992). Studies have shown time lost from injuries has totaled as

\*Correspondence to: James P. LePage, Ph.D., Domiciliary Care Program #181, 4500 S. Lancaster Rd, VA North Texas Health Care System, USA. E-mail: james.lepage@med.va.gov

much as 2% of a hospital's budget (Hillbrand, Foster, & Spitz, 1996) while others have reported the loss of over 8000 hours and \$76 000 in compensation costs in one facility over a 2 year period (Yassi, 1994).

Overall the preponderance of the data suggests that frontline nursing staff is most likely to be assaulted (Binder & McNeil, 1994; Carmel & Hunter, 1993; Hillbrand et al., 1996; Kelsall et al., 1995; Owen et al., 1998). When differences between the genders of those assaulted were found, the assaulted staff member was most likely male (Carmel & Hunter, 1993; Hillbrand et al., 1996). However the finding of gender differences was not always supported (Binder & McNeil, 1994; Wynn & Bratlid, 1998).

Several factors have been found of those who behave aggressively on psychiatric units. Individuals with psychosis and personality disorders have shown higher rates of aggression than those with depression (Aquilina, 1991; Davis, 1991; Hillbrand et al., 1996; James, Fineberg, Shah, & Priest, 1990). Compulsory and civil admissions were more aggressive than voluntary and forensic admissions (Agarwal & Roberts, 1996; James et al., 1990; Owen et al., 1998). Gender also was shown to play a role in aggression rates, with males being more aggressive than females (Foust & Rhee, 1993; Sebit, Siziya, Acuda, & Mhondoro, 1998; Yassi, Tate, Cooper, Jenkins, & Trotter, 1998). However, one retrospective study reported that staff members reported being assaulted more frequently by female patients (Wynn & Bratlid, 1998).

Age poses a specific and relevant risk factor for violence in adult inpatient settings. Younger age has been found to be associated with higher rates of violence in general psychiatric facilities (Davis, 1991; Hatti, Dubin, & Weiss, 1982; James et al., 1990), forensic facilities (Hillbrand et al., 1996), and general hospital settings (Barlow & Rizzo, 1997). Age also appears to be a significant factor across cultural and national boundaries, for example the Netherlands (Nijman, Allertz, Merckelbach, a Campo, & Ravelli, 1997), Zimbabwe (Sebit et al., 1998), South Africa (Poster, 1996), and the United Kingdom (Poster, 1996). Further, there appears to be an effect of having larger numbers of younger patients on a psychiatric unit at a given time beyond that expected based purely on the cumulative effect. A study evaluating the impact of the number of young-adult patients found that a unit was four times as likely to have an injury to staff, injury to patients, or elopement when there were seven or more young adults on the unit when compared with six or fewer (LePage, Hatton, Pollard, VanHorn, Coffield, & McGhee, 2000).

Token economies have been used to maintain a calm milieu and facilitate treatment. Evaluated in a variety of settings, token economies use operant principles of learning whereby patients earn secondary reinforcers in the form of tokens for performing desired behaviors. These behaviors can be any behaviors chosen by the treatment team (cleaning rooms, practicing anger management, having delusion-free conversations, medication compliance, etc.). Research on token economies was quite

prevalent in the 1960s but declined throughout the 1980s and 1990s despite demonstrating efficacy in widely disparate populations and settings such as chronic psychiatric populations (Glynn, 1990; Paul & Lentz, 1977) and individuals with mental retardation (Hurley & Sovner, 1985; Sisson & Dixon, 1986), substance abuse (Franco, Galanter, Castaneda, & Patterson, 1995), and head injuries (Tate, 1987).

LePage (1999) reduced levels of aggression on an inpatient psychiatric unit for both a young-adult and general admission population following the implementation of a token economy. This study expands on these findings by examining the long-term follow-up by comparing the 12 months before the implementation of a token economy with the 24 months after implementation. It was expected that the number of assaults occurring during the use of the token economy would be lower than those prior to its implementation.

## METHOD

### The Unit

The unit is a 24-bed inpatient psychiatric unit and one of six units in a 150-bed JCAHO accredited state psychiatric facility. The unit serves as a general admission unit and includes the hospital's Medicaid funded neo-adult program. The neo-adult program serves all patients admitted to the hospital between the ages 18 and 20 and provides extra services specifically designed for this age group. Patients older than 20 are admitted to this unit on a rotating basis with the other admission units. Patients admitted to the unit have various diagnoses including chronic mental illness, severe personality disorders, and dual diagnoses.

During the pre-implementation year, 316 patients were admitted. Of these 290 were discharged during this year. There was an average monthly admission rate of 26 (s.d. 6.0) per month. The average monthly discharge rate was 24.67 (s.d. 5.92). 58.5% (176) of admissions were male. Average age for males was 32.8 (s.d. 13.0); average female age was 35.72 (s.d. 12.0). The length of stays, after removing patients with lengths of stay greater than 100 days, was 18.77 (s.d. 19.7) for males and 18.28 (s.d. 18.5) for females. The average daily census was approximately 26 per day.

During the follow-up period, 553 patients were admitted. Of these 526 were discharged during this time. There was an average monthly admission rate of 23 (s.d. 4.3) per month. The average monthly discharge rate was 22.2 (s.d. 4.6). 55.5% (307) of admissions were male. Average age for males was 31.2 (s.d. 11.4); average female age was 35.5 (s.d. 11.6). The length of stays, after removing patients with lengths of stay greater than 100 days, was 22.03 (s.d. 21.5) for males and 21.13 (s.d. 20.5) for females. The average daily census was approximately 27 per day. No significant differences were found within patient variables between the two time periods.

## Description of the Token Economy

Due to initial concerns from advocacy groups about token economies, the program was designed to be voluntary and patients could opt out at any time. Further, if a patient was in the program but refused to be compliant with program aspects such as not paying for reinforcers, a patient could be removed from the program by the team. Due to the available reinforcers and benefits of being in the program over 99% of patients enrolled in the program at admission. Further, patients who were removed from the program typically only remained off the program for one or two days before requesting to be reenrolled.

Patients admitted to the unit were given the option of enrolling in the program at the time of admission. A staff psychiatric aide reviewed the program, gave a patient handbook to the patient, and had the patient sign an agreement form. Patients who were too psychotic to fully understand the program were still given the handbook and enrolled if they desired but received a higher level of verbal prompting to increase the exposure to program reinforcers.

In this program tokens were referred to as 'credits', a term used as there was a negative bias towards the word token and the term token economy at the time of the programs development. Tokens were typically provided as ink-stamps on a sheet of paper. The ink-stamps were penlike instruments with small designs, less than a ¼ inch, in the shapes of happy faces, dolphins, shamrocks, etc. When possible, individual clinicians used a specific marker to monitor compliance and identify where tokens were being earned. The stamps were purchased at the local discount department stores. The sheet the credits were recorded on was a standard sheet of letter-sized paper. The sheet was divided into seven columns, one for each day of the week, with an additional column for recording group names and times of the day. The format allowed a patient, if so desired, to record their schedule each week to facilitate meeting all requirements. The used sheets were collected each Sunday evening and staff prepared a new sheet with unused credits carried forward. The new sheet was given to the patient on Monday morning while used sheets were given to the unit psychologist to review. There were occasional incidents of forging of the tokens either from ink-stamps that were stolen from staff or through attempts to forge a stamp using a traditional marker. These were typically caught by staff with knowledge of the patients' compliance observing inconsistencies in the token sheets. Though counter-intuitive, the staff did not view forging of credits as a major violation; it was viewed that if a patient would risk consequences to forge credits that the credits must be of value and that by taking away the illicit way of 'earning' credits, the patient would continue to be motivated to achieve the reinforcers. A first offence of forging typically resulted in only the removal of the record sheet and the provision of a new one. Second offences could result in removal from the program for an agreed upon time.

In the event that a patient did not appear to value the credits, required more tangible reinforcers, or had individual behavior plans that required a more intensive reinforcement schedule, reinforcement in the form of poker chips was provided. These were also utilized when the shaping of behavior was required. Also, when an individual plan required a high rate of response, which would have allowed access to too many reinforcers, the chips were used as partial payment, requiring, for example, 10 chips to earn one token.

Patients earned tokens for behaviors that facilitated treatment or were consistent with behaviors that would be useful in remaining in the community. These included being on time, staying, and participating in group, taking medication without reminders, attending recreation, showering, cleaning their rooms, and being involved in social activities. Tokens were administered as soon after the behavior as the situation would allow.

Individual behavior plans were utilized to address low frequency behaviors that were not addressed in other ways by the basic procedures. Individual plans were utilized for a broad range of behaviors including increasing food consumption and exercise or practicing relaxation techniques, social skills, or anger management. Typically these utilized the provision of additional tokens for performing the desired behavior. However, in the case of severe inappropriate behaviors (e.g. masturbating on unit, severe foul language, etc.), a response cost could be used in conjunction with reinforcement for an incompatible behavior.

Patients can exchange tokens for off-unit ground passes, shopping trips, extra smoke-breaks, movies, items in a token store, and other similar positive events. The unit provided a token store on Saturday and Sunday. The store was open for approximately one hour each day. Patients could purchase snacks, drinks, rent radios and tapeplayers, and, when available, purchase phone cards. In general the store costs the unit approximately \$10 per day.

The only behaviors that require a response cost (token loss) are violations to major safety rules established by the hospital (e.g. smoking in room) and behaviors that would cause the police to become involved in the community (e.g. hitting or threatening someone, destroying property). These violations result in the loss of all unspent tokens and/or a partial unit restriction. Patients who performed one of these behaviors were not allowed to spend tokens for a minimum of 24 hours, though they could earn tokens during this time.

As staff consistency was of the utmost importance, all staff members were required to be comfortable with all aspects of the token economy. New staff members typically met with the unit psychologist to review the program rationale and policies. Veteran program staff then closely supervised new staff members. In general there were specific staff members that were either formally or informally appointed as the arbiter of disagreements about the implementation of specific policies or procedures. The

unit operated based on the procedures outlined in the token economy and no staff members, whether M.D., Ph.D., R.N., or other members of the team, were allowed to violate the procedures. If procedures were not followed the team would discuss how this occurred and then the policy would be followed. If the violation of the procedures resulted in a patient not receiving the appropriate reinforcement the patient would receive an apology from the team and the situation would be remedied. If, as in the case of violence, the patient did not receive a response cost, the team would institute the cost as soon as it was made aware of the error. Though the delay in the reinforcement or punishment significantly reduced the effectiveness and could lead to increased anger in the case of a response cost, the team viewed the public correction as critical to demonstrate to both staff and other patients that the policies must be followed.

Overall the cost of maintaining the token economy was relatively little. The cost of the store was taken from the unit budget. The ink stamps used as tokens were also purchased with unit budget money though a package of 10 was rarely required more than once every 2 months. New staff's initial meeting with the unit psychologist to discuss the rationale usually lasted half an hour and was conducted during the staff member's training period; they worked closely with another staff member to learn the program but no more closely than prior to the implementation of the program. There was a fair amount of copying due to patient handbooks, staff handbooks, token record sheets, and contracts. The token economy as presented generated approximately 1200 used token record sheets per year but this information could be used to record progress and assess the functioning of the economy.

## Design and Procedure

Two time periods were compared in this AB design study. The first was the 12 months prior to the implementation of the token economy from 15 March 1996 to 14 March 1997. The second time period was the 24 months after the implementation of the token economy from 15 March 1997 to 15 March 1999. To minimize the effect of outliers, patients whose daily incident rate was 3.08 standard deviations or more above the average unit (top 0.1%) were classified as outliers. As this extreme level of aggression was viewed as extremely rare and would contribute significantly to the total incidents, it was believed that inclusion of this patient would obscure useful findings. Using this criterion resulted in one patient being removed from the follow-up period and not used in the analyses.

The number of assaults was examined for differences between each time period. Assaults were defined as staff injuries from patients and intentional patient-to-patient injuries that required any form of medical attention, from visual examination of the injured area to a visit to the emergency room.

All information about injuries, both patient and employee, is generated on the unit after the event. Information is recorded on standardized forms and, once completed, is sent to administrative personnel who transfer all information to usable databases, either in MicroSoft Excel or MicroSoft Access. This data is traditionally utilized for quality improvement and JCAHO requirements. The data utilized for this study was obtained from these databases. In the event of missing information, patient files were reviewed. Further, in the event of patients being involved in multiple events, medical records of these files were reviewed for missing data. The data obtained from the review of medical records and the databases was utilized in both the 1-year pre-token economy period and the 24-month follow-up.

## RESULTS

A one-way multivariate analysis of covariance was used to compare the rates of injuries during the two periods. Four measures of injuries were placed in the model: patient-to-patient, patient-to-employee, self-injury, and hours of employee time lost. The number of neo-adults was utilized as a covariate due to the effect young adults have on the rate of negative events (LePage et al., 2000). The use of statistical analyses was preferred over more traditional graphic representations as the number of neo-adults varied from day to day and their effect needed to be statistically controlled. The use of statistical analyses was also preferred, as they would provide specific information as to the likelihood that fluctuations in data obtained were due to chance variations.

The unit demonstrated significantly lower total injury rates when the token economy was in place ( $F(4, 1090) = 3.81, p < 0.05$ ), with a 33% reduction in the total number of injuries. As can be observed in Table 1, there was a significant reduction in the number of patient-to-patient injuries. Though patient-to-employee

Table 1. Comparison of events prior to and after the token economy

	Without	With	% change
Total injuries	0.60	0.40	-33*
Patient-to-patient injuries	0.32	0.17	-48*
Self-injury	0.14	0.12	-17
Employee injuries (with or without loss of time)	0.15	0.12	-21
Percent of employee injuries identified as causing loss of time	25%	5%**	
Average employee hours lost	0.42	0.02	-93**

\* $p < 0.05$ , \*\* $p < 0.01$ . Numbers are the average events per day.  
Employee hours lost is the average hours lost per day.

and self-injuries reduced by 21 and 17% respectively, these were not statistically significant.

Perhaps more importantly than the overall number of assaults towards staff, patient-to-staff assaults were less severe during the period with the token economy. The number of assaults resulting in reported time lost from work was significantly fewer ( $\chi^2(1, N = 96) = 8.229, p < 0.01$ ; Fisher's exact test  $p < 0.01$ ).<sup>1</sup> Further, the average number of hours lost per day across the time periods was significantly less during the use of the token economy ( $F(1, 1094) = 38.9; p < 0.01$ ).

Based on rates of lost hours, the use of the token economy corresponded to approximately 146 fewer employee hours lost per year. Assuming that these losses of hours were only to psychiatric aides making \$7.50 per hour (an assumption that is unlikely as licensed vocational nurses and registered nurses were also injured during the pre-economy period), the hospital would spend a minimum of \$1095 replacing injured staff time. This amount does not include the need for overtime or the cost accrued through medical treatments. When evaluating patient-to-patient injuries, the use of the token economy resulted in 55 fewer injuries per year. As injuries required a minimum of half an hour of staff time to merely evaluate and complete the standardized reporting form, the token economy resulted in 27.5 hours of saved time. Further savings in medical attention from attending psychiatrists, prn medications, outside consultations to emergency rooms, and internal administrative requirements (i.e. recording of events) were also realized.

## DISCUSSION

The number of total injuries from assaults and the number of employee assaults resulting in loss of work time both decreased significantly after the token economy was implemented. This confirmed expectations that the token economy period would demonstrate lower rates of aggression and violence. The decrease in the number of assaults was observed despite difficulties inherent in a hospital setting. Staff members who were not trained in the token economy often provided coverage on the unit. Also, general staff turnover required time for new staff to become familiar with the system. Both of these factors may have contributed to inconsistencies in the program, resulting in both decreased efficiency of the program and increased frustration for patients.

Several changes were made in the token economy system following the initial pilot study that may be viewed as confounds, but which were a function of the natural evolution of the program. These changes tended to be reflect additional earning

<sup>1</sup>The resulting  $2 \times 2$  table resulted in very small cell size of nine time-loss injuries in the pre-token-economy period and three in the post-token-economy period; a situation which makes the use of the common chi square inappropriate. These small cell sizes required the more stringent and conservative Fisher's exact test, which computes the exact probability of the pattern of responses occurring.

opportunities or costs, based on the needs of the unit. The cost of purchased items was adjusted periodically based on the supply of tokens in the economy and the desirability of the reinforcers. This was accomplished by monitoring the number of unspent credits retained by patients from week to week while monitoring which privileges and purchases were being accessed with the most frequency. The cost of off-unit passes was increased as were the cost of extra smoke breaks. Of interest, with the increase in the cost of smoke breaks there was not a noticeable decrease in the purchase of smoke breaks, a likely function of the strength of smoking as a desired event. The treatment team also began charging patients to stay in the unit dayroom past 11:00 P.M. to reduce the noise level created primarily by the young adults. This rule did not apply to patients who needed to speak with a staff member regarding a problem. Subjectively, staff reported that this policy change did result in a quieter midnight shift, though no differences in aggression rates were noted above the overall decline.

An interesting finding was that there were no differences between the lengths of stay between the two time periods. Though it would have been expected that the reduction in patient aggression and use of individual behavior plans would have resulted in shorter lengths of stay it is speculated that reduced housing options in the community, reduced resources available to mental health centers, and an increase in forensic patients may have contributed to this finding. Since the described economy focused strongly on maximizing treatment adherence and safety, the token economy may not have maximized its focus on behaviors that contribute to discharge (e.g. those behaviors and techniques described by Paul & Lentz, 1977).

There are several limitations to the current program. The first is the use of an AB design. The reality of the clinical setting in a state psychiatric facility precludes the use of a more rigorous ABA design, as the authors could not justify withdrawing the token economy when the data suggested that this could lead to increases in patient and staff injuries. A stronger design model would have been to conduct a multi-baseline where different components were initiated at different times with concurrent evaluations. Further, due to the lack of available trained and willing senior treatment team members on different treatment units, only the unit described utilized a token economy within the hospital, not allowing for multiple unit baseline implementation on different units. Another factor that could have affected the results is the attitude of the staff. After the initial reporting of the pilot data (LePage, 1999), staff became more convinced that the program was effective, began to internalize the model, and worked with the patients with more confidence. Also, the staff became more aware that aggression was an important outcome measure to the program managers and may have become more focused on intervening earlier. These factors are collateral effects of the token economy, not specifically targets of the token economy, but may serve to sustain the effectiveness of the program.

A larger issue involves the use of individual behavior plans. These were more prevalent during the follow-up period and probably contributed to the reduction in aggression noted. This, however, was viewed as a strength of the program. As there was a ready-made form of providing reinforcement in the environment in the form of tokens, it was easier for clinical staff to develop novel plans, and more convenient for staff to administer appropriate reinforcement. Further, the overall focus on behavioral modification, learning, and reinforcement of positive behaviors that was utilized through the token economy probably reduced opportunities for aggression by limiting staff miscommunication and mixed treatment models. Finally, though this report focuses on broad issues of safety and reducing aggression, individual data for patients was collected on both compliance with the broad program and progress towards individual goals.

Token economies may be under-utilized because of misconceptions such as that this type of intervention is abusive, does not foster individual treatment, and does not generalize. Many of these concerns were mirrored in discussion related to approving this project, to the point of one advocacy group requesting that the program be rejected. However, if care is taken to assist all interested parties to learn the important assets that a token economy can bring to a milieu, significant concerns can be alleviated.

The presented study provides substantial data for the long-term impact a token economy can have on the safety and functioning of an acute care psychiatric unit. This token economy required few additional monetary or staff resources to implement or sustain. Though the use of token economies requires consistent implementation at all levels and the effects on recidivism have not been evaluated, the reduction in the number of injuries to both staff & patients should provide an effective incentive for this effort.

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## REFERENCES

- Agarwal, M., & Roberts, M. (1996). Violence among psychiatric in-patients at an Interim Secure Unit: Changes in pattern over a two-year period. *Medicine, Science, and the Law*, *36*, 31–36.
- Aquilina, C. (1991). Violence by psychiatric in-patients. *Medicine, Science, and the Law*, *31*, 306–312.
- Barlow, C. B., & Rizzo, A. G. (1997). Violence against surgical residents. *The Western Journal of Medicine*, *167*, 74–78.
- Binder, R. L., & McNeil, D. E. (1994). Staff gender and risk of assault on doctors and nurses. *Bulletin of the American Academy of Psychiatry and the Law*, *22*, 545–550.
- Black, K. J., Compton, W. M., Wetzel, M., Minchin, S., Farber, N. B., & Rastogi-Cruz, D. (1994). Assaults by patients on psychiatric residents at three training sites. *Hospital and Community Psychiatry*, *45*, 706–710.
- Blow, F. C., Barry, K. L., Copeland, L. A., McCormick, R. A., Lehmann, L. S., & Ullman, E. (1999). Repeated assaults by patients in VA hospital and clinic settings. *Psychiatric Services*, *50*, 390–394.
- Caldwell, M. F. (1992). Incidence of PTSD among staff victims of patient violence. *Hospital and Community Psychiatry*, *43*, 838–839.
- Carmel, H., & Hunter, M. (1993). Staff injuries from patient attack: Five years' data. *Bulletin of the American Academy of Psychiatry and the Law*, *21*, 485–493.
- Cheung, P., Schweitzer, I., Tuckwell, V., & Crowley, K. C. (1996). A prospective study of aggression among psychiatric patients in rehabilitation wards. *The Australian and New Zealand Journal of Psychiatry*, *30*, 257–262.
- Davis, S. (1991). Violence by psychiatric inpatients: A review. *Hospital and Community Psychiatry*, *42*, 585–590.
- Foust, D., & Rhee, K. J. (1993). The incidence of battery in an urban emergency department. *Annals of Emergency Medicine*, *22*, 583–585.
- Franco, H., Galanter, M., Castaneda, R., & Patterson, J. (1995). Combining behavioral and self-help approaches in the inpatient management of dually diagnosed patients. *Journal of Substance Abuse Treatment*, *12*, 227–232.
- Glynn, S. M. (1990). Token economy approaches for psychiatric patients: Progress and pitfalls over 25 years. *Behavior Modification*, *14*, 383–407.
- Hatti, S., Dubin, W., & Weiss, K. J. (1982). A study of circumstances surrounding patient assaults on psychiatrists. *Hospital and Community Psychiatry*, *33*, 660–661.
- Hillbrand, M., Foster, H. G., & Spitz, R. T. (1996). Characteristics and cost of staff injuries in a forensic hospital. *Psychiatric Services*, *47*, 1123–1125.
- Hurley, A. D., & Sovner, R. (1985). Behavior modification III: The token economy. *Psychiatric Aspects of Mental Retardation Review*, *4*, 1–4.
- James, D. V., Fineberg, N. A., Shah, A. K., & Priest, R. G. (1990). An increase in violence on an acute psychiatric ward. A study of associated factors. *British Journal of Psychiatry*, *156*, 846–852.
- Kelsall, M., Dolan, M., & Bailey, S. (1995). Violent incidents in an adolescent forensic unit. *Medicine, Science and the Law*, *38*, 150–158.
- Lehmann, L. S., McCormick, R. A., & Kizer, K. W. (1999). A survey of assaultive behavior in Veterans Health Administration facilities. *Psychiatric Services*, *50*, 384–389.
- LePage, J. P. (1999). The impact of a token economy on injuries and negative events on an acute psychiatric unit. *Psychiatric Services*, *50*, 941–944.

- LePage, J. P., Hatton, F., Pollard, S., VanHorn, L., Coffield, P., & McGhee, M. (2000). The impact of the number of young adults on an inpatient psychiatric unit. *Journal of Psychosocial Nursing and Mental Health Services*, *38*, 33–36.
- Nijman, H., Allertz, W., Merckelbach, H., a Campo, J., & Ravelli, D. (1997). Aggressive behavior on an acute psychiatric admissions ward. *European Journal of Psychiatry*, *11*, 106–114.
- Owen, C., Tarantello, C., Jones, M., & Tennant, C. (1998). Violence and aggression in psychiatric units. *Psychiatric Services*, *49*, 1452–1457.
- Paul, G. L., & Lentz, R. (1977). *Psychosocial treatment of the chronic mental patient: Milieu versus social learning programs*. Cambridge: Harvard University Press.
- Poster, E. C. (1996). A multinational study of psychiatric nursing staffs' beliefs and concerns about work safety and patient assault. *Archives of Psychiatric Nursing*, *10*, 365–373.
- Sebit, M. B., Siziya, S., Acuda, S. W., & Mhondoro, E. (1998). Use of seclusion and restraint in psychiatric patients in Harare Hospital Psychiatric Unit, Zimbabwe: Gender differences. *Central African Journal of Medicine*, *44*, 277–280.
- Sisson, L. A., & Dixon, M. J. (1986). Improving mealtime behaviors through token reinforcement: A study with mentally retarded behaviorally disordered children. *Behavior Modification*, *10*, 333–354.
- Tate, R. L. (1987). Behaviour management techniques for organic psychosocial deficit incurred by severe head injury. *Scandinavian Journal of Rehabilitation Medicine*, *19*, 19–24.
- Wynn, R., & Bratlid, T. (1998). Staff's experiences with patients' assaults in a Norwegian psychiatric university hospital: A pilot study. *Scandinavian Journal of Caring Sciences*, *12*, 89–93.
- Yassi, A. (1994). Assault and abuse of health care workers in a large teaching hospital. *Canadian Medical Association Journal*, *151*, 1273–1279.
- Yassi, A., Tate, R., Cooper, J., Jenkins, J., Trottier, J. (1998). Causes of staff abuse in health care facilities. Implications for prevention. *AAOHN Journal*, *46*, 484–491.

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