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A Behavioural Training Programme for Chronic Schizophrenic Patients

A Three-Month Randomised Controlled Trial in Beijing

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(translated by Michael R. Phillips)

This paper discusses the effectiveness of an in-patient rehabilitation programme administered by nurses that combines life skills training, active encouragement, and a token economy. Fifty-two chronic schizophrenic patients with prominent negative symptoms who had been continuously in hospital for at least a year were randomly assigned to the experimental or control group. The training and associated reinforcement schedule were administered daily to experimental subjects by two specially trained rehabilitation nurses. Control subjects did not receive training or reinforcement but were individually asked to perform the same daily tasks and participate in the same activities as the experimental-group subjects. Patients in both groups received their previous dosage of medication throughout the trial. After three months the severity of negative symptoms, as assessed by blind evaluators, decreased in both groups of subjects, but the improvement in the experimental group was much greater than that in the control group. These findings demonstrate the efficacy of behavioural interventions for chronic schizophrenic in-patients in China and highlight the importance of changing the role of Chinese psychiatric nurses from that of custodians who control patients' behaviour to that of therapists who provide psychological and behavioural treatment.

Deterioration in the psychosocial functioning of chronic schizophrenic patients is a major problem in China's long-term psychiatric hospitals. Prolonged hospital stay leads to a progressive decline in patients' ability to take initiative in managing basic problems of living such as getting up, eating, and attending to one's personal hygiene. In the West various types of behavioural therapy programme have been beneficial in minimising or retarding this process (Butler & Rosenthal, 1985), but in China psychiatric institutions have no clinical psychologists, social workers, or occupational therapists to administer such programmes, and Chinese psychiatrists and psychiatric nurses are not trained in these methods. There are, therefore, few reports about behavioural treatment for chronic schizophrenic patients; the only controlled study published in China (Xu *et al*, 1988) demonstrates the effectiveness of using a token economy to improve the negative symptoms of schizophrenic patients involved in a work therapy programme.

This current paper discusses the results of a randomised controlled trial of the effectiveness of a programme that combines life skills training with positive reinforcement (based on psychological encouragement and a token economy) in the rehabilitation of schizophrenic in-patients. The study was undertaken at a chronic-care psychiatric hospital in Beijing from November 1989 to February 1990. We also discuss the need to change the traditional custodial role of Chinese psychiatric nurses to one in which they are active participants in providing rehabilitation therapy to chronic psychiatric in-patients.

Method

Selection and assignment of subjects

Enrolled subjects were schizophrenic in-patients on one locked male ward and one locked female ward who met the following inclusion criteria: (a) they met the Chinese Medical Association's (1985) diagnostic criteria for schizophrenia – the 'Yellow Mountain' criteria; (b) their dominant clinical symptoms were negative symptoms – the total score on the revised Chinese version of the Scale for Assessment of Negative Symptoms (SANS–CV) (Phillips *et al*, 1991) was 25 or over – and they manifested no prominent agitation, depression, suicidal behaviour, aggressiveness, or catatonic rigidity; (c) their duration of illness was greater than five years and their current hospital stay had lasted for at least one year; and (d) they were under 60 years of age and had no serious medical illnesses.

In total, 52 patients who met these criteria were identified, 28 men and 24 women. To ensure the comparability of the experimental and control groups, these subjects were randomised in two blocks defined according to the severity of their negative symptoms (SANS–CV total score less than or equal to 50, and greater than 50). After randomisation there were 28 subjects in the experimental group (14 men

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and 14 women) and 24 subjects in the control group (14 men and 10 women). To simplify the operation of the study, their beds were arranged such that all the same-sex treatment-group subjects were in a single room and all the same-sex control-group subjects were in a single room (there are eight 14-bed rooms in each of our wards).

Intervention

The intervention used in this study is an adaptation of the method described by Yang (1986). Both groups of patients continued to receive their previous dosage of neuroleptic medication throughout the three-month trial. Patients in both groups were told the behavioural expectations of staff, but only the experimental-group subjects were given life skills training and positive reinforcement. The specific steps in the programme were as follows.

Prior to starting the intervention, the two nurses responsible for teaching life skills to the patients, providing reinforcement for appropriate behaviour, and recording behavioural observations of the patients' functioning were given an intensive one-week training course that included lectures, discussion groups, and practical demonstrations focused on teaching them (a) the basic theory of behavioural therapy; (b) how to operate a token economy and provide psychological encouragement; and (c) how to administer the revised version of the Nurses Observation Rating Scale (NORS) (Wang & Jiang, 1989) used in this study (see Appendix). Since the method of coding this behavioural rating scale is quite straightforward, we did not undergo formal inter-rater reliability testing.

Prior to starting the life skills training, both groups of subjects received daily necessities (i.e. wash basin, towel, soap, soap dish, toothpaste, toothbrush, cup, and comb) and individual lockers in which they could lock up their personal possessions. The following behavioural goals were discussed with all patients:

(a) that the patient should take initiative in performing daily activities such as getting up, washing, eating, and going to bed at the appropriate times
(b) that the patient should take care of personal appearance and hygiene; the patient should dress neatly, wash and shower regularly, cut his or her hair and nails as needed, and – for female patients – manage menstrual periods appropriately
(c) that the patient should keep his or her personal space neat; the patient should make his or her bed and take care of personal possessions
(d) that the patient should actively co-operate with all forms of treatment; the patient should take medication as prescribed and participate in ward activities (morning exercises, listening to music, etc.)
(e) that the patient should help nurses in keeping the ward clean and tidy.

Once these general goals were described to all the patients, the token-economy method of obtaining rewards for achieving treatment goals was explained to the experimental-group patients (but not to the control-group patients). Experimental-group patients were then questioned about their personal wants, and the specific rewards for each patient were determined accordingly. Most of the requests were for daily necessities, food items such as sugar or canned fruit, or privileges off the ward for walks or visits to a local park. For some patients who had unique behavioural problems that were particularly difficult to change (such as urinating on the floor), individualised treatment goals that were different from the general goals (listed above) were established.

Once the intervention phase of the programme started, the two nurses provided regular training in daily life skills to experimental-group patients (but not to control-group subjects); for example, they explained how to organise one's bed and manage one's personal possessions. These nurses also organised occupational, recreational, and sporting activities for all the patients (experimental and control patients) that included cleaning of the ward, reading books and papers, daily calisthenics, contests in bed-making, and crafts demonstrations. This active intervention phase continued four hours per day, six days a week for three months.

Each day during the intervention phase, control-group subjects were individually asked to perform the same tasks (e.g. make their beds and organise their possessions) and to participate in the same social activities as the experimental-group subjects, but, unlike the experimental-group subjects, they were not given any life skills training and they were not rewarded for their participation in activities.

The behavioural rating chart was completed by the two nurses each day for each patient (both experimental- and control-group patients). Experimental-group patients were given tokens each day their score exceeded the mean daily score for the entire experimental group in the previous week. Thus the complexity of expected goals increased as patients' average level of function improved over the three-month course of treatment. Severely limited patients (who might have had difficulty exceeding the group average score) were, at the discretion of the rehabilitation nurses, given tokens immediately after successful completion of tasks that they found difficult. At the end of each week, experimental-group patients were able to cash in their tokens for material rewards. Experimental-group subjects also received praise from the two rehabilitation nurses when they completed difficult tasks and at the end of the week if they had shown overall improvement. Control-group subjects were evaluated daily but they received neither material nor psychological incentives.

Evaluation of outcome

Patients in both groups were evaluated at enrolment, in the middle of the intervention period, and at the end of the intervention period using SANS–CV. Evaluations were done by one nurse and one doctor who were blind to the patients' treatment status. Prior to starting the study they had one week of training in the use of the instrument; their inter-rater reliability – as assessed by comparing their results for 15 schizophrenic patients – was excellent: the intraclass correlation coefficient (Zar, 1984) was 0.79 ($F=8.92$, $P<0.001$). During the study proper they simultaneously

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Table 1
SANS-CV results before and after intervention for the 21 experimental-group subjects and 19 control-group subjects

Subscale	Experimental group Mean (s.d.)	Control group Mean (s.d.)	*t*-value, experimental v. control	*t*-value, before v. after[1] Experimental group	Control group
Total score					
at enrolment	50.1 (12.6)	53.8 (14.0)	0.17	8.52***	3.13**
at end of trial	31.9 (11.6)	44.6 (16.0)	2.90**		
Flattened affect					
at enrolment	13.5 (4.47)	13.5 (5.72)	0.01	4.70***	1.78
at end of trial	9.52 (4.23)	11.2 (5.44)	1.07		
Poverty of thought					
at enrolment	6.57 (3.58)	6.53 (2.78)	0.04	3.98***	1.55
at end of trial	3.71 (3.08)	5.53 (3.09)	1.86		
Lack of motivation					
at enrolment	15.6 (2.81)	16.3 (3.83)	0.71	12.19***	5.34**
at end of trial	7.38 (3.02)	12.7 (3.82)	4.88***		
Loss of interests					
at enrolment	15.4 (3.57)	14.6 (5.06)	0.58	4.89***	1.60
at end of trial	11.0 (2.72)	13.2 (5.47)	1.64		
Attention deficit					
at enrolment	1.95 (1.94)	1.58 (2.08)	0.58	4.29***	1.13
at end of trial	0.19 (0.58)	0.95 (1.98)	1.68		

1. Paired *t*-tests are used for before-versus-after comparisons.
*$P<0.05$, **$P<0.01$, ***$P<0.001$.

interviewed the patient (in a separate examination room on the ward) for about 20 minutes, consulted the rehabilitation nurses' behavioural record for information needed to assess two items in the motivation subscale (perseverance in work and level of physical activity), and then discussed any differences in scoring before recording the consensus score for each item.

The daily behavioural rating scores, though collected in a non-blind fashion, were also used to assess outcome. The mean daily score for the first week of intervention was used as the baseline score and the mean daily score for the last week of intervention was used as the outcome score.

Results

The three-month programme was completed by 21 of the 28 experimental-group subjects and 19 of the 24 control-group subjects. Of the 12 drop-outs (23.1%), five developed concurrent medical illnesses that precluded continuing the treatment, four went on home leave over the Spring Festival holiday, two were discharged before the end of the three-month programme, and one had a relapse of positive symptoms. There were no significant differences between the patients who dropped out and those who remained in the study or between the seven experimental-group drop-outs and the five control-group drop-outs.

For experimental- and control-group subjects who completed the trial, the mean ages were 40.5 years (s.d. 10.2, range 26–59) and 41.7 years (s.d. 7.3, range 32–56), respectively ($t=0.42$, d.f. 38, $P>0.05$); the mean durations of illness were 18.1 years (s.d. 7.7, range 5–29) and 19.7 years (s.d. 8.4, range 5–34) ($t=0.63$, d.f. 38, $P>0.05$); the mean durations of the current admission were 76.1 months (s.d. 77.8) and 133.5 months (s.d. 109.4) ($t=1.87$, d.f. 38, $P>0.05$); and the mean chlorpromazine-equivalent doses of medication were 532 mg/day (s.d. 219) and 499 mg/day (s.d. 201) ($t=0.50$, d.f. 38, $P>0.05$).

Table 1 shows the SANS-CV results for the two groups of subjects. At the time of enrolment, there were no significant differences in the SANS-CV total score or in the SANS-CV subscale scores between the two groups. The mean total SANS-CV score and mean subscale scores all dropped significantly in the experimental group over the three month intervention. The scores for the control group also dropped over this period, but only the reductions in the total score and in the Lack of Motivation subscale score were statistically significant. At the end of the intervention, the mean SANS-CV total score and all the mean subscale scores were lower in the experimental group than in the control group; the differences were statistically significant for the overall score and for the Lack of Motivation subscale score. The overall improvement in negative symptoms, as assessed by the adjusted percentage drop in the SANS-CV total score (i.e. the drop in a patient's score divided by the mean score of all subjects at enrolment), in the experimental group was twice that of the control group (39.9% (s.d. 20.9%) v. 17.1% (s.d. 23.0%); $t=3.20$, d.f. 38, $P<0.05$).

The results for the behavioural rating scale are as follows. The mean daily scores in the first week of enrolment for the experimental and control groups were 12.55 (s.d. 4.53) and 25.30 (s.d. 10.07), respectively ($t=5.25$, d.f. 38, $P<0.001$). In the last week of the intervention the mean daily scores were 4.85 (s.d. 5.52) and 21.02 (s.d. 12.26), respectively ($t=5.47$, d.f. 38, $P<0.001$). The mean percentage drop (i.e. improvement) in the behavioural

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rating score over the treatment period in the experimental group was almost four times that in the control group (61.4 % (s.d. 48.3%) v. 16.9% (s.d. 34.2%); $t=3.33$, d.f. 38, $P<0.005$).

Discussion

Limitations of the study

There are several limitations of the study. First, the proportion of drop-outs was relatively high (23.1%). The proportions of drop-outs in the two groups were not, however, significantly different and the reasons for dropping out had nothing to do with the interventions. It is, therefore, unlikely that the high drop-out rate biased the outcome of the study.

Secondly, the blind coders consulted the behaviour rating charts (which were coded by non-blind evaluators) to score two of the items on the SANS–CV motivation subscale (perseverance in work and level of physical activity). The behaviour rating charts had much more detailed information on these items than could be obtained during the 20-minute SANS–CV interview; but using this information may have biased the Motivation Subscale scores in favour of the experimental group.

Thirdly, there was no pre-intervention baseline for the behavioural rating scale. Given the random assignment to groups and the pre-intervention similarity of the SANS–CV scores between the two groups, the significant difference in the behavioural rating scores at the end of the first week of the intervention is probably due to the intervention itself; it would, however, have been preferable to have the pre-intervention behavioural rating scores for the two groups.

Fourthly, experimental-group patients were rewarded if their daily behavioural rating was higher than the mean daily rating for the experimental group in the previous week. A more sensitive method would be to reward patients if their daily score was higher then their own mean score in the previous week. This individualisation of the reward schedule would continue to challenge the higher-functioning patients and would make it easier for the lower-functioning patients to get rewarded – thus increasing their motivation to improve.

Fifthly, the three-month intervention was relatively short. No long-term follow-up of the patients' functioning after the three months was attempted, so it is not known how long the changed behaviour will be sustained once the reinforcement schedule is terminated. With a larger sample and a longer follow-up time, it may be possible to disengage the independent treatment effects of regular requests to perform tasks, life skills training programmes, and positive reinforcement.

Implications of the results

These limitations do not seriously affect the basic finding of the study that behavioural interventions improve the level of functioning of chronic schizophrenic in-patients. This randomised, controlled, single-blind trial of how life skills training, recreational activities, and positive reinforcement affected the negative symptoms of chronic schizophrenic in-patients found that all types of negative symptoms improved significantly over the three-month intervention period. Patients who were regularly asked by staff to do daily tasks and participate in social activities but received no training and no reinforcement also showed improvements in their negative symptoms but these improvements were, except for the change on the Lack of Motivation subscale of SANS–CV and the overall SANS–CV score, non-significant. At the end of the intervention, the overall severity of negative symptoms and the severity of the motivational deficits in the patients who received skills training and regular reinforcement were significantly less than in patients who did not receive training or reinforcement. Thus training and positive reinforcement appear to be particularly effective in improving the level of motivation of chronic schizophrenic in-patients, and somewhat less effective for the affective, cognitive, attentional, and socialisation deficits of these patients.

Lack of initiative is the main behavioural problem of long-term in-patients with chronic schizophrenia, whose clinical picture is dominated by negative symptoms and an inability to manage their daily affairs. This study demonstrates convincingly that behavioural interventions can recoup some of these lost skills. At the end of the treatment period, experimental-group patients were able to observe the ward schedule of getting up, eating, going to bed, and so forth; to maintain a satisfactory level of personal hygiene and tidiness; to co-operate with the treatment programme; to keep their personal space clean and tidy; to participate in ward activities; and to manage their personal possessions. Overall, these patients showed a marked improvement in their ability to function independently in the ward setting. Control-group patients who did not receive life skills training and positive reinforcement were, nonetheless, given specific behavioural goals at the beginning of the intervention period, asked to perform daily tasks and participate in ward activities, and regularly exposed to the behaviour of the experimental-group patients (who were on the same wards) during the

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intervention period; some of them also showed improvement in their ability to function independently. Given that all of these patients were seriously disabled at the time of enrolment and had been in hospital continuously for more than one year, this degree of improvement within three months is remarkable. This finding supports the argument that at least some of the social dysfunction seen in chronic schizophrenia is the result of disuse (the so-called 'hospitalisation syndrome') and not due to irreparable neurological damage. Clearly, behavioural training programmes focused on life skills should be instituted in other chronic-care psychiatric facilities in China.

Our findings are similar to those of both foreign (Butler & Rosenthal, 1985) and other Chinese (Xu *et al*, 1988) researchers, who have repeatedly shown that the combination of positive reinforcement and behavioural intervention is an effective method of rehabilitating chronic schizophrenic patients. Most authors (Chen, 1989) believe either continuous or intermittent (for example, weekly) reinforcement is effective in improving chronic psychiatric patients' behaviour, but that behaviour moulded by an intermittent reinforcement schedule will be more difficult to extinguish. In our study, experimental-group patients were given tokens on a daily basis but were only able to redeem these tokens on a weekly basis; we thus combined both continuous and intermittent forms of reinforcement. We believe that this type of reinforcement schedule combined with appropriate encouragement and praise is particularly useful for achieving a good rehabilitative effect with chronic psychiatric patients.

Several important questions remain. First, do the changes in the behaviour of the experimental group persist after the reinforcement mechanisms are withdrawn? If not, how long must the reinforcement schedule be continued? Second, is the behavioural change seen in the group who were simply requested to perform tasks less persistent than the behavioural change in the group that also received training and reinforcement? Third, if treatment of this kind were continued, how much better would such chronically disabled patients get? Would they progress to the point that some of them could be discharged? More research with longer follow-up periods and larger samples is needed to address these issues.

Need for changes in the traditional model of nursing

Having demonstrated that behavioural treatment is beneficial to chronic schizophrenic in-patients in China, the next task is to determine who should administer these interventions. Chinese psychiatric hospitals have no psychologists, occupational therapists, recreational therapists, or social workers. All the direct clinical care is provided by physicians and nurses. Typically, doctors do diagnostic examinations, institute treatment plans, and monitor patients' clinical progress, while nurses administer the treatment and manage the patients. Clearly, nurses are the mental health professionals who should administer behavioural treatment in China, but the vast majority of the tens of thousands of psychiatric nurses in the country are seen as – and often see themselves as – custodians whose primary function is to guard patients, to control their behaviour, and to take care of some of their daily needs. This old model of psychiatric nursing does not help – and may even hinder – the rehabilitation of mentally ill in-patients. There is a dawning awareness of the magnitude of this problem in China, but the related problem of defining a new, professional role for psychiatric nurses, a role in which they are active participants in the therapeutic process, has received little attention from Chinese psychiatric circles.

The developing field of psychiatric rehabilitation is an excellent opportunity to redefine the role of psychiatric nurses in China. Our study on the effectiveness of behavioural interventions in the rehabilitation of chronic schizophrenic in-patients is a good example of the roles nurses can play: the study was designed, implemented, and evaluated by nurses. Most experts believe that the outcome of behavioural therapy depends heavily on the relationship between the patient and therapist (Butler & Rosenthal, 1985). Since nurses have much more face-to-face time with patients than doctors, and since there are no other types of mental health professional available, one of the new roles that Chinese nurses should assume is that of 'behavioural therapist'. Such a change would be consistent with the concept of 'primary nursing' – where each patient has a specific nurse to whom he or she is expected to refer problems – that is just starting to develop in China. The primary-nursing method of managing chronic schizophrenic patients would, necessarily, address the patient's core problem of lack of initiative, and so psychiatric nurses who used the primary-nursing method would be trained to adopt appropriate behavioural interventions that can help patients manage their daily lives.

Only nurses have the time with patients to establish the close and harmonious relationships and to provide the immediate and constant feedback needed to ensure the success of behavioural programmes. And since behavioural interventions are one of

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the major components of psychiatric rehabilitation, this implies that nurses have a key role to play in the provision of rehabilitation services to chronically mentally ill patients. Conversely, in-patient rehabilitation programmes in China will have limited success until the traditional role of nurses as custodians has been replaced with a new, more professional, role of nurses as therapists. The success or failure of the rehabilitation effort in China, in India (Sharma, 1993), and in other developing countries depends on a fundamental change in the role of psychiatric nurses.

Appendix: Behavioural chart adapted from NORS

Each item is scored for each patient daily on a 0–3 scale by the observing nurse, so for the 18 items the range of total scores is from 0 to 54. Each day the experimental-group patients are given tokens (which they can cash in at the end of the week) according to their performance. The criteria for the scores are as follows:

0 does the activity without needing reminder
1 must be reminded to do the activity
2 must be urged to do the activity
3 unable or unwilling to do the activity even with urging.

Items

1. Gets up on time
2. Goes to bed on time
3. Takes medication on time
4. Washes face
5. Brushes teeth
6. Washes feet
7. Clothes are tidy
8. Combs hair
9. Makes bed
10. Washes hands before eating
11. Has good table manners
12. Does calisthenics
13. Level of function in occupational therapy
14. Participation in recreational activities
15. Participation in activities off ward
16. Management of personal possessions
17. Attitude in interacting with others
18. Co-operation with medical staff

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