The effects of a compliance therapy programme on Chinese male patients with schizophrenia

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Abstract   Studies have found prevention of relapse, symptom control and recovery are associated with treatment regime compliance, and psychoeducation motivational interviewing skills promoted compliance for up to two years. This prospective experimental study with randomized single blind design investigated Compliance Therapy Programme (CTP) effects on forty-seven recruited male Chinese patients with schizophrenia that were randomly allocated to control or experimental groups. Both groups received routine treatment, and the experimental group also received compliance therapy programme. All subjects were pre-tested with the Brief Psychiatric Rating Scale, Drug Attitude Inventory–Chinese version and Self-Report Drug Compliance. Before discharge their symptoms were reassessed with the BPRS. An independent assessor reassessed subjects with an identical battery of assessments at three and six months post-discharge to investigate intervention effects. Outpatient follow-up records were traced. Both groups demonstrated improved symptom scores of a similar magnitude over their hospitalization scores. Experimental group subjects exhibited the advantages of follow-up compliance, (p<0.05). Subjects able to keep outpatient follow-up for three months were more likely to remain compliant. The compliance therapy programme was shown to be a pragmatic measure to improve outpatient compliance follow-up for six months, at least.

INTRODUCTION

Research has shown that to secure symptom control and recovery from both mental illnesses and general medical diseases, maintaining compliance with prescription medication regimes was crucial to self-administered treatment. Haynes *et al.* (1997) emphasized that assuring compliance is far more important than treatment itself. In Western countries, 43% to 62% of people with mental illness were non-compliant (Dunbar-Jacob *et al.*, 2000; Kent & Yellowlee, 1994) and that a 50% re-hospitalization rate for psychiatric patients was thought to be associated with non-compliance with treatment regime (McFarlane *et al.*, 1995). In Mainland China, drug compliance for inpatients ranged from 13%-85% (Xie *et al.*, 2002) and for outpatients it was about 54% (Wang & He, 2004). Drug compliance among Chinese with medical diseases such as diabetes mellitus was

about 75% and partial compliance was common (Zhou & Wang, 2002).

Over the last decades, various approaches to enhance compliance have been developed. They range from psychoeducation to cognitive–behavioural interventions. Nonetheless no single strategy was proven absolutely superior to any other. The reasons were multi-dimensional and complex (Kemp *et al.*, 1996), but motivation was found to be crucial to compliance (Kemp *et al.*, 1998; Cameron, 1996). Kemp's studies (Kemp, 1996 & 1998) found that the global functioning scale and post-discharge compliance were improved for two years among those schizophrenics who received five consecutive counselling sessions with psychiatrists.

Inspired by Kemp's studies, the researcher formulated a similar cognitive-behavioural therapy called

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Compliance Therapy Programme (CTP) to investigate its effects on a group of Chinese patients with schizophrenia.

LITERATURE REVIEW

Compliance

Compliance has various meanings to different authorities. For health care workers in Hong Kong, the popular working definition of compliance is "the extent to which a person's behaviour coincides with medical and health advice." (Haynes, 1979). As a quick reference to the compliance of people with mental illness, it is common practice for health care workers to focus on drugs and follow-up.

Drug compliance was different among different groups of patients across different settings over time. In Western countries, clinical compliance was from 70% to 90% and outpatients' compliance was from 50% to 75% (Cramer & Rosenheck, 1998; Barnes et al., 1997). Drug compliance worsened over time (Kane, 1985; Kane & Bornstein, 1985); post-discharge compliance was from 36% to 52% within the first and second years respectively (Weiden & Olfsen, 1995). A fifty percent rate of psychiatric re-hospitalization was thought to be associated with defaulted treatment regime (McFarlane et al., 1995). In Mainland China, drug compliance for psychiatric inpatients ranged from 13%-85% (Xie et al., 2002) and for outpatients about 54% (Wang & He, 2004). Drug compliance among Chinese with medical diseases such as diabetic mellitus was about 75% and partial compliance was common (Zhou & Wang, 2002). Partial compliance was common in people with chronic illnesses (McCellan & Cowan, 1970). It is characterized by their taking the drugs that they thought useful, and adjusting the dosage in accordance with how they felt (Day & Moore, 1992).

Factors associated with compliance

Compliance is associated with health beliefs, cognitive function, insight, types of illness, psychosocial factors, doctor-patient rapport, pharmacological effects, types of drugs, complexity of treatment regime and adverse drug effects (Weiss et al., 1998). Demographic variables were not convincingly associated with compliance (Hornung et al., 1998). Owing to their complexity, strategies to enhance compliance varied according to different schools of thought. They ranged from purely cognitive approaches such as psycho-education, behavioural approaches to self-medication training, cognitive-behavioural approaches to compliance therapy, and psychosocial approaches to family carers. Each of them carried distinctive themes, which were applicable to particular patients in specific contexts. Intervention options depended on the uniqueness of patients and accessible resources.

Compliance Measurement

Compliance can be measured using different measurements, including consultation, biological assay, carers' reports, community psychiatric nurse visits, patient self-reports, pill count, post-discharge follow-up records and attitudes to medications. The measurement tools for this study were the psychiatric rating scale, the patient's attitude to medication, self-report of drug taking and post-discharge follow-up attendance for the sake of its sensitivity and specificity to interventions. Collateral information from healthcare providers' reports and carers' reports were excluded because of the difficulty of obtaining ethical approval for this study.

METHOD

This study is a prospective experimental study with a randomized single blind design to investigate the effects of a compliance-enhancing strategy called Compliance Therapy Programme for Chinese male patients with schizophrenia.

Forty-seven Chinese male inpatients with schizophrenia according to the International Classification Diagnosis – Version 10 (ICD-10), that during their current psychiatric hospitalization had been warded for 2 weeks and that scored 24 or above on the CMMSE scale, were recruited. Subjects were allocated to the control and experimental groups according to a random table.

At baseline, the researcher requested that subjects complete a battery of assessments before the interventions, including the BPRS, DAI-C, and

SRDC. As an interim monitoring measure, a different assessor reassessed subjects using the BPRS just before discharge. Two quarterly assessments were repeated by an independent assessor using the identical battery of baseline assessments at three and six months post-discharge. Outpatient follow-up records (FU) were traced with the Clinical Management System of the Hospital Authority (Figure 1 see appendices).

In order to illustrate the effects of the CTP with statistical meaning, the planned sample size of this study was about 110 subjects for each group, with an effect size of 0.4 (27), $\beta=0.20$ (80%), a power at 5% ($\alpha=0.05$) with a 25% attrition rate (Lukoff et al., 1986).

DATA ANALYSIS

To check for significant differences ($P<0.05$), the normality test was used on the outcome measurement. In case significant differences were identified, non-parametric analysis was employed as a prudent approach for such a small-size data set. Mann-Whitney U-test was used to identify between-group differences. The Wilcoxon signed-rank test was used to identify the changes of within-factors for different outcome variables over time. Friedman tests and Cochran tests were used to identify outcome variables differences over the course of the study. The Chi-square test was used for categorical data and correlation study.

Ethical and Legal considerations

Before the study began, the study hospital and the university granted ethical approval. Written consent was sought from subjects. Authorization was sought from the authors of the study instrument to translate and use the instrument.

If recruited subjects refused to comply with the group allocation at the very beginning of the study, their decision was respected and their attributes were not used in this study. On the other hand, for fairness in granting access to treatment, interested in-patients were allowed to join the programme even though they had refused to participate as subjects.

Sample characteristics

Subjects were recruited into this study if they were 18 years old or above, not diagnosed as mentally retarded or autistic, Primarily diagnosed with schizophrenia according to the International Classification Diagnosis – Version 10, able to hear, read and speak in Cantonese, Indication for long-term neuroleptic medication on an outpatient basis, and at least one week of psychopathological stability as reflected in the case notes.

Subjects were excluded if they were mentally unstable as reflected in the case notes, yielded a Cantonese Mini Mental State (CMMS) score below 24, holding persecutory delusions to medication, diagnosed as substance abuser, known to have marked cognitive deficits, and behaving destructively.

MEASURES

Brief Psychiatric Rating Scale

The Brief Psychiatric Rating Scale (Lukoff et al., 1986), which is an expanded version of the original BPRS (Faustman & Overall, 1999), was selected for this study. The constructs were rated on a seven-point scale ranging from one (as absent of manifestation) to seven (as most severe manifestation) with a score span from 24 to 168. The application of the BPRS was user-friendly for any well-trained health care professional (Chan & Lai, 1993) with substantial clinical experience in the psychiatric field (Derek et al., 2001).

To assure its validity and reliability, the involved assessors were trained and underwent inter-rater reliability testing. The test was divided into 2 phases. In phase one, each assessor interviewed five subjects twice within one day. At the time of interview, one interviewer rated the subjects with the BPRS, while the other assessors acted as silent raters. In phase two, a psychiatrist and one of assessors rated ten inpatients at the same time to determine the consensual validity of diagnostic concepts (Overall & Gorham, 1962). Their ratings were computed with the intra-class correlation coefficient (ICC). The results of the ICC for the first and second phases of the inter-rater reliability test were 0.8262 and 0.8959 respectively, which was regarded as acceptable.

Drug Attitude Inventory-Chinese version

Drug Attitude Inventory (DAI) (Awad & Howe, 1993) was a self–administered questionnaire specifically designed to measure subjective responses to neuroleptic medication. It comprised ten items and covered seven constructs: (1) subjective positive response, (2) subjective negative response, (3) health / illness, (4) physician, (5) control, (6) prevention and (7) harm. Each item was a self-report statement with which the subject either agrees or disagrees. The correct answer to each item is scored +1 and the incorrect response is scored –1 respectively. The final score was the sum of the total of pluses and minuses, which ranged from –10 to +10. A positive score meant a positive subjective response (compliant) and vice versa. It took subjects not more than five minutes to complete the questionnaire (Appendix 1).

The DAI-C is a Chinese version of the DAI, which has been field-tested with good psychometric properties; internal consistency (α= 0.93, P<0.001), test-retest reliability (α = 0.82), and a fair degree of discriminate, predictive and concurrent validities (α = 0.76) (Awad, Vorguanti & Heslegrave, 1997). The DAI translation complied with the recommendation of the European Organization for Research and Treatment with the help of a group of psychiatrists and mental health nurses. The average congruence score of the translation in rating "equivalence" was 94%, "relevant to the Hong Kong context" was 97%, and "overall agreement" was 91%, which surpassed the recommended requirement of 90%. The semantic equivalence of the Drug Attitude Inventory-Chinese version (DAI-C) was established.

Self-reported drug compliance

The SRDC derived from the interview guide of Adams and Howe (1993) measured the patients' subjective drug compliance. It utilizes a five-point Likert scale with specified criteria attached to each category with 1- total drug refusal; 2 - about 25% drug compliance; 3 - about 50% drug compliance; 4 - about 75% drug compliance; 5 - 100% drug compliance. The item was translated from English to Chinese for the present study, which was scrutinized by a panel of experts to establish its content validity. To minimize the effect of forgetfulness, the span for subjects to evaluate their self-medication was confined to the "last three days" only. However, at pretest the subjects were asked by the researcher to evaluate their drug compliance before their current admission.

Outpatient follow-up record (abbreviated as FU)

Subjects attending the Hospital Authority outpatient follow-up clinic retained a record for longitudinal reference. The electronic record served as proxy indicator of follow-up compliance for this study. Subjects that attended the follow-up as scheduled or before they were due were regarded as compliant. Moreover, subjects that entirely defaulted on follow-up or were over-due were regarded as non-compliant. The collated information was verified with the material record.

Demographic information

Demographic information was collected from perusal of the medical record with clarification from subjects.

INTERVENTIONS

Characteristics of Standard Treatment (ST)

The ST comprised pharmacological therapy, primary nursing care, occupational therapy, psychoeducation, counselling, self-help training, grooming training and psychosocial support from allied health disciplines. Each kind of treatment specifically addressed a particular perspective on psychiatric rehabilitation. Variation in terms of intensity and frequency of ST might exist owing to the uniqueness of the individual. From a theoretical point of view, such variation should be differentiated in detail to promote accuracy of analysis. However, such analysis has never been attempted in substantial significant studies, and is considered practically impossible. Practically speaking, the ST was almost identical in local psychiatric settings as elsewhere in western countries. Drug treatment often started immediately at admission. The pre-test was scheduled for the second week after admission to reduce drastic variations in psychopathology.

Characteristics of the Compliance Therapy Programme (CTP)

The CTP comprised a series of semi-structured cognitive-behavioural activities. A psychoeducational kit was specifically prepared with reference to Boswell (1988) . Only one therapist (the researcher) conducted the CTP in small groups, two to three times a week. The therapist adopted the motivational interviewing skills as proposed by Rollnick & Miller (1995) throughout programme. Each session was marked by distinctive highlights, and the exploration of personal feelings, experiences and beliefs over the treatment regime were cardinal. Group discussion was the mainstay of the CTP. The therapist assisted the subjects to take alternative views of their health, disseminated information on compliance at the time of query, and moderated arguments during confrontations to focus on individual characteristics rather than on authority figures. The therapist refrained from hard selling the personal value of compliance, didactic education and direct confrontations. The progress of each session was flexible and depended on the group dynamic between the therapist and participants.

The CTP comprised five sessions, which allowed for adequate exploration and offset the possibility of mild cognitive impairment in psychotic patients (Hayward & Chan, 1995). The first session was to build rapport amongst group members, review personal conceptualization of illness and stance towards treatment. Participants were guided to share their feelings and experiences in relation to their illness. Before adjournment, they were asked to think something about themselves and discuss their thoughts at the next session, e.g., What were you thinking at the time you defaulted on compliance? What were your expectation(s) of the current hospitalization? What kind of life were you looking for? How could you stay well without good compliance? Do you think your problem(s) are unique and only happened to you, etc. Consolidation of the preceding session was made at the beginning of every session. The second session focused on discussion and examination of possible alternatives to their expressed difficulties. Health information and psychotropic drug references were disseminated naturally. They were guided to weigh the pros and cons of premature cessation of compliance. Common distress and experiences of adjusting medication against

medical advice were shared. Differentiation between symptoms and adverse drug effects was discussed to clarify misconceptions. Skills to identify prodromal symptoms were highlighted to promote their readiness to seek timely interventions and to prevent full-blown episodes. The third and fourth sessions were to examine the benefits and drawbacks of compliance in considering personal resources and constraints, e.g. cost of readmission, somatic distress, strained relationships. It took much time to face and resolve psychological conflicts towards compliance. Subjects were supported to comment on their conditions before their current admission, especially in relation to their valued relationships, jobs and personal pursuits. Through this kind of sharing, subjects might come to realize that the problems they encountered were not uncommon, which allayed the common feeling of being alone to tackle problem(s). The therapist would disseminate information about coping skills for adverse drug reactions, cues on self-medication and problem-shooting practice was shared in the session. The fifth session focused on effective skills to negotiate with healthcare workers because ineffective negotiation likely leads to misinterpretation.

RESULTS

In total, 183 male subjects stayed at the sampling setting. One hundred thirty-five subjects fulfilled the inclusion criteria and were approached. Seventeen subjects (12%) refused informed consent and forty subjects (30%) requested that they be switched to the alternate group contrary to the randomized schedule. Consequently, 78 male subjects were left and consented to join this study, giving a participation rate of 58% at the very beginning. Forty subjects (51%) were allocated to the control group and thirty-eight subjects (49%) to experimental group (Figure 2).

Attrition

Eighteen subjects withdrew from the study soon after it commenced for various reasons: eleven subjects expressed that it was unnecessary to continue, four subjects was transferred out to another unit due to mental instability, two subjects were prematurely discharged, and one subject withdrew because he had employed a private nurse for his aftercare. Eventually

30 subjects were left in the control group and 30 subjects in the experimental group to complete the in-patient rehabilitation programmes. Of these, forty-seven out of 60 subjects (78%) entirely completed the study. The attrition was 40%, which is considered as typical testing behaviour for Chinese subjects (Yang, 1997).

Demographic background

Their age ranged from 18 to 67 years old, and the median age was 36 years. The majority (80%) was single and living with family. About 20% of subjects lived alone in rented apartments, and none of them resided in a supported hostel or halfway house. Fifty-seven percent had attained a secondary education, 94% were unemployed and about 50% received CSSA. The average number of admissions was 4.5 times: ranging from new admission to 14 admissions with standard deviation of 1.17. These characteristics reflected the ongoing problems of social adjustment and lack of health enhancing behaviours (McCay, 1985). Approximately 80% of subjects had suffered from mental illness for 3 years or more. Ninety-six percent suffered from relapse. They all received neuroleptic drugs: 27 subjects (57%) with oral drugs only, and 20 subjects (43%) with both oral and depot injection. There was a significant difference between the two groups for length of stay (P=0.038) (Table 1 see appendices).

Base-line measures

The demographic profiles for a total of 47 subjects were tested with sample *t*-test and no significant difference was identified, indicating that the randomization was effective (Guyatt *et al.*, 1998) and homogeneity was assumed for both groups to a certain extent. Evidence of constant error did not exist.

RESULTS

Before intervention

The symptom scores were about 44 (s.d.~9) and 45 (s.d.~7) for the experimental and control groups respectively (Table 2 see appendices). The psychopathology of both groups was a mild to moderate degree of severity without significant between group differences (P> 0.12).

The attitude to medications (ATM) of both groups was negative without significant between-group differences (Table 3 see appendices). All participants showed partial drug compliance when evaluating pre-admission drug compliance; took approximately 50% of prescribed medication of their own volition. The between-group differences of SRDC were insignificant (Table 4 see appendices).

Outcome after intervention

Both groups had substantially improved symptom scores after hospitalization. The improved psychopathology was thought to be related to the start of drug treatment. There were no significant differences between the two groups in BPRS throughout the study (P>0.1). They still harboured mild to moderate residual symptoms. The ATM and SRDC in both groups improved to a similar degree, which lasted for 6 months (Table 3, 4 see appendices). The within-subject change in SRDC was significant in the experimental group (P<0.005) (Table 4 see appendices).

The time span between each outpatient follow-up interval for the two groups was the same (sd =0). The attendance rates of the experimental and control groups were above 90% and around 75% respectively. The control group showed a greater likelihood to default on follow-up (P= 0.009) (Table 5 see appendices). Default started right after discharge and kept deteriorating until the fourth month post-discharge. Whereas, the experimental group started to default at the second month post-discharge and maintained default at around 3.5% to 7% till the end of study. As a benchmark, the third month post-discharge could be interpreted as the turning point in forecasting follow-up compliance.

Outcome measurements were cross-tabulated. Association was identified only at the time of admission between the BPRS and the DAI-C (P=0.004), BPRS and SRDC (P=0.024). Outpatient follow-ups were associated with symptom scores (P<0.001) and ATM (P<0.05) throughout the course of study.

Demographic variables

Demographic variables were cross-tabulated, and no evidence of association was identified except illness history versus depot injection. Outcome measurements were cross-tabulated with demographic variables and no association was identified. The LOS was not associated with the FU, DAI-C, SRDC and BPRS ($P > 0.1$). No participants of this study were readmitted after discharge, thus the LOS upon readmission could not be studied.

DISCUSSION

CTP in favour of continuing treatment regime

Forty-seven subjects completed the study. The experimental group that received five sessions of CTP was less likely to default on follow-up (FU), and tended to keep a positive attitude to medication (ATM) after discharge. The substantial attrition of the control group did illustrate the effects of the CTP in favour of continuing the treatment regime, which was interpreted as the beneficial impact of using a spontaneous approach with motivational interviewing skills as adopted in the CTP.

Such an approach was useful to modify the mindset of people with mental illness to comply with the treatment regime. It was interesting to note that the follow-up became stable after the third month post-discharge. The first three months post-discharge were regarded as a critical threshold that warranted our effort to enforce the post-discharge rehabilitation, e.g., after-care, extended service or community support.

Partial drug compliance common in self-medication regimes

Partial drug compliance has been shown to be a universal phenomenon in self-medicated treatment for illnesses such as mental illness and diabetic mellitus (Ruscher, de Wit & Mazmanian, 1997; McClellan & Cowan, 1970) ranging from 50% to 75% (Cramer, 1998; Hornung et al., 1998). All subjects in this study still harboured mild to moderate residual symptoms indicating long-term drug treatment was essential. For subjects receiving depot injections, most relied on

the depot injection, which to a certain extent secured the drug's effect on their psychosis. Following this result, depot was recommended as a prudent strategy to prevent relapse, especially for people with a high risk of drug default. The negotiation between clients and doctor about depot and oral medication could be treated as a trade off to secure adequate drug effect. This study did not examine the adverse effect, group and dose of neuroleptic, so that the level of desirable pharmacological level was not available. In Kemp et al., (1996), the dose of medication showed a reduction over 6 months of follow-up along with stable mental state.

The symptom scores did not correlate with ATM and drug compliance except for the follow-ups. ($P < 0.05$). The common understanding that improved ATM might enhance drug compliance because of improved psychopathology and secure follow-ups, needs further verification. Questions were raised about (1) the sensitivity and specificity of DAI-C and SRDC to BPRS, and (2) the association between different factors, which require exploring or formulating more comprehensive models and far-reaching approaches to analyze.

Implications

Are these findings generalizable? Around 40% of eligible samples refused to enter the study and 40% dropped out. Nevertheless, these figures could be offset by the randomized single-blinded design. The CTP was found effective to promote ATM and FU for 6 months even under partial drug compliance. The cost incurred in CTP was affordable as routine practice and is warranted to motivate clients to comply with their treatment regimes.

Limitations

Because of several uncontrollable factors, caution should be exercised in the interpretation of results. Firstly, 30 recruited subjects refused CTP and requested that they switch to the control group against randomized allocation. They might either be patients with treatment-resistant mental illness or vulnerable to relapse such that they required additional intensive care, but the investigator was not allowed to examine their information for analysis. This might have

impaired the power of generalizability. Secondly, the effect of CTP relied on the personal competency of the investigator to practice motivational interviewing skills. Owing to the constraints of the quantitative approach, the investigator was restrained from exploring the reasons for partial compliance and the corresponding measures they took.

In order to obtain ethical approval more easily, the researchers had to forgo studying female subjects. Confounding factors such as drug dosage, adverse drug effects and social supports were not studied, which decreased the richness of the current findings. Nonetheless, this study adopted a randomized single-blind design to reduce the impacts of faulty design that consequently decreased the accessible sample size.

CONCLUSIONS

The CTP was a pragmatic approach to improve ATM, which secures post-discharge compliance with medication and outpatient follow-up for six months. It was the first study that translated the DAI (Awad et al., 1997) and part of the SRDC (Adams & Howe, 1993) to a Chinese population according to a vigorous translation process. The results enable followers to use the translated instrument in future study. It warrants further exploration of its applications and improvements of its effectiveness. The findings provide valuable experience and materials for followers to pursue.

Future study should integrate relevant conceptual models with expert support to refine the CTP before it is applied across different psychiatric settings and institutions to justify its wider application with a larger sample size. It would be better to extend the time frame for longitudinal evaluation to years or longer to justify its long-term effects. The post-discharge assessment interval should be monthly to enhance sensitivity to mental fluctuation. Cluster analysis is suggested to refine specificity of symptom scores about mental illness. It is desirable that frontline healthcare workers be equipped with motivational interviewing skills.

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治疗依从训练计划对中国男性精神分裂患者的效应

预防复发、症状控制及痊愈皆与治疗方案的依从有关联。研究发现运用动机晤谈技巧作心理教育对依从性提高有效达两年之久。本研究为一前瞻性实验研究采用了单盲随机设计去探讨治疗依从训练计划对中国精神分裂患者的效用。利用随机数表，将四十七位被招募男性精神分裂患者分配到实验组或控制组。控制组接受常规治疗；实验组则接受常规治疗外再加治疗依从训练。所有对象都接受一系列包括有简易精神科症状评估量表、药物态度量表(中文版)及药物服用依从自我报告的前试评估。刚出院时又会再作一次简易精神科症状评估。一名独立评估员会采用同一系列量表在出院后第三个及第六个月测试介入效应。门诊覆诊纪录也是追纵资料。最后两组都在住院时展现相近的症状改善得分。实验组在覆诊依从表现较好(P<0.05)。对象中能够维持三个月覆诊者会有较大机会有持续依从性。治疗依从训练计划至少对门诊病人的覆诊依从有六个月的改善。
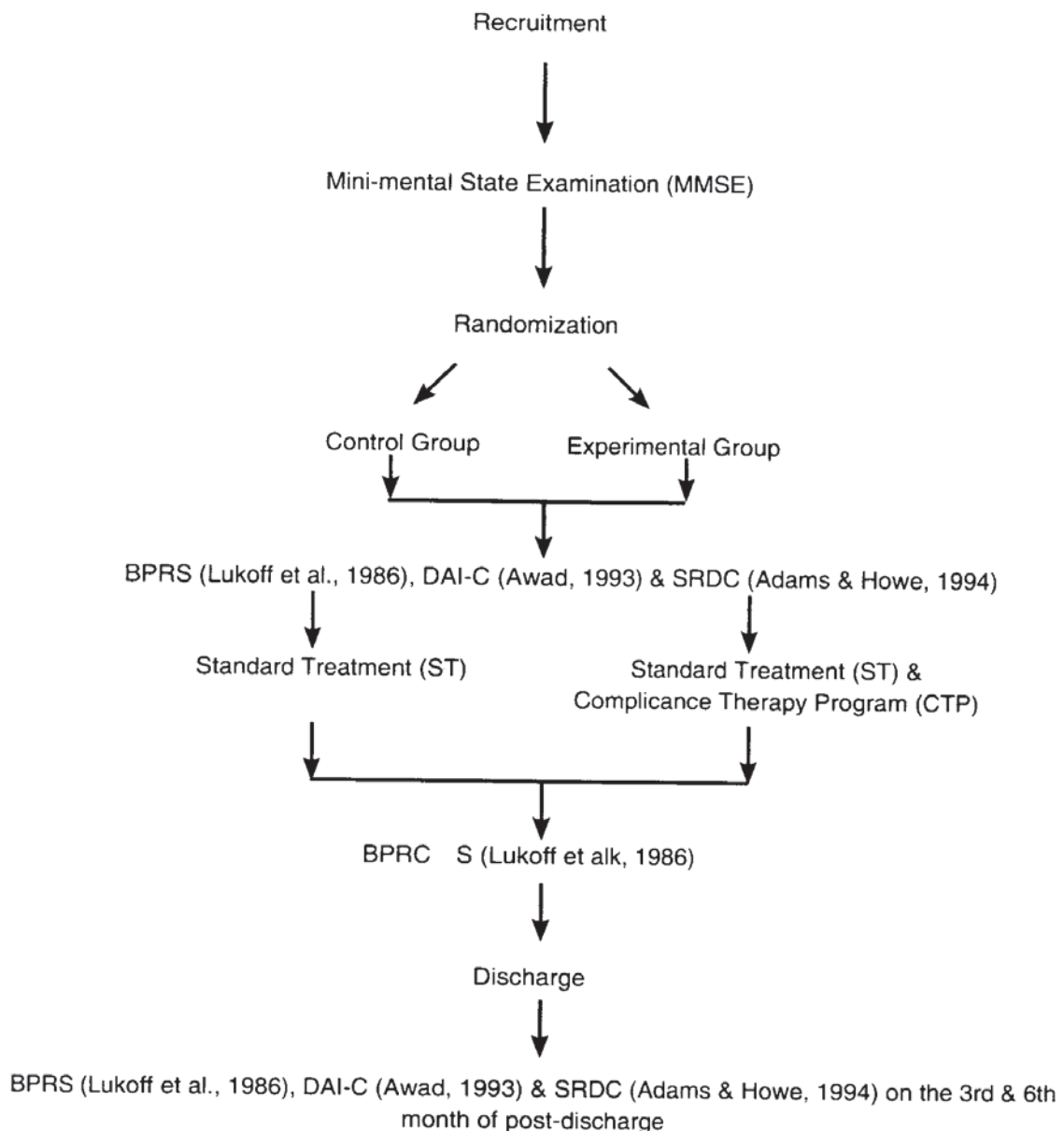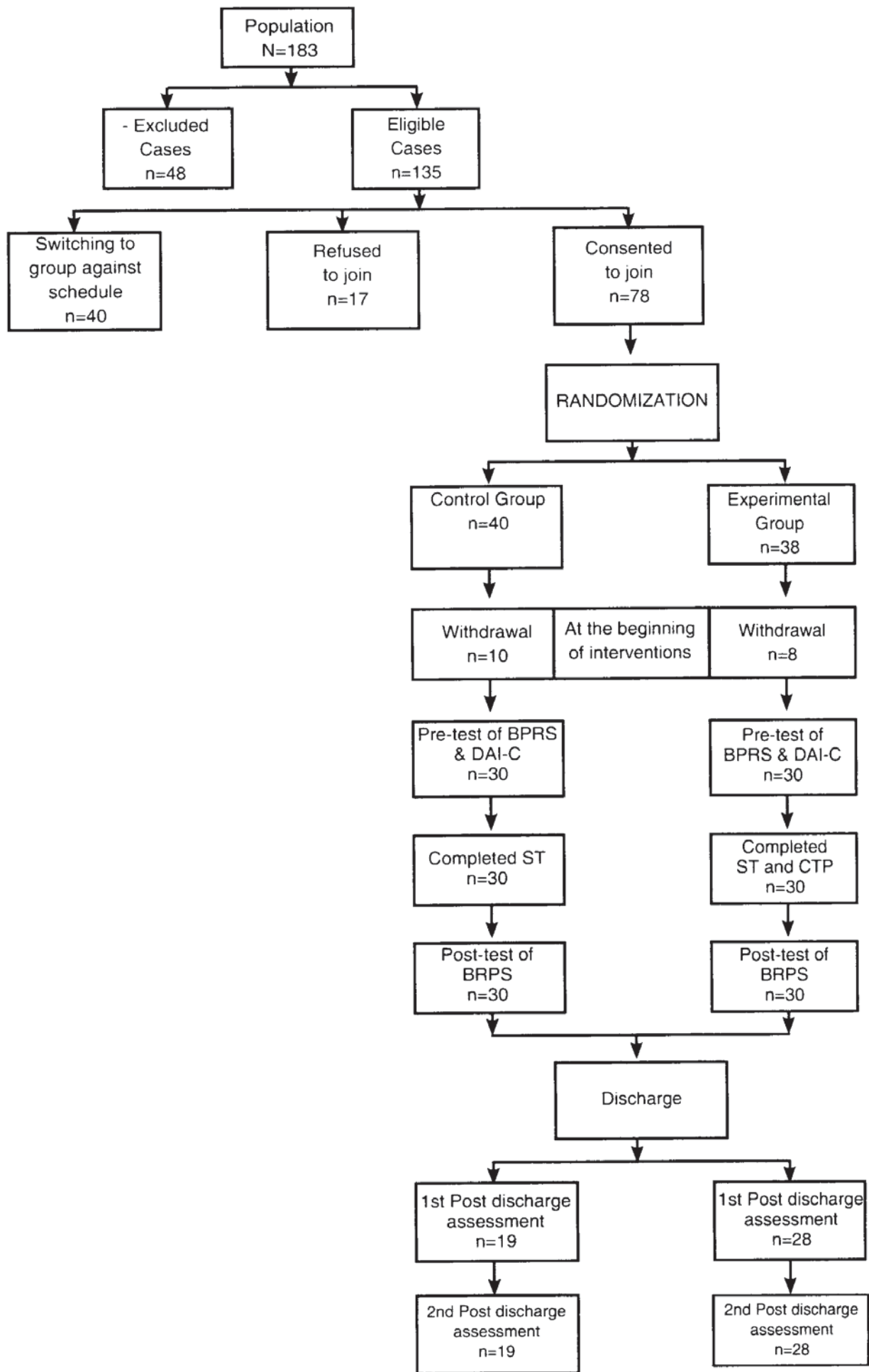
摘要

Figure 1 Research Design

Figure 2. A summary of randomized single blinded trial of this study

Table 1. Characteristics of experimental group and control group

Characteristics		Control n=19 (%)	Experimental n=28 (%)	Chi-square	p-value
CMMSE scores	Mean (SD)	25.16 (1.21)	24.93 (1.05)	0.810	0.494
Age group	Mean age (SD)	39 (11)	36 (11)	-1.114	0.271
Education	Primary Secondary	8 (42) 11 (58)	12 (43) 16 (57)	-0.050	0.960
Marital Status	Single Married Divorced	16 (84) 3 (16)	24 (86) 3 (10) 1 (4)	-0.139	0.890
Religious belief	Yes No	5 (26) 14 (74)	7 (25) 21 (75)	-0.099	0.921
No. of admission(s)	< or = 5 times > 5 times	10 (53) 9 (47)	22 (77%) 6 (23)	-0.793	0.432
Length of stay	< 3 months > 3 months	16 (84) 3 (16)	14 (50) 14 (50)	2.141	0.038
Living Alone	Yes No	4 (21) 15 (79)	4 (14) 24 (86)	0.595	0.555
Receiving CPNS	Yes No	4 (21) 15 (79)	6 (21) 22 (79)	-0.030	0.976
Receiving CSSA	Yes No	10 (53) 9 (47)	17 (61) 11 (39)	-0.540	0.592
Employment	Employed Unemployed	2 (10) 17 (90)	1 (4) 27 (96)	-0.946	0.349
Day Hospital	Yes Nil	1 (5) 18 (95)	3 (11) 25 (89)	-0.646	0.522
Neuroleptics	Yes No	17 (90) 2 (10)	24 (86) 4 (14)	0.371	0.712
Depot injection	Yes Nil	13 (68) 6 (32)	15 (54) 13 (46)	1.007	0.319
History of Mental Illness	<3 years 3 to 10 years > 10 years	3 (16) 8 (42) 8 (42)	7 (25) 8 (29) 13 (46)	0.104	0.918

The value indicates the actual number of subjects unless stated otherwise. CMMSE score denotes Cantonese Mini Mental State Examination score. CPNS denotes community psychiatric nursing services. CSSA denotes Comprehensive Social Security Assistance.

Table 2. Brief Psychiatric Rating Scale (BPRS) Scores

Test of BPRS	Experimental group	(SD)	Mean rank	Control group	(SD)	(n=19) Mean rank	Mann- Z	Whitney U- test p-value
	Mean (n=28)			Mean				
T1	43.9	(-8.72)	3.93	44.84	(-7.27)	4.00	-0.48	0.633
T2	32.54	(-4.57)	2.02	31.11	(-5.47)	1.68	-1.57	0.116
T3	32.25	(-4.44)	1.95	31.47	(-6.35)	2.00	0.137	0.137
T4	32.36	(-4.4)	2.11	32.00	(-6.2)	2.32	0.319	0.319

BPRS denotes Brief Psychiatric Rating Scale. T denotes trial of assessment.

T1 denotes pre-test. T2 denotes 1ˢᵗ post-test. T3 denotes 2ⁿᵈ post-test.

T4 denotes 3ʳᵈ post-test. The value indicates mean unless stated otherwise.

Table 3. Drug Attitude Inventory - Chinese Scores

Test of DAI-C	Experimental group n=28		Control group n=29		Mann-Whitney U-test	
	Mean	SD	Mean	SD	Z	p-value
T1	-3.50	3.50	-3.26	3.14	-2.87	P=0.77
T2	1.36	3.54	0.21	3.70	-1.30	P=0.20
T3	1.36	3.90	-0.84	4.02	-2.10	P=0.04
	Mean rank		Mean rank			
T2 - T1	26.54		20.26		-1.56	P=0.12
T3 - T1	28.07		18.00		-2.50	P=0.01
Wilcoxon Signed - rank test	Z	p-value	Z	p-value		
T2 - T1	-4.53	P<0.001	-3.60	P<0.001		
T3 - T1	-4.52	P<0.001	-3.21	P<0.001		

DAI-C denotes drug attitude inventory-Chinese. T denotes trial of assessment.

T1 denotes pre-test. T2 denotes 1ˢᵗ post-test. T3 denotes 2ⁿᵈ post-test.

The value indicates mean unless stated otherwise.

Table 4. Self-Reported Drug Compliance (SRDC) Scores

Test of SRDC	Experimental group n=28 Mean rank	Control group n=19 Mean rank	Mann-Whitney U test z	p=value
T2-T1	25.20	22.30	-0.75	0.46
T3-T1	26.20	20.80	-1.37	0.17

Wilcoxon Signed-rank test	z	p-value	z	p-value
T2-T1	-4.23	P<0.001	-2.84	P<0.005
T3-T1	-3.87	P<0.001	-2.30	P<0.05

SRDC denotes self-report drug compliance. T denotes trial of assessment.

T1 denotes pre-test. T2 denotes 1st post-test. T3 denotes 2nd post-test.

Table 5. Ccompliance of follow-up at designated clinics

Follow-ups	Experimental group (N=28) Attended n (%)	Control group (N=19) Attended n (%)	Fisher's X^2	Exact test p-value
1	28 (100)	18 (94.74)	1.506	0.404
2	27 (96.43)	17 (89.47)	0.916	0.557
3	26 (92.86)	15 (79.01)	1.967	0.204
4	27 (96.43)	14 (74.00)	5.258	0.033
5	26 (92.86)	14 (74.00)	3.283	0.102
6	26 (92.86)	14 (74.00)	3.283	0.102
Cochran test Cochran'Q	3.85	15.33		
p-value	0.57	0.01		

FU denotes outpatient follow-ups. The serial number of FU indicates the sequence of post-discharge outpatients follow-ups. The value indicates actual number of subjects unless stated otherwise.

Appendix 1

Chinese version of Drug Attitude Inventory

藥物意見目錄

敬啓者

此問卷分兩部份，請你閱讀以下問題，並在你認爲正確的答案方格內劃上✓號

	對	錯
一) 對我來說，服藥的益處遠大於害處。	❏	❏
二) 藥物令我感覺古怪，仿佛像個僵屍。	❏	❏
三) 服藥與否取決於我的意願。	❏	❏
四) 藥物令我更感輕鬆舒暢。	❏	❏
五) 藥物令我感到疲倦遲鈍。	❏	❏
六) 我祇會在感到不適時才服藥。	❏	❏
七) 服藥令我更感正常。	❏	❏
八) 以藥物控制我的身心是不自然的。	❏	❏
九) 藥物令我頭腦更清晰。	❏	❏
十) 保持服藥能令我預防病發。	❏	❏