



# Does Treatment Adherence Therapy reduce expense of healthcare use in patients with psychotic disorders? Cost-minimization analysis in a randomized controlled trial

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## ABSTRACT

**Background:** Adherence interventions in psychotic disorders have produced mixed results. Even when an intervention improved adherence, benefits to patients were unclear. Treatment Adherence Therapy (TAT) also improved adherence relative to Treatment As Usual (TAU), but it had no effects on symptoms or quality of life. TAT may or may not reduce healthcare costs.

**Aim:** To determine whether TAT reduces the use of healthcare resources, and thus healthcare costs.

**Method:** Randomized controlled trial of TAT versus TAU with 98 patients. Interviews were conducted at baseline (T0), six months later, when TAT had been completed (T1) and at six-month follow-up (T2). We have used admission data and part of the Trimbos/iMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P). We compared total costs in the TAT group with those in the control group with the help of multivariate analysis of covariance.

**Results:** TAT did not significantly minimize total costs. In the TAT group, the mean one-year health-treatment cost per patient (including TAT sessions) was € 23 003.64 (SD = 19 317.95), whereas in the TAU group it was € 22 489.88 (SD = 25 224.57) ( $F(1) = .652, p = .42$ ). However, there were two significant differences at item-level, both with higher costs for the TAU group: psychiatric nurse contacts and legal proceedings for court-ordered admissions.

**Conclusions:** Because TAT did not reduce total healthcare costs, it did not contribute to cost-minimization. Its benefits are therefore questionable. No other adherence intervention has included analysis of cost-effectiveness or cost-minimization.

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## 1. Introduction

Patients with schizophrenia are often non-adherent (Lacro et al., 2002), even though adherence to antipsychotic medication is critical to reducing their risk of relapse and enhancing their long-term functional outcome (Masand and Narasimhan, 2006; Ascher-Svanum et al., 2009). Relapse and hospitalization are costly (Gibson et al., 2004; Ascher-Svanum et al., 2010). If both were reduced, healthcare costs for patients with schizophrenia would be lower. One of the best ways of achieving this might be through better treatment adherence.

Attempts to improve treatment adherence have shown that therapy programs relying on psycho-education are typically ineffective (Zygmunt

et al., 2002; Dolder et al., 2003). Other interventions have been developed, such as behavioral strategies and interventions based on cognitive behavior therapy (Gray et al., 2002). The latter kind, such as compliance therapy, seems more likely to enhance compliance effectively (Kemp et al., 1996; Kemp et al., 1998). This is in line with Zygmunt et al. (2002), who found that interventions that specifically target non-adherence were more likely to be effective than more broadly based strategies.

Two problems were particularly inherent to previous attempts to improve adherence:

- (1) not all studies and their replications produced significant effects (Staring et al., 2010); and
- (2) even though effective interventions for adherence may greatly reduce costs – for example by preventing readmissions – the effects on treatment costs were never analyzed.

One new intervention is Treatment Adherence Therapy (TAT), in which strategies for improving adherence are tailored to a patient's

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individual situation (Staring et al., 2006). A rater-blind randomized controlled trial that compared TAT with Treatment As Usual (TAU) found that service engagement (Cohen's  $d = 0.48$ ) and medication compliance (Cohen's  $d = 0.43$ ) were improved more successfully by TAT than by TAU. There was also a trend whereby fewer patients were admitted involuntarily (1.9% versus 11.8%,  $p = 0.053$ ). However, there were no observable effects on symptoms or quality of life (Staring et al., 2010). This raises the question of whether TAT is still useful.

Damen et al. (2008) found that with a 15% in compliance with antipsychotics, 0.5 relapses are prevented and patients spend 22 fewer days in hospital over 5 years. In addition, Marcus and Olfson (2008) found that improving adherence with antipsychotics could lower the number of acute care admissions, reduce the number of inpatient treatment, resulting in a savings of approximately \$106 million in inpatient care costs. Sun et al. (2007) found the same, poor adherence was consistently associated with higher risk of relapse and rehospitalisation and higher hospitalization costs.

So, even though symptoms and quality of life did not improve, TAT may nonetheless reduce the use of healthcare resources by achieving results such as shorter hospital stays. If the concomitant reduction in costs is greater than the cost of TAT itself, the intervention may have a net positive effect on the financial burden to society incurred by non-adherent patients with psychotic disorders. This would make the intervention worthwhile. Besides possible cost benefits for society, prevention of hospital admissions is also desirable for patients. Even though they may not live independently and have to move to sheltered or accompanied housing, this is still better than living in a psychiatric hospital. Patients may live a more stable and independent life in sheltered housing, e.g. more possibilities to meet friends and family, as well as to work or otherwise engage in activities outside of their homes.

On the basis of the randomized controlled trial specified above, we therefore assessed whether TAT would help minimize the costs of healthcare use.

## 2. Method

### 2.1. Study population

Patients were already participants in a multi-center randomized controlled trial investigating the effects of Treatment Adherence Therapy (TAT) in Holland's greater Rotterdam region (Staring et al., 2010). Inclusion criteria were (1) a DSM-IV diagnosis of schizophrenia or schizoaffective disorder, (2) receiving outpatient treatment, (3) being a speaker of Dutch, and (4) having at least some problems with service engagement, as defined by an average item-score of 1.25 or higher on at least two subscales of the Service Engagement Scale (SES) (Tait et al., 2002).

### 2.2. Design and procedure

Respondents were randomized into two groups. One group received TAT (TAT group), the other TAU (TAU group). Interviews were conducted at baseline before TAT started (T0), after six months, at the end of TAT (T1), and at sixth-month follow-up (T2). Structured interviews were performed by medical and psychology students; questions to respondents included some on patients' use of healthcare resources. Their answers provided the core data for this article. Data on length of stay in a psychiatric hospital were collected from the medical records. For more details of the RCT, see Staring et al. (2010).

### 2.3. Treatment Adherence Therapy (TAT)

Treatment Adherence Therapy was based on an empirical–theoretical model in which patient-determinants of non-adherence were clustered into three groups, each of which could be targeted by one of the following treatment modules: Motivational Interviewing, Medication Optimization,

and Behavioral Training. The TAT sessions were provided by psychiatric nurses, who were not involved in the regular treatment of the patients, and who gave TAT in addition to TAU. They received four days of training and an hour of supervision every two weeks thereafter. To ensure treatment fidelity, all sessions were recorded and used in supervision. Recordings were often used to check and maintain the relevant therapeutic skills. No significant problems were encountered and the therapists were found to be compliant with the instructions given. For the execution of TAT, no additional office space or other materials were required. For a more detailed description of TAT, see Staring et al. (2006; 2010).

## 2.4. Measurements

### 2.4.1. Use of healthcare

To measure the use of healthcare resources, we used a questionnaire based on the Trimbos/iMTA questionnaire for Costs associated with Psychiatric Illness (TiC-P). The TiC-P consists of two questionnaires which can be used separately, one measuring medical consumption, the other assessing costs on the basis of loss of productive activity, i.e. not being able to work (Hakkaart-Van Roijen et al., 2002). Because unemployment rates were expected to be continuously high in all patients, with little chance of actual change, we used only the medical consumption questionnaire.

Respondents reported on the use of health services. The recall period was established at four weeks, a relatively short period to prevent underreporting and mistakes (Hakkaart-van Roijen et al., 2002). To calculate the costs, we presumed that these four weeks were representative of the period between two individual assessments; six-month periods. To estimate health service use over such a period, we multiplied the frequencies within these four weeks by 6.52. Because we expected length of stay in a psychiatric hospital to be the most important cost item, the number of days in psychiatric hospital was not based on patient reports, but instead derived from the medical records. We did not derive all healthcare use from the medical records, the main reason for which is that in healthcare facilities the identification of healthcare utilization data on a single patient may require considerable effort and involve significant error. Locating all the medical records on a patient for care provided by different healthcare facilities (e.g. different psychiatric services, general practitioner, other services) may be problematic (Roberts et al., 1996). Often, there are no complete medical records for these patients, because computerized data on utilization is not available in the Netherlands. Next to this, Roberts et al. (1996) found that self-reported healthcare use over a short period is reasonably accurate. It must be assumed that underreporting will be greater the longer the recall period used (Andersen and Mikkelsen, 2008). Therefore, our recall period was established at four weeks.

### 2.4.2. Costs

Costs in this economic evaluation included (1) direct medical costs in healthcare, and (2) direct and (3) indirect costs outside healthcare. For all participating patients, the relevant costs within these three categories were obtained at the three assessment points of the study (T0, T1, and T2).

To establish the unit cost of each service, we used the 'manual for medical cost research' (Oostenbrink et al., 2004). To establish the unit costs of a psychologist or a psychiatric nurse, the costs for a regular face-to-face contact in adult outpatient care were used. As the manual did not include some of the service costs, various alternative sources were used (Table 1).

Costs were calculated by multiplying the summed number of resource volumes by their respective unit costs. We derived unit costs for 2008 from the specific annual price indices published in the Netherlands (Statistics Netherlands, 2010). Although the survey was conducted between March 2005 and September 2009, most respondents were interviewed in 2008. We therefore calculated the prices of

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