



ORIGINAL ARTICLE

## Cost-effectiveness of therapeutic interventions in schizophrenia

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### KEYWORDS

Schizophrenia;  
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Cost-effectiveness;  
Decision tree

### Abstract

**Background:** Various studies have reported that a decision-tree analysis is useful to evaluate different treatment strategies in real clinical practice.

**Objective:** The main aim of this study was to research the clinical decisions regarding the treatment of patients who were diagnosed with schizophrenia.

**Method:** Cost-effectiveness study of three different interventions to treat patients with schizophrenia were studied. Interventions were divided into the following categories: a) day hospital (psycho-educational treatment + psychiatric consultation + psychopharmacological treatment); b) therapy adherence clinic (psychopharmacological treatment with depot antipsychotic medication + psychiatric consultation); c) outpatient psychiatric care (psychopharmacological treatment + psychiatric consultation). For this purpose decision tree model was designed and three outcomes were measured (therapeutic compliance, non-compliance and rehospitalization). TreeAge software was used in order to estimate outcome probabilities and sensitivity analysis, distribution Beta for probabilities and Gamma for cost of interventions. **Results:** The probability of therapeutic compliance and average semestral cost of therapy adherence clinic, outpatient psychiatric care and day hospital are 0.594, 0.284, 2.393, and mean cost intervention US\$ 2145.6, US\$ 700.2 and US\$ 1412.1 respectively (IC95%), according to Montecarlo analysis.

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**Conclusions:** According to the results, the clinical decision to treat patients in therapy adherence clinic improved therapeutic compliance, but the cost of treatment was higher. There were extra costs and risks to society and patient that are associated with therapeutic non-compliance. It is less expensive for the health care system to provide the patients outpatient psychiatric care, but perhaps in the long-term outpatient psychiatric care is more costly for the patient, their family, and society. According to the many important limitations of this study, further studies are needed to reject/confirm these strategies to be included in real clinical practice.

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## Background

Schizophrenia (SCH) is a chronic mental disorder, which may start in childhood. This implies high direct and indirect costs of the disease in patient's life. Worldwide, the lifetime prevalence of schizophrenia is about 0.3–0.7%.<sup>1</sup> In Mexico, estimated lifetime prevalence is 0.7%.<sup>2</sup>

The lack of therapeutic compliance in SCH increases the risk of relapse. This implies a greater number of relapses, suicides, serious self-inflicted wounds, and an increase in the demand of outpatient psychiatric care and hospitalizations, which increase the overall costs of the disease. The term 'therapeutic compliance' refers to when the patient follows the physician's recommended treatment, and 'non-compliance' refers to when there is a difference between what is recommended by the physician and what is taken by the patient. These terms have replaced the term 'adherence', in order to emphasize the role of the patient.<sup>3</sup> Evidence indicates that compliance reduces the risk of relapse; however, some reports show that the rate of therapeutic non-compliance is between 20% and 89%, with an average of 50%.<sup>4</sup> The rates of therapeutic non-compliance in controlled situations is reduced to 11–33%, and rises up to 37–57% in uncontrolled situations.<sup>5</sup> Another report shows that only 20% of patients with good therapeutic adherence had relapses, compared to 42% of patients who demonstrated poor treatment, which also resulted in more prolonged hospitalization periods.<sup>6</sup> In the CATIE study of 18 months, treatment discontinuation was 74% in the first phase. In that study, patients treated with second-generation antipsychotics had better adherence to treatment, but there was no statistically significant difference when compared to perphenazine.<sup>7</sup> The risk of rehospitalization is directly linked to therapeutic non-compliance: interruptions in the treatment increase the risk of rehospitalization, with an odds ratio (OR) of 1.98 when treatment is interrupted from 1 to 10 days, 2.81 OR with interruptions of 11–30 days, and 3.96 OR with periods longer than 30 days.<sup>8</sup>

Studies have reported that a decision-tree analysis is useful to evaluate different treatment strategies based on results, probabilities and costs.<sup>9,10</sup> Thus, a decision tree analysis reported an increase in the cost of olanzapine compared to haloperidol (\$3424.6 USD) in patients who had shown improvement, and \$13801.2 USD to prevent relapse in patients. In that study, improvement was evaluated using the BPRS (Brief Psychiatric Rating Scale).<sup>11</sup> In

Slovenian decision tree analysis in duration of 12 months, where different treatment strategies were used for acute SCH, treatment with risperidone was less expensive, while olanzapine and risperidone were more cost-effective, even more than aripiprazole, paliperidone and quetiapine. The price of treatment per year were as follows: €6812 for risperidone, €7509 for quetiapine, €7295 for olanzapine, €8229 for aripiprazole and €8044 for paliperidone in 2011.<sup>12</sup>

The main aim of the present study was to develop a decision tree model based on the three different alternatives for treatment of patients diagnosed with schizophrenia in a public hospital, and to evaluate options in terms of cost and therapeutic compliance.

## Methods

A cost-effectiveness study; diagnosis was performed by psychiatrists. The selected patients met the criteria for schizophrenia according to the International Classification of Diseases (ICD-10). To maximize the reliability of the data, only the diagnosis of schizophrenia (F20) was considered. Other psychoses such as schizotypal disorder (F21), persistent delusional disorder (F22), acute psychotic disorder (F23), induced delusional disorder (F24) and schizoaffective disorder (F25) were excluded, because these disorders have a different clinical course to schizophrenia and consequently the demand for health services is different. This investigation was approved by The Ethics and Research Committee of the hospital, which is regulated by the Mexican Health Law.

## Services types and therapeutic interventions.

In the Psychiatric Hospital "Fray Bernardino Álvarez" there are three interventions to treat patients with SCH; these alternatives are: a) day Hospital (psycho-educational treatment + psychiatric consultation + psychopharmacological treatment); b) therapy adherence clinic (psychopharmacological treatment with depot antipsychotic medication + psychiatric consultation); c) outpatient psychiatric care (psychopharmacological treatment + psychiatric consultation). Each alternative was used as single branch in the final model structure.

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