Assessing cost-effectiveness in mental health: family interventions for schizophrenia and related conditions

Mihalopoulos C, Magnus A, Carter R, Vos T

Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
Three family interventions for the treatment of patients with schizophrenia and related conditions were examined. The interventions were behavioural family management (BFM), behavioural intervention for families (BIF), and multiple family groups (MFG). BFM comprised the sequential steps of assessment, psychoeducation, communication skills training, and problem-solving training. Families were seen weekly for 3 months, then fortnightly for 6 months, and monthly thereafter. BIF was similar to BFM, but was less intensive. It consisted of 2 sessions of psychoeducation, 3 sessions of stress management, and 8 sessions of goal setting. MFG included a minimum of 3 sessions of family engagement (usually individual contact), 2 to 3 sessions of psychoeducation, regular fortnightly sessions for 2 years and regular monthly meetings thereafter. MFG consisted of several patients, their families, and 2 clinicians.

Type of intervention
Treatment.

Economic study type
Cost-utility analysis and cost-effectiveness analysis.

Study population
The study population comprised a cohort of patients aged less than 65 years, who were suffering from schizophrenia and related conditions and who had ongoing regular contact with relatives or family members. People who only had contact with children were excluded.

Setting
The setting was secondary care. The economic study was carried out in Australia.

Dates to which data relate
The effectiveness data were derived from studies published in 1999 and 2001. The dates when the resource use data were collected were not reported. The price year was not given.

Source of effectiveness data
The effectiveness evidence was derived from a synthesis of published studies and authors' assumptions.

Modelling
A Markov model was constructed to examine the impact of the family interventions on costs and outcomes associated with patients suffering from schizophrenia and related conditions. The time horizon of the model was 10 years and 1-year cycles were considered. At the end of each cycle, the patients could remain alive with schizophrenia, remit from schizophrenia, or die.
Outcomes assessed in the review
The outcomes derived from the literature were:

disease prevalence,
the disability weight (DW) associated with schizophrenia,
the odds ratio of relapse reduction due to the intervention in comparison with no treatment, and
the number-needed-to-treat to avert a relapse.

Survival data were obtained from Australian life tables and were not reported.

Study designs and other criteria for inclusion in the review
It was not stated whether a systematic review of the literature was undertaken.

Sources searched to identify primary studies
Not stated.

Criteria used to ensure the validity of primary studies
Not stated.

Methods used to judge relevance and validity, and for extracting data
Not stated.

Number of primary studies included
Three primary studies provided the evidence.

Methods of combining primary studies
The primary estimates appear to have been combined using narrative methods.

Investigation of differences between primary studies
Not stated.

Results of the review
The rate of prevalence was not reported. However, the authors stated that 75% of individuals were in a better state and 25% of patients were in a worse state.

The proportion of male and female eligible individuals was reported according to age group. It ranged from 100% (both for women and men) at age less than 20 years to 29% (men) and 19% (women) for the age group 60 - 64 years.

The DW associated with schizophrenia ranged from 0.31 (better state) to 0.54 (worse state).

The weighted average DW was 0.371.

The odds ratio of relapse reduction due to the intervention in comparison with no treatment was 0.51 (range: 0.28 - 0.9). This was the same for the three family interventions, which were considered to be equally effective.
The number-needed-to-treat to avert a relapse was 6.5 (range: 4 - 14).

**Methods used to derive estimates of effectiveness**
The authors made some assumptions that were used in the decision model.

**Estimates of effectiveness and key assumptions**
It was assumed that the compliance rate was 68% (range: 50 - 85) and that the benefits of the family interventions lasted 5 years (with 20% yearly reductions after the 5 years). The remission rate was 1.5% (range: 1 - 2).

**Measure of benefits used in the economic analysis**
The summary benefit measures used were the number of disability-adjusted life-years (DALYs) and the reduction in the relapse rate. The DALYs were derived using the modelling approach, while the method used to convert the clinical outcome into DW change was described. In particular, the DIP-DIS scores found in an earlier survey were used as an estimate of functional disability. It was assumed that these scores changed linearly with the Dutch Disability Weights for schizophrenia. Then, the best DIP-DIS score (0) was anchored to the best DW for schizophrenia (0.36) and conversely the worst DIP-DIS score to the worst DW (0.97). The reduction in the rate of relapse was derived directly from the literature. An annual discount rate of 3% was applied to the DALYs, owing to the long timeframe of the analysis.

**Direct costs**
Discounting was carried out because the costs were incurred during more than 2 years. Thus, a 3% discount rate was applied to future costs. The unit costs were presented separately from the quantities of resources used for all items. The health services included in the economic evaluation were contacts with psychologists, taking into consideration the number of contacts and the proportion of eligible population who comply. Non-compliers were assumed to increase costs. Cost-offsets, as well as out-of-pocket costs to families, were not considered in the analysis. The cost/resource boundary of the government appears to have been used in the analysis of the direct costs. A senior clinical psychologist in the public sector delivered the intervention. Resource use was mainly derived from authors' assumptions. The source of the costs was not reported. The price year was not explicitly given.

**Statistical analysis of costs**
The costs were treated deterministically.

**Indirect Costs**
Time spent by the patients and their families or caregivers was considered in the analysis. It was estimated using an estimated hourly wage rate as a proxy for the value of time. Resource use and unit costs were derived from assumptions and were reported. The costs were discounting at an annual rate of 3%, as for the analysis of the direct costs. The price year was not reported.

**Currency**
Australian dollars (Aus$).

**Sensitivity analysis**
Multivariate probabilistic sensitivity analyses were conducted to deal with uncertainty associated with the use of multiple sources of data. Most of the model inputs were given a probabilistic distribution and were varied simultaneously. In particular, uncertain parameters were assumed to be characterised by the following distributions:

uniform for the prevalence rates of psychosis, remission rate, compliance, and years of benefit enjoyed;
normal for the cost of the interventions and the cost of non-compliers;

triangular for the number-needed-to-treat and odds ratio of the interventions.

Uncertainty intervals (UIs) for the estimated incremental cost-effectiveness ratios were estimated. The discount rate for both the costs and benefits was varied from 0 to 7%.

**Estimated benefits used in the economic analysis**
Using an annual discount rate of 3%, the estimated DALYs averted with the three family interventions in comparison with no intervention were 1,990 (95% UI: 700 - 3,800). The use of alternative discount rates did not change the results substantially.

**Cost results**
Using an annual discount rate of 3%, the estimated total costs (in millions) were Aus$48 (95% UI: 32 - 68) with BFM, Aus$ 13 (95% UI: 9 - 18) with BIF, and Aus$36 (95% UI: 23 - 52) with MFG. The use of alternative discount rates did not change the results substantially.

**Synthesis of costs and benefits**
Incremental cost-utility and cost-effectiveness ratios were calculated to the combine costs and benefits of the three family interventions with the "no-treatment" option.

The incremental cost per DALY averted relative to no treatment (3% discount rate) was Aus$28,000 (95% UI: 13,000 - 64,000) with BFM, Aus$8,000 (95% UI: 4,000 - 18,000) with BIF, and Aus$21,000 (95% UI: 10,000 - 53,000) with MFG.

Variations in the discount rate produced only minor changes in the estimated cost-utility ratios.

The incremental cost per relapse averted was Aus$22,000 (95% UI: 12,000 - 34,000) with BFM, Aus$8,000 (95% UI: 5,000 - 13,000) with BIF, and Aus$10,000 (95% UI: 6,000 - 17,000) with MFG.

**Authors’ conclusions**
All family interventions for patients with schizophrenia and related conditions provided a cost-effectiveness ratio well below the standard threshold of Aus$50,000. Therefore, all of them provided good value for money in the Australian health care setting.

**CRD COMMENTARY - Selection of comparators**
The selection of the comparator was appropriate since no treatment reflected the current practice in most Australian settings. The interventions under evaluation were selected because they represented three widely recommended options for the treatment of patients with schizophrenia and related conditions. You should decide whether they are valid comparators in your own setting.

**Validity of estimate of measure of effectiveness**
The effectiveness evidence came from published evidence and authors’ assumptions. Most of these data were then varied in the sensitivity analysis, owing to the uncertainty surrounding them. The authors discussed the choice of some estimators. A review of the literature was presumably not carried out and the primary studies were identified selectively. Limited information on the design and patient samples was provided. The authors noted that the quality of the evidence used in the model was weak because of the lack of well-conducted studies.
Validity of estimate of benefit of measure of benefit
The benefit measure was selected so as to reflect the impact of the interventions on the most important aspect of patient health, namely disability. Although DALYs are not as common as quality-adjusted life-years, they were appropriately selected as a summary benefit of the interventions under evaluation. The method used to elicit the impact of the interventions on disability was described and justified, although the authors reported the difficulties associated with the conversion of a dichotomous outcome in health-related quality of life. Discounting was applied because of the long timeframe of the analysis.

Validity of estimate of costs
The authors selected a broad perspective to analyse the costs. It appears that all the relevant categories of costs have been included in the analysis. Most of the economic data used in the model were derived from authors' assumptions, which were then investigated in the sensitivity analysis. Similarly, the discount rate was applied and the impact of varying it was investigated. The costs were treated deterministically in the base-case, but probabilistic distributions were attributed to some key cost categories. The costs were estimated in a hypothetical cohort of Australian individuals, but the actual size of the cohort was not reported. The price year was not reported, which makes reflaction exercises in other settings difficult.

Other issues
The authors did not make extensive comparisons of their findings with those from other settings. The issue of the generalisability of the study results to other settings was not explicitly addressed, which affected the external validity of the analysis. The authors also noted that evidence for the actual implementation of family interventions was not definitive and some organisational or financial issues should also have been considered. The impact of the interventions on other benefits to families, such as reductions in carer burden and event improvements in carer quality of life, were not considered in the current study.

The authors considered four criteria to ensure the validity, applicability, and generalisability of their findings:

strength of evidence (assessment of the robustness of the estimators used in the analysis),
equity (capacity of the interventions to affect inequity in distribution of mental disorder and access or utilisation issues),
feasibility (availability of an appropriate workforce with appropriate training to implement the intervention), and
acceptability to stakeholders (including patients and their family or carers, clinicians, policy-makers, the general community, and third-party funders).

The authors acknowledged that the quality of the evidence used in the model was weak because of the lack of robust data. Some equity issues could be raised in remote access areas and in non-English speaking groups. The intervention appeared quite feasible within the Australian health care system. Finally, the acceptability to stakeholders could be variable and some long-term problems could arise.

Implications of the study
The authors suggested that the Australian health care system should pay more attention to family interventions for the treatment of patients with schizophrenia and related conditions. Further research should define the effects of family interventions on quality of life issues. Pilot studies evaluating the cost-effectiveness of telemedicine interventions should be carried out in remote areas.

Source of funding
None stated.
Bibliographic details

PubMedID
15255823

DOI
10.1111/j.1440-1614.2004.01404.x

Other publications of related interest


Indexing Status
Subject indexing assigned by NLM

MeSH
Adult; Aged; Australia; Behavior Therapy /economics /methods; Cost-Benefit Analysis; Family; Feasibility Studies; Female; Goals; Humans; Male; Mental Health Services /economics; Middle Aged; Patient Education as Topic; Problem Solving; Psychotic Disorders /economics /epidemiology /therapy; Schizophrenia /economics /epidemiology /therapy; Secondary Prevention; Sensitivity and Specificity; Stress, Psychological /prevention & control /psychology

AccessionNumber
22004001001

Date bibliographic record published
30/04/2005

Date abstract record published
30/04/2005