A comparison between the costs of Australian and Mandometer treatment of eating disorders
Abstract

- We have estimated the costs of the treatment of a group of patients with eating disorders who were first treated in Australia and then at a Mandometer Clinic.

- The median direct cost (intensive care and inpatient, outpatient and psychopharmacological treatment) in Australia was 103 KAUD/patient (range, 4-1 676 KAUD/patient), the median indirect cost (treatment of family member, loss of time for patient and parent and loss of income for parent) was 135 KAUD/patient (range, 13-360 KAUD/patient) and the median total cost was 300 KAUD/patient (range, 35-1 835 KAUD/patient) over a median period of five years. Because these treatments had no effect on outcome and because the spontaneous rate of remission is low, the cost to manage a group of seriously ill patients with eating disorders in Australia is estimated to be about 1 million AUD/patient from onset at 15 until 30 years of age.

- The median direct cost of Mandometer treatment was 141 KAUD/patient (range, 13-360 KAUD/patient), the median indirect cost was 34 KAUD/patient (range, 21-70 KAUD/patient) and the median total cost was 178 KAUD/patient (range, 47-393 KAUD/patient). Because the rate of remission (75%) and relapse (10%) of Mandometer treatment are known, it is estimated that 740 KAUD/patient will be saved during 15 years if Mandometer treatment is implemented in Australia.

Word count: Abstract: 214, main text: 1451
While the treatment of eating disorders is considered expensive, the cost has been estimated in only three studies.²⁻⁴ None of these reported a measure of outcome, but one was based on the assumption that an “adequate care model” reduces the mortality risk for 50% of anorexic patients.³ It was estimated that the cost to obtain this outcome would be 159 KAUD/patient compared to 48 KAUD/patient for treatment as usual that does not have this outcome³ (costs are in AUD, 2007). The absence of a measure of outcome in other studies makes estimation of their cost-effectiveness difficult. The estimation is further complicated because few, if any treatments have been found effective in randomised controlled trials.⁵⁻⁶ Patients remain symptomatic upon discharge and the rate of relapse is high.⁷ Periods of remission, relapse and re-admission increase the cost further.

We recently reported the outcome in 40 Australian patients who were treated at Mandometer Clinics.⁸ Most of the patients had first been treated in Australia and we have estimated the costs of these treatments and compared the result with the cost of Mandometer treatment.

**Methods**

An anonymous survey and a reminder were mailed to the parents. The survey has 15 questions covering the age at onset and duration of the illness, length and type of treatment; intensive care, inpatient, outpatient, medical, psychotherapeutic and psychopharmacological, treatment of family member, loss of time and income and source of funding. There is an open question at the end for information on the experience of previous treatments.
The parents’ responses to the survey were compared with the patients’ responses at admission regarding the duration of illness and the number of previous treatments to estimate the reliability of the survey.

The cost of intensive care, 2 715 AUD/day, and inpatient, 870 AUD/day, and outpatient, 450 AUD/visit, treatment was obtained from one of Melbourne’s tertiary hospitals. The cost of fluoxetine in Australia, 2.5 AUD/day\textsuperscript{9} was used to estimate the cost of psychopharmacological treatment. The cost of outpatient treatment was multiplied by 1.5/week and by 0.5/week for treatment of parents. We used the seasonally adjusted estimate of full-time adult ordinary time earning in the public sector in Australia, 1 101 AUD/week,\textsuperscript{10} to estimate the cost of the loss of time for parents and half of that, 550 AUD/week, to estimate the cost of the loss of time for the patients.

Twenty-two patients were treated to remission or partial remission with Mandometer treatment;\textsuperscript{8} there was no difference in the number of days and in the cost of treating the patients to remission or partial remission. The cost to obtain this outcome was 1 832 AUD/day for inpatient treatment, 537 AUD/day for outpatient treatment and 907 AUD/day for day care. These direct costs and the indirect costs listed above were used to estimate the total cost of Mandometer treatment.

Costs were adjusted to the nearest KAUD and reported as median and range.

Results

Thirty-two parents (80\%) returned the survey. Twenty eight of their children (87.5\%) had been treated in Australia before Mandometer. Considering that 7 patients withdrew from treatment, some after only a few days,\textsuperscript{8} compliance was acceptable. The parents and patients\textsuperscript{8} reported that the duration of the illness was 6 (2-23) and 5
(1-25) years, respectively, and that the number of previous treatment was 3 (0-32) and 3 (0-20). Considering that all patients responded at admission and that the parents of 32 patients responded to the survey, these differences are small and the reliability of the survey is therefore acceptable.

Table 1 about here

Half the patients had received intensive care and three fourths had been treated as inpatients and outpatients (Table 1). Relatively few had only been treated as inpatients (15%) or outpatients (30%). Treatment times were long; up to a total of 2 months for intensive care, 4 years for inpatient treatment and almost 9 years for outpatient treatment. Half the patients had received medical treatment, such as tube feeding (50%) and enforced feeding (21%) and most had been treated with psychotherapy. Half the patients had been treated with a median of 1.5 psychoactive drugs, for up to 7.5 years and with a maximum of 9 drugs. Only two patients had been trained how to eat; a fifth had a community treatment order.

Two thirds of the parents had associated illnesses due to their child’s illness, and had been treated on average about a year; with one parent treated 8.5 years. The treatment provided was psychotherapy but antidepressants were used with two parents. Almost all patients and all parents had lost time as a consequence of the illness; up to 4 and 5 years, respectively. Half the parents had lost income; one had lost 1.5 years of income.

Table 2 about here
The direct costs of treatment were high (Table 2): intensive care up to 163, inpatient care 1 671, outpatient care 284 and drugs 28 KAUD. The indirect costs were also high: treatment of family member up to 92, patient’s loss of time 106, parent’s loss of time 264 and parent’s loss of income 80 KAUD.

Parents’ comments included: “the total cost is almost incalculable”, “the socio-economic impact if this illness is enormous”, “this has been an extremely expensive time” and “the physical, emotional and economic ramifications of this illness are horrendous”. Treatment was reimbursed through a combination of private pay, insurance and public funding.

A comparison between the costs estimated above and the costs of Mandometer treatment showed that while the median direct costs were similar, the indirect, maximal and total costs were lower with Mandometer treatment (Table 3).

**Discussion**

The patients in this study were seriously ill; treatment of patients who are less severely ill may be less expensive. However, it is difficult to determine the cost-effectiveness of the methods used to treat eating disorders in Australia because the cost has not been reported and the effect is unknown.11

On the basis of the costs calculated here, it is possible to estimate the aggregated cost over time for eating disorder patients treated in Australia. Thus, the patients were about 19 years old, they had been ill for about 5 years and the costs for managing their illness had been 10 569 million AUD. There is no reliable information
on the rate of spontaneous remission in eating disorder patients,\textsuperscript{12} and because the patients had not responded to treatment, we estimate that about 10% might remit within 15 years and so the expected aggregated cost is $0.9 \times 10^{-5} \times 569 \times 15/5 \times 28 = \text{about 1 million AUD/patient}$ from age 15 to 30. The total cost of Mandometer treatment was $178 \text{ KAUD/patient}$ and the rate of remission and relapse of this treatment is 75% and 10% respectively.\textsuperscript{1} The aggregated cost of Mandometer treatment can therefore be estimated to be $178 \times 1.1/0.75 = 261 \text{ KAUD/patient}$ and the associated saving is $1000 - 261 = \text{about 740 KAUD/patient}$ over a period of 15 years.

The main reason why Australian treatment is more expensive than Mandometer is because the patients remain ill or relapse after treatment. Thus, while the direct costs of the interventions used are similar with both treatments the indirect costs and total costs escalates in Australia. We probably underestimated some of these costs by using a relatively low income as an estimate of the cost for loss of time of the parents. The parents were able to reimburse part of the cost of the treatment by private funds and so their income was probably higher than the estimate we used.

The prevalence of eating disorders in Australia has been reported to be 12.5% (anorexia nervosa: 1.9%, partial anorexia: 2.4%, bulimia nervosa: 2.9% and binge eating disorder: 5.3%).\textsuperscript{13} It was also reported that “… only a minority of sufferers becomes asymptomatic” over time.\textsuperscript{13} The cost for managing the patients can be therefore be estimated. The population of Australia is 21.5 million, half are women and about 3.3% are 14-19 years old,\textsuperscript{14} which is the risk age for developing an eating disorder. Thus, there are $21\,500\,000 \times 3.3/2 \times 100 = 354\,750$ Australian women who are at risk and 12.5% of these $354\,750 \times 12.5/100 = 44\,344$ will develop an eating disorder. If we suppose that it will cost half as much to manage these women as the cost estimated above, the total cost will be $44\,344/2 = 22\,172$ million AUD over a period of
In view of the facts and estimates reported here, the recent claim that family therapy brings 80% of patients with anorexia nervosa who are younger than 19 to recovery in one year at a cost of 8-10 KAUD/patient\textsuperscript{15} is surprising and not supported by evidence.\textsuperscript{16} Also, the suggestion that Mandometer treatment is not an option in Australia because of its cost\textsuperscript{17} should be reconsidered.

References


15. Dalton B.


17. Sawyer S.

Acknowledgements

We thank parents for participating and Dr Bengt Assarsson, Department of Economics, University of Uppsala, Sweden and the Riksbank of Sweden for helpful suggestions.
Table 1. Treatment of 28 patients with eating disorders in Australia and some socioeconomic consequences

<table>
<thead>
<tr>
<th></th>
<th>Intensive In-patient</th>
<th>Out-patient</th>
<th>Medical</th>
<th>Psychotherapy</th>
<th>Psychopharm</th>
<th>Com order</th>
<th>Family member</th>
<th>Time lost</th>
<th>Loss of income</th>
</tr>
</thead>
<tbody>
<tr>
<td>(%)</td>
<td>54</td>
<td>71</td>
<td>75</td>
<td>57</td>
<td>79</td>
<td>54</td>
<td>21</td>
<td>64</td>
<td>96</td>
</tr>
<tr>
<td>Months</td>
<td>4&lt;sup&gt;a&lt;/sup&gt;</td>
<td>4.4</td>
<td>10</td>
<td>-</td>
<td>11</td>
<td>-</td>
<td>15</td>
<td></td>
<td>13</td>
</tr>
<tr>
<td>Range</td>
<td>1-60</td>
<td>0.5-64</td>
<td>1.5-105</td>
<td>0.5-92</td>
<td>3-120</td>
<td></td>
<td></td>
<td>2-48</td>
<td>1-60</td>
</tr>
</tbody>
</table>

<sup>a</sup>Days.
### Table 2. Cost (KAUD/patient) of treatment of 28 patients with eating disorders in Australia

<table>
<thead>
<tr>
<th>Direct costs</th>
<th>Indirect costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Treatment</strong></td>
<td><strong>Loss of time</strong></td>
</tr>
<tr>
<td>Intensive In-care</td>
<td>Intensive In-care</td>
</tr>
<tr>
<td>Min</td>
<td>3</td>
</tr>
<tr>
<td>Md</td>
<td>11</td>
</tr>
<tr>
<td>Max</td>
<td>163</td>
</tr>
<tr>
<td>Total</td>
<td>443</td>
</tr>
</tbody>
</table>
Table 3. Cost (KAUD/patient) of treatment of patients with eating disorders in Australia and with Mandometer

<table>
<thead>
<tr>
<th></th>
<th>Direct costs</th>
<th>Indirect costs</th>
<th>Total cost</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Australia</td>
<td>Mandometer</td>
<td>Australia</td>
</tr>
<tr>
<td>Min</td>
<td>4</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Md</td>
<td>103</td>
<td>141</td>
<td>135</td>
</tr>
<tr>
<td>Max</td>
<td>1 676</td>
<td>360</td>
<td>360</td>
</tr>
<tr>
<td>Total</td>
<td>6 581</td>
<td>3 228</td>
<td>3 988</td>
</tr>
</tbody>
</table>
Author details

Cecilia Bergh, PhD
Karolinska Institutet, Section of Applied Neuroendocrinology, Mandometer Clinic,
Novum, S-14104 Huddinge, Sweden, cecilia.bergh@mando.se

Melanie Ward, BSc
Mandometer Clinic, 412 Bay Street, Brighton, Vic 3185, Australia,
melanie.ward@mandometer.com.au

Per Södersten, PhD, professor
Karolinska Institutet, Section of Applied Neuroendocrinology, Mandometer Clinic,
Novum, S-14104 Huddinge, Sweden, per.sodersten@ki.se