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An Economic Analysis of Psychotherapy for Borderline Personality Disorder Patients

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Abstract

Background: BPD is a serious mental illness in which psychotherapy has been shown to improve patient outcomes and reduce the use of health services. In most studies of psychotherapy, lower use of health services has been taken to imply lower health service costs. However, the costs of psychotherapy can offset any cost savings due to reduced use of other health services.
Aims of Study: To estimate the net costs of health service use in a group of BPD patients receiving intensive psychotherapy.
Methods: Data on use of inpatient hospital, emergency hospital, ambulatory care, diagnostic tests and medications were collected for the twelve months before psychotherapy and the twelve months after the completion of treatment. Cost estimates were developed using standardised unit costs.
Results: There was a saving of approximately $670,000 in health service use over the thirty patients compared to a cost of $130,000 for psychotherapy, giving a net cost saving of $18,000 per patient. Most of this was due to reduced hospital admissions. Cost saving was higher in those patients who were high users of hospital services. Sensitivity analyses were performed; overall, the findings consistently show a reduction in the cost of health services used.
Discussion: The group studied consisted of 30 patients and comprised a before/after design. Therefore it does not overcome criticisms of other work in this area, that is of observational studies and small sample sizes. Nonetheless, the results were based on detailed costing of service use, using conservative assumptions and subject to sensitivity analysis.
Implications for Health Care Provision and Use: The use of intensive psychotherapy in BPD patients who are high users of health services, particularly those who have had multiple hospital admissions, is probably warranted until more evidence is available.
Implications for Health Policies: There is little rigorous evidence on the effectiveness and cost-effectiveness of psychotherapy. BPD patients appear to generate high service costs so it is important to establish effective and cost-effective modes of treatment.
Implications for Further Research: Further research is warranted to establish accurate patterns of service use in BPD patients, and to identify those groups who will most benefit from intensive psychotherapy.

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Introduction

Borderline Personality Disorder (BPD) is a serious mental illness, with significant mortality and morbidity. BPD is often associated with other personality disorders and social dysfunction. Long term follow up studies have shown that most patients improve over time, whilst short-term outcomes are less favourable.[1] Psychotherapy has been shown to be of benefit in the treatment of BPD;[2] and to be associated with fewer hospital admissions and lower lengths of stay, fewer medical visits and reduced drug use over twelve months.[3,4] However, these reports did not examine the cost savings due to reduced health service use, or the costs of psychotherapy. Stevenson and Meares[5] reported the cost savings attributed to the reduction in inpatient hospital episodes.

It has been argued that there is now a body of evidence supporting the cost effectiveness of psychotherapy, at least in some conditions.[6,7] A number of studies have shown that outpatient psychotherapy is associated with lower medical service use;[8-14] but, as Mumford and Schlesinger[15] point out, reductions in service use are not inevitable. For the most part a lower use of health services has been taken to imply overall cost savings.[14] However, Chisholm[16] reported on the basis of three trials that when the cost of psychotherapy was added to other health service costs, the net impact of psychotherapy was cost neutral. Further, there are substantial differences across programs in the cost of providing psychotherapy and this is a major determinant of cost-effectiveness.[17]

The purpose of this study was to extend the Stevenson and Meares[3,5] analysis to examine the net costs of the treatment of BPD patients. Net costs in this case are defined as the difference between the total costs of use of health services following the completion of psychotherapy plus the costs of psychotherapy itself, and the total costs of use of health services prior to treatment. We have not attempted to relate

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costs to clinical improvement or quality of life. Whilst this focus on costs only is often described as a partial economic analysis, it is appropriate in this case as the benefits of psychotherapy in this patient group have been demonstrated.

Methods

Stevenson and Meares reported the treatment and outcomes of 30 patients. All patients were treated at Westmead Hospital, a large public teaching hospital in the western suburbs of Sydney, New South Wales, Australia. The majority of patients were referred by psychiatrists and trainee psychiatrists who had been using a variety of treatments. Other referrals came from general practitioners, community health services and self-referral. All patients were diagnosed according to DSM-III criteria for BPD; more details are reported elsewhere.[3-5]

The treatment method is described in full in Meares et al.[4] Therapists were psychiatrists in training, senior psychiatric nurses and a psychologist. The treatment model is consistent with, and an elaboration of the Conversational Model of Hobson. Adherence to the treatment model was achieved by the use of audio tapes of the therapeutic encounter; tapes were presented each week to supervisors. Supervisors, at times, supervised together so as to ensure a coherence of approach. Most patients were on some form of medication on entering the trial; medications were typically slowly withdrawn.

Health service use and symptoms at the beginning of therapy and after twelve months following the completion of therapy had been recorded, based on patient recall at interview. These data formed the basis of the 1992 Stevenson and Meares study.[3] Use of health services in the twelve months before psychotherapy was assumed to represent conventional care. It would be expected that during the psychotherapy treatment period, use of health services would be changing, either due to psychotherapy displacing other health service use or a gradual reduction in health service use as health state improved. Hence the use of services in the twelve months after the completion of psychotherapy is more representative of the outcome achieved. Therefore the net costs of psychotherapy were defined as the costs of health care for twelve months after psychotherapy was completed plus the cost of the psychotherapy less the cost of conventional care.

The Australian health care system provides universal cover for medical care, hospital treatment and pharmaceutical benefits. Ambulatory medical services are subsidised by the Commonwealth (federal) government, according to the national Medical Benefits Schedule which specifies a fee level for each type of service, although medical practitioners are able to charge above the scheduled fee. Public hospital services, both inpatient and outpatient, are provided free of charge, and are the responsibility of State and Territory governments. Seventy per cent of all admissions are to public hospitals. There is a national list of prescription pharmaceuticals for which patients pay a small copayment. The perspective taken is that of the health service, ie only health service costs are included, excluding costs to patients and their families apart from 'over the counter' medications. The health services considered were inpatient hospital treatment, emergency (public) hospital treatment, ambulatory care (including visits to general practitioners, specialists, psychologists, social workers, physiotherapists, dietitians), diagnostic tests, and medications (prescription and over the counter).

Costs were estimated for the total patient group, before and after therapy. The total group was disaggregated into high and low service users, based on hospital admission costs before psychotherapy, and costs estimated also for these sub-groups. Sensitivity analysis was undertaken.

All costs are shown in Australian dollars based on 1998 cost and price data.

Service use

Frequency of health service use was based on patient recall for the previous twelve month period. This was checked in two ways. Westmead Hospital medical records for all patients enrolled in the study were reviewed and data on outpatient service use, emergency department visits and inpatient admissions were extracted by one of the investigators (JS). Hospital record data was used to estimate use of services provided by Westmead Hospital. Prescription medication use was compared with reported medical visits (as a medical visit is required to obtain a prescription). Where the total number of visits was less than that required to obtain prescription medications, additional GP visits were imputed to ensure consistency with medication use. For other services, patient recall data were used.

Unit costs of health service use

Acute inpatient admissions were classified according to the Australian Diagnosis Related Groups (AN-DRG version 3). Cost weights were those used in New South Wales and were provided by the New South Wales Department of Health .[18] Where two or more AN-DRG codes could apply to a particular admission, the least costly option was selected. Cost per admission ranged from $517 (pre-term labour) to $7,296 (eating and obsessive-compulsive disorders).

Visits to Accident and Emergency were assigned an AN-DRG code where possible. The difference between the AN-DRG weighted cost including emergency care and the AN-DRG weighted cost without emergency care was used as the cost of an emergency visit for that AN-DRG. Where the reason for visit could not be coded, the cost was estimated at the average cost (over all AN-DRGs) including emergency less the average cost excluding emergency. This gave a cost per emergency visit ranging from $70.23 to $272.30.

Visits to general practitioners and to specialists were costed using Commonwealth Department of Health and Aged Care Medical Benefits Schedule (MBS) fees. The cost used was the average MBS fee weighted according to frequency of that type of visit in the general population. Frequency data were provided by the Health Insurance Commission. This gave an average cost per GP visit as $26.50 and for a specialist visit as $87.50. The cost of outpatient visits was provided by NSW Health; the mean cost varies from $16.00 (for a new

Table 1. Change in health service use costs (1998 Australian $) with psychotherapy

	Before		After		Savings	
	Group	Per patient	Group	Per patient	Group	Per Patient
Inpatient	683,977	22,799	41, 424	1,381	642,553	21,418
Emergency	15,327	511	3,454	115	11,873	396
Ambulatory	43,853	1,462	40,339	1,345	3,514	117
Diagnostic	2,565	86	112	4	2,453	82
Medications	20,067	669	3,901	130	16,166	539
Sub-Total	765,789	25,526	89,230	2,974	676,559	22,552
Psychotherapy			130,050	4,335		
Total			219,280	7,309	546,509	18,217

physiotherapy visit) to $35.00 (psychology).

Diagnostic tests were costed at the MBS fees; for example, a plain chest Xray cost $37.20, full blood count, $17.20. Costs for medication out of hospital were as given in the Schedule of Pharmaceutical Benefits for Approved Pharmacists and Medical Practitioners (1 November 1997) for the "dispensed price for max. qty". Where an antibiotic was prescribed but not specified, it was assumed to be amoxycllin, the most commonly prescribed broad spectrum antibiotic and less expensive than newer classes of antibiotics. The cost of over the counter medications was based on the listed pharmaceutical wholesale price plus 50% (pharmacy mark-up). Inpatient drug usage is included in the AN-DRG cost weights.

Costs of psychotherapy: Psychotherapy was provided by trainee therapists. Each patient attended two one-hour sessions each week. The trainees spent additional time in one training session per week with a supervising psychiatrist, at which all patients were discussed. This was costed on hourly wage rates (according to public hospital awards), plus superannuation and other on-costs, giving a cost per therapy session (one hour) of $43.35, or $4,335 per patient for one year (based on fifty weeks).

Results

Nineteen of the thirty subjects were female. The average age was 29.4 years. Twenty-five were single and five were married or in de facto relationships. Mean DSM score at entry to the program was 17.4 (SD 3.37). Further details are given elsewhere.[3,4]

There was a saving of approximately $670,000 in the costs of health services after the psychotherapy program (**Table 1**) with most cost savings due to the reduction in hospital admissions. The costs of psychotherapy for this group of patients were $130,050, giving a net cost saving of $546,509 or just over $18,000 per patient.

The distribution of hospital inpatient costs is bimodal, with a number of patients incurring low or zero costs, and another group who appear to be high users of hospital services, with

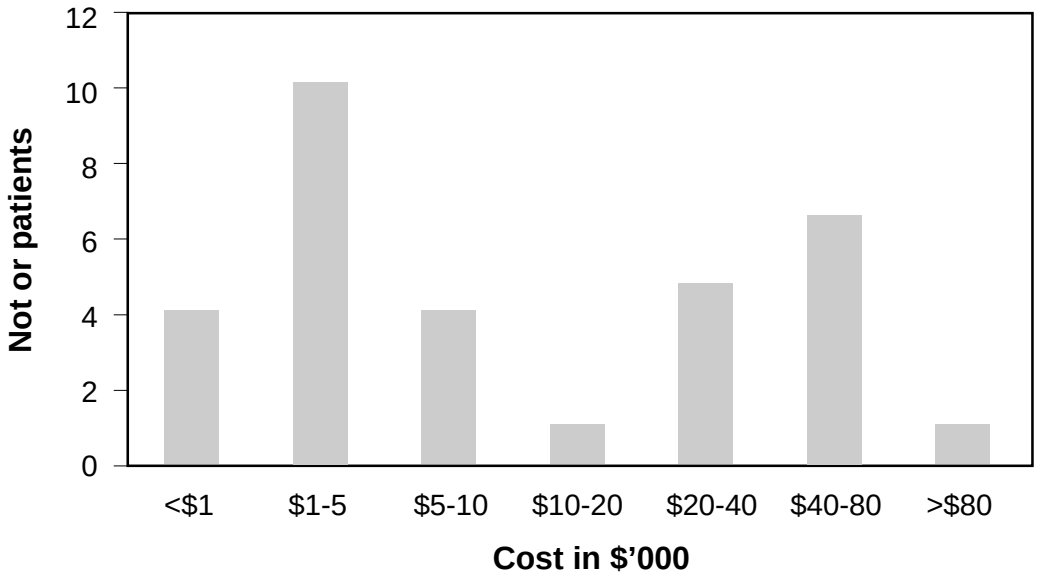

Figure 1. Distribution of hospital costs (1998 Australian $) before therapy

Table 2. Average costs (1998 Australian $) per patient by high and low service users

	Low users N = 18		High users N = 12	
	Before	After	Before	After
Inpatient	3,668	268	51,497	3,051
Emergency	266	57	878	202
Ambulatory	1,622	1,656	1,221	877
Diagnostic	80	0	94	9
Medications	706	102	613	172
Total	6,360	2,102	54,315	4,322

Table 3. Comparison of violent behaviour and drug taking between high and low hospital use patients before therapy

	% Patients with N° Episodes		Average N°	
	High users	Low users	High users	Low users
Violent episodes over 12 months	33	33	2.58	2.77
Self harm episodes over 12 months	8	16	4.83	3.11
Average no of drug doses per day	8	8	3.92	3.72

one patient incurring costs of almost $150,000 (see **Figure 1**). The group was disaggregated into high users, those who incurred over $10,000 per annum in hospital costs (n = 12), and low users who incurred less than $10,000 per annum in hospital costs (n = 18). High users were responsible for approximately 90% of all inpatient costs both before and after psychotherapy and both groups had similar proportionate decreases in health service costs (**Table 2**). However, for low users, the costs of the psychotherapy are about the same as the savings in health service use, making the net cost difference neutral.

The occurrence of violent behaviour, external and self harm, and drug taking in both groups of patients before therapy is shown in **Table 3**. This does not appear to explain the difference in hospital admissions.

Sensitivity analysis

It is generally accepted that the effect of varying key parameters on the results should be analysed. In particular, where estimates are uncertain this shows how robust the results are to variation in those estimates. The analysis was repeated first, eliminating patients from the sample with inconsistent data; second, removing outliers; and third, varying the cost of psychotherapy.

The comparison of Westmead record data with patient recall can provide some evidence of data validity. The number of events reported by patient recall should be greater than or equal to the number obtained from Westmead records for the two data sources to be consistent. The results were re-estimated eliminating eleven patients with an inconsistent response (n = 19). There is a substantial saving in health service costs, although the absolute amount is approximately halved (**Table 4**).

Table 4: Change in health service costs (1998 Australian $) per patient excluding inconsistent responses (n=19)

	Before	After	Saving
Inpatient care	12,125	781	11,344
Emergency visits	458	96	362
Ambulatory care	1,240	1,569	328
Diagnostic tests	75	6	69
Medications	554	122	432
Total	14,452	2,574	11,879

Table 5. Change in health service use costs excluding outlier

	Before		After		Savings	
	Total	Per patient	Total	Per patient	Total	Per Patient
Inpatient care	540,220	18,628	39,895	1,376	500,325	17,252
Other	380,377	2,771	46,333	1,598	34,044	1,174
Total	620,597	21,399	86,228	2,974	534,369	418,426

The second sensitivity analysis examined the impact of one or a small number of patients whose service use patterns fall widely outside the range of service use for the rest of the group. This can be substantial, particularly when the size of the group is relatively small. In this group of patients, there was one whose hospital admissions were costed at almost $150,000 in one year. This compares with the average for the rest of the group of $18,500. As hospital costs are the largest component of total costs, this one patient could have an undue effect on the group results. Therefore the results were re-estimated with the exclusion of this one outlier (**Table 5**); this shows a reduction in health service costs of approximately $18,500 per patient, which is not substantially different to the cost savings for the total group. This is because this one patient continued to have high admission costs after psychotherapy.

The third sensitivity analysis examined the cost of psychotherapy. If psychotherapy for BPD was adopted more widely, it is not clear that all the therapy could be provided under a training program. An alternative means of providing psychotherapy is through specialist psychiatrists. This gives an alternative cost, based on the MBS scheduled fee, of $130.70 per session or $13,070 per patient per year. At this cost, the psychotherapy program results in a net cost saving only for the high use group of patients.

Discussion

These results show a substantial cost saving in the use of health services after a one-year program of psychotherapy. The costs of the program itself are determined by the type of staff providing psychotherapy. In this case, the program was provided by staff undergoing psychotherapy training. At the higher cost of consultant psychiatrists, the program still appears to reduce net costs, particularly in the high use group. However, caution must be exercised in concluding that this demonstrates that intensive psychotherapy for BPD is not just cost-effective but will actually reduce total health service expenditure on this group of patients, for several reasons.

First, a particular problem in this study is the accurate measurement of health service use. Patient recall over periods longer than two weeks is acknowledged to be inaccurate and unreliable and may be even more so in this patient group. There is the potential for bias towards finding net cost savings. Patients recalling service use to an investigator who is involved in service delivery are likely to attempt to please the investigator which in this instance would be lower reporting of service use after the psychotherapy. A preferred method is to extract service use from service provider (ie medical) records or funder (ie health insurers) records. Where patients are not restricted in their use of service providers as is the case in Australia, there are potentially very many service providers, making accurate data collection extremely difficult. Therefore, any study such as this faces difficulties in data collection.

For this analysis, data validity was checked in two ways. The number of medical visits was compared with the prescription drugs reported. The number of hospital admissions was compared with the number recorded in Westmead Hospital records. Both checks showed a high level of inconsistency. As hospital admissions account for the major proportion of total costs, net savings were re-estimated excluding identified inconsistent records. Whilst this may go some way to improving data quality, it can only assess under-reporting. Once inconsistent data were excluded, there still remained a substantial saving in the costs of health service use, and this should increase confidence in the results. Nonetheless, the results were based on detailed costing of service use, using conservative assumptions and subject to sensitivity analysis. Overall, the findings consistently show a reduction in the cost of health services used.

The group studied consisted of 30 patients and comprised a before/after design. Therefore it does not overcome criticisms of other work in this area, that is of observational studies and small sample sizes.[19] In particular, these patients may reduce their use of health services over time, even without a therapeutic intervention. Therefore, the observed cost reduction may be spurious. However, it has been suggested that BPD is a chronic disorder, which shows little change over time.[20] The results have also been disaggregated according to whether patients were initially high users of hospital services. For high users, there is on average a substantial net cost saving; however, for low users the impact on costs was neutral. In addition, there was one patient who accounted for the majority of hospital costs. After excluding this as an outlier, there remained net cost savings in the high user group. This suggests that there is a group of high service use patients for whom therapy is effective and that further work to identify those patients who stand to benefit most may be useful.

The program may, of course, be cost-effective, even if the net cost result at the end of one year is neutral or costs are increased, if health outcomes are improved. This was not investigated in this analysis, although improved outcomes have been reported for this group of patients. Further, this analysis considered only costs in the year after the completion of psychotherapy. If the reduction in health service use is continued into the future without further psychotherapy, then the stream of cost savings may outweigh the cost of the program.

These findings can be regarded as potentially promising. Before acceptance as an evidence base for health services policy and planning, further research is needed with rigorous data collection methods and a longer time frame. In particular, an appropriate controlled design is required to ensure that observed changes could be validly attributed to treatment. Consideration should also be given to identifying sub groups of patients who benefit most from this form of therapy. However, these results suggest that the investment in such a study would be warranted.

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