

**THE COST-EFFECTIVENESS
OF PSYCHOLOGICAL
INTERVENTIONS**

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EXECUTIVE SUMMARY

- Psychological interventions can effectively treat a wide range of child and adult health problems, including depression, generalized anxiety disorder, panic disorder, post-traumatic stress disorder, eating disorders, substance abuse, and chronic pain. Furthermore, there is mounting evidence that there are also effective psychological treatments for diseases and disorders that are routinely seen in primary care medical practices but that are typically difficult to medically manage, including type 1 diabetes, chronic tension-type headaches, rheumatoid arthritis, chronic low-back pain, chronic fatigue syndrome, and a range of medically unexplained physical symptoms.
- As emphasized by recent submissions to federal and provincial government departments and commissions by the Canadian Psychological Association, l'Ordre des psychologues du Québec, the Manitoba Psychological Society, and the Saskatchewan Psychological Association, psychological services should be an integral component of the Canadian health care system. Not only can psychological interventions be effective in their own right but they have the demonstrated potential to actually reduce health care costs.
- A 1993 estimate indicated that the total annual cost to Canadian society of illnesses was almost \$130 billion. The health burden of mental disorders and nervous system diseases—conditions for which psychologists routinely provide services—accounted for 13.4% of these costs. The economically most costly conditions were cardiovascular diseases and musculoskeletal diseases, and there are psychological services, both preventative and therapeutic, that are known to be effective in treating such diseases.
- More recent estimates suggest that (i) in 1998 the health burden costs in Canada associated with depression and general psychological distress, alone, ran to over \$14 billion and (ii) the annual per capita health and disability costs of depression are greater than those associated with hypertension and comparable to those associated with heart disease, diabetes, and back problems.
- Recent evidence has demonstrated that psychological interventions can be more cost-effective than optimal drug treatment for conditions such as panic disorder and depression. For example, although empirical evidence on panic disorder indicates that cognitive-behavioural treatment and pharmacological treatments have comparable effectiveness, the psychological intervention has been estimated to cost 10%-50% less than drug treatments. In the treatment of depression, meta-analyses have demonstrated that psychological intervention (especially cognitive-behavioural treatment) can produce comparable or superior outcomes to medication and that pharmacotherapy has substantial larger drop-out rates than does psychological intervention. Moreover, a recent study found that, over a two-year period, pharmacological treatment is likely to cost 30% more than cognitive-behavioural treatment.
- Over the past three decades, dozens of research studies have found that, following effective psychological interventions, usual costs to the health care system are reduced or averted—this is known as medical cost offset. Such cost offsets due to psychological intervention have been found for numerous conditions and diseases, including heart disease, hypertension, diabetes, cancer, and chronic pain.

- In two Canadian studies, (i) brief psychological intervention provided in a family medical centre was found to yield improvement in psychological functioning and a 50% reduction in medical appointments and (ii) brief group psychological intervention for women who had completed medical treatment for stage 0, I, or II breast cancer resulted in an improvement in patients' adjustment and quality of life and a reduction of 23% in health care costs for the two years following intervention.
- A recent meta-analysis of 91 research studies published between 1967 and 1997 found that average health care cost savings due to psychological intervention were in the range of 20-30% across studies. Indeed, 90% of the studies reported evidence of a medical cost offset. Among the studies that included a description of estimated cost savings, only 7% reported that the costs of psychological treatment exceeded the cost savings that resulted from the intervention. Thus, not only did most of the psychological interventions lead to reductions in health care costs, but these reductions were typically large enough to fully cover the costs of the psychological interventions themselves.
- To conclude, there is clear and compelling evidence that psychological interventions can effectively treat a wide range of child and adult health problems. Psychological treatments can also be very cost-effective forms of treatment and may even be more cost-effective than commonly used pharmacological interventions. Psychological interventions also have the potential to reduce health care costs, as successfully treated patients typically reduce their utilization of other health care services. In some instances, the reduced cost to the health care system may actually be greater than the cost of the psychological service, thus resulting in a total cost offset to the system.

THE COST-EFFECTIVENESS OF PSYCHOLOGICAL INTERVENTIONS

Based on decades of research on the effects of psychological interventions, there is clear and compelling evidence that there are psychological interventions which are effective in treating a wide range of child and adult health problems, including depression, generalized anxiety disorder, panic disorder, post-traumatic stress disorder, eating disorders, substance abuse, and chronic pain (Nathan & Gorman, 1998; Chambless & Ollendick, 2001; Roth & Fonagy, 1996; U. K. Department of Health, 2001). As research continues to progress, there is mounting evidence that there are also effective psychological treatments for diseases and disorders that are routinely seen in primary care medical practices but that are typically difficult to medically manage, including type 1 diabetes (Hampson et al., 2000), chronic tension-type headaches (Holroyd et al., 2001), rheumatoid arthritis (Sharpe et al., 2001), chronic low-back pain (van Tulder et al., 2000), chronic fatigue syndrome (Whiting et al., 2001), and a range of medically unexplained physical symptoms (Nezu, Nezu, & Lombardo, 2001).

Evidence for the positive impact of psychological treatment is important, but in the current context of accountability and cost containment, it is, on its own, insufficient (Mash & Hunsley, 1993). Indeed, both national and provincial psychological associations have recently made submissions to government departments and commissions emphasizing the savings to the health care system that could result from greater accessibility to appropriate psychological services (Canadian Psychological Association, 2001; l'Ordre des psychologues du Québec, 2000; Manitoba Psychological Society, 2001; Saskatchewan Psychological Association, 2001).

The primary goal of this paper is to highlight the cost-effectiveness of psychological interventions. The paper begins with a review of the current fiscal situation in Canada as it relates to health care costs in general and psychological services more specifically. Next, an overview of costing concepts is provided and analytic strategies for evaluating health care costs are presented. The next two sections deal specifically with evidence regarding cost savings that are likely to result from psychological treatment. Evidence for the cost-effectiveness of psychological intervention versus pharmacologic intervention is presented for the treatment of two common psychological disorders: panic disorder and depression. Following this, evidence that effective psychological intervention frequently results in costs savings for the health care system (i.e., medical cost-offset) is summarized. Finally, the implications of these findings for the provision of psychological services in Canada are discussed.

HEALTH CARE COSTS IN CANADA

Before turning to the evidence on the cost-effectiveness and cost-offset of psychological services, it is necessary, as a backdrop, to have information on health care expenditures in Canada. The Canadian Institute for Health Information estimate for the

year 2001 was that health care spending exceeded \$102 billion, with approximately 73% attributable to public sector funding (Canadian Institute for Health Information, 2001b, 2001c). Additionally, for the past several years, of all provincial program expenditures, approximately one-third was targeted for health care spending. In Canada, the nature of federal, provincial, and territorial government data on health services is such that it is difficult to determine actual expenditures on psychological interventions. For example, although 20% of all expenditures on mental health services in Ontario are for psychotherapy, the extent to which this includes the whole range of behavioural health care interventions (i.e., psychological treatment for all diseases and disorders, not just services for conditions typically seen as mental health problems) cannot be determined (Sadavoy & Perry, 1999). Furthermore, as it has been estimated that the majority of consultations with psychologists occur outside of publicly-funded institutions (Stephens & Joubert, 2001), even data on publicly-funded health services would dramatically underestimate the true costs of psychological services in Canada.

It is informative to contrast this state of affairs with recent conservative estimates of the costs of illness and health problems to the Canadian economy. A 1993 estimate indicated that the total annual cost to Canadian society of illnesses was almost \$130 billion—an amount equivalent to almost 15% of Canadian GDP. The health burden (including both direct costs of health care services and indirect costs due to lost productivity and death) of mental disorders and nervous system diseases—conditions for which psychologists routinely provide services—accounted for 13.4% of these costs. In comparison, the most “costly” conditions were cardiovascular diseases and musculoskeletal diseases, which accounted for 15.2% and 13.8%, respectively. Importantly, there are psychological services, both preventative and therapeutic, that are known to be effective in treating such diseases.

A more recent and comprehensive estimate suggested that in 1998 the costs (direct and indirect) associated with depression and general psychological distress, alone, ran to over \$14 billion (Stephens & Joubert, 2001). With respect to the financial burden of depression, these Canadian data are consistent with American data which suggest that the annual per capita health and disability costs of depression are greater than those associated with hypertension and comparable to those associated with heart disease, diabetes, and back problems (Druss, Rosenheck, & Sledge, 2000). In addition, recent American estimates of the societal costs for anxiety disorders—conditions not directly assessed in the data used by Stephens and Joubert (2001)—are that in 1990 the annual cost of anxiety disorders was \$42.3 billion US (Greenberg et al., 1999). Based on the data estimates developed by Stephens and Joubert (2001), of the estimated \$6 billion cost for treatment of depression and general psychological distress in Canada, less than \$150 million was spent on services provided directly by psychologists. In light of (i) the consistent finding that appropriate psychological intervention for depression (especially cognitive-behavioural approaches) has comparable or superior effects to antidepressant medication (DeRubeis, Gelfand, Tang, & Simons, 1999) and (ii) indications of greater cost-effectiveness of such treatments relative to antidepressant medication (Antonucci et al., 1997), such estimates can only be interpreted as a severe and costly underutilization of psychological services for the treatment of depression within the Canadian health care system.

COSTING CONCEPTS

The following overview of costing concepts is based on material presented by Hargreaves, Shumway, and Hu (1999) and Knapp and Healey (1999). For an in-depth treatment of these issues as they relate to psychological services, more information is available in Hargreaves, Shumway, Hu, and Cuffel, (1998), Miller and Magruder (1999), Spiegel (1999), and Yates (1996).

There are multiple analytic approaches to obtaining economic evaluations of health care services, each with its own range of convenience. The most commonly used are cost-benefit analysis, cost-effectiveness analysis, and cost-utility analysis. Although all provide economic estimates that can be used by policy makers and administrators to guide their resource allocation decisions, they differ in significant ways. Cost-benefit analysis addresses the extent to which a specific treatment yields a socially desirable outcome. All costs and benefits are expressed in monetary terms and can, therefore, be directly compared. If the benefits of a treatment exceeds its costs, this would indicate that there is merit (in fiscal terms) in implementing the treatment. In contrast, cost-effectiveness analysis focuses on the ratio of monetary costs to measures of treatment outcome (such as a reduction in symptoms or an increase in work productivity). Cost-effectiveness analysis is particularly suitable for comparing treatment options. Specifically, it can be used to determine (i) if two treatment options have equal costs, which has the greatest benefits or (ii) if two treatment options have equal benefits, which costs less. Finally, cost-utility analysis is similar to cost-effectiveness analysis except that the impact of the treatment is measured and converted to a standard valuing metric such as well years of life. Typically this metric is standardized in terms of quality-adjusted life years (QALY: the number of years of life in which the individual would be expected to be completely free of symptoms or disability as a result of the intervention). For example, the cost-effectiveness of installing driver-side airbags on automobiles was found to be \$24,000 US per QALY (Graham, Thompson, Goldie, Segui-Gomez, & Weinstein, 1997) and the cost-effectiveness of deploying automated external defibrillators on commercial aircraft ranged from \$35,300 US to \$94,700 US per QALY (Groeneveld et al., 2001). Turning to an example focused on a psychological intervention, Toeus, Kaplan, and Alkins (1984) examined the impact of a cognitive-behavioural program designed to provide psychoeducational information and assist in lifestyle changes for patients diagnosed with chronic obstructive pulmonary disease. They found that the treated group, compared to the untreated control group, had better overall health even 18 months after the intervention. They calculated that the treatment cost required to produce a “well year” was under \$25,000 US.

For all economic evaluation approaches there is a common framework regarding how to estimate the societal cost of an illness or condition. It is critical, if the evaluation is to be complete, that all costs that stem from the illness or condition are accurately and fully estimated. In general terms, this requires consideration of both direct and indirect costs, or, in other words, the value of resources used and the value of resources lost. Direct costs may involve components such as: treatment costs for the identified condition, costs stemming the utilization of other health care system services, and other service costs (e.g., use of nontraditional health care services, involvement

with the criminal justice system). In some cases, direct cost estimates may also include elements such as: transportation costs to receive treatment, lost work productivity costs due to receiving treatment, time costs associated with waiting for treatment, administrative (transfer) costs associated with the treatment, and capital costs associated with the value of the property in which treatment is provided. Indirect costs, in contrast, typically involve costs due to lost productivity, absenteeism, underemployment, or unemployment which result from the condition itself and from possible early disability and death due to the condition. As would be imagined, indirect costs are notoriously difficult to fully estimate.

There is an important costing phenomenon that is distinct from those just described. As a result of an intervention or an improvement in the effectiveness of an intervention, usual costs to the health care system may be reduced or averted. Although perhaps better conceptualized as health care service offsets, such costs are typically described as medical cost offsets. The most likely example of a cost offset is when a condition that has been overlooked, misdiagnosed, or ineffectively treated is accurately recognized and treated. Although there are clearly direct costs associated with the treatment, there may be cost savings that result from a decrease in utilization of other health care services (e.g., discontinuation of unnecessary therapy or medication, reduced number of visits to a general medical practitioner or to emergency rooms). Furthermore, if the costs savings resulting from appropriate treatment are equal to or greater than the costs of the treatment itself, such a result is called a total offset.

As will be described in detail in a subsequent section, there is considerable research that indicates psychological interventions are often associated with medical cost offsets and, in many cases, even total cost offsets. Kashner and Rush (1999), among others, have posited that these cost offsets are likely due to multiple factors. For example, changes related to psychological intervention may make the patient more responsive to other health care treatment or may encourage the patient to be more willing to adhere to medical advice and treatment regimens (including medication prescriptions and diet and lifestyle recommendations). Additionally, psychological interventions may help the patient achieve better overall psychological and physical health, which would lead to a reduced need for health care services. Finally, it is very likely in many cases that there is a substitution effect at work, in which, as a result of receiving treatment from a specialist, visits to a general medical practitioner who was previously providing guidance or counselling are curtailed. It should not be simply assumed that the provision of psychological services will necessarily result in overall cost savings. Indeed, Kashner and Rush (1999) cautioned that health care costs may increase in some situations due to psychological intervention. This may result from the discovery of other illnesses or conditions that require care, greater valuing of attending to health care needs, and even increased longevity which may result in increased health care costs for patients with chronic conditions.

COST-EFFECTIVENESS OF PSYCHOLOGICAL INTERVENTIONS

Although research on the cost-effectiveness and cost-benefits of psychological intervention is relatively recent, there is growing evidence that supports the cost-effectiveness of interventions such as, for example, multisystemic therapy for distressed youth (Schoenwald, Ward, Henggeler, & Rowland, 2000) and marital therapy as an adjunct to the outpatient treatment of alcoholism (O'Farrell et al., 1996). There are also indications that, compared to medical interventions for the same disease/disorder, psychological interventions may have comparable or superior cost-effectiveness (Miller & Magruder, 1999). Of course, in interpreting such findings it is important to remember that, per capita, there are far fewer psychologists available to provide appropriate services than there are medical practitioners available to prescribe appropriate medical services. Although there are three times as many psychologists providing health care services as there are psychiatrists in Canada (Canadian Psychological Association, 1999), for every 100,000 Canadians there are 185 physicians and only 40 psychologists (for comparison purposes, there are 54 dentists, 49 physiotherapists, and 16 chiropractors per 100,000 Canadians; Canadian Institute for Health Information, 2001a).

To illustrate the nature and results of recent cost-effectiveness analyses, one example dealing with the treatment of anxiety disorders and one dealing with the treatment of depression will be presented. Cost-effectiveness analyses of these disorders are especially important given that the health care costs associated with depression and anxiety disorders are substantial, due to the high medical service utilization rates of people with these disorders. Indeed, American estimates are that 15% of patients seen in primary health care settings suffer from these disorders and that average health care costs for such patients over a 6-month period are \$2,390 US, compared to \$1,397 US for patients without such disorders (Simon, Ormel, Van Korff, & Barlow, 1995; see also Candilis & Pollack, 1997, and Greenberg et al., 1999). Although this difference is sizeable, less than 10% of the total costs were actually due to the costs of mental health treatments. Other American estimates suggest that the indirect societal costs of depression (including lost productivity and absenteeism) are at least three times as great as the direct treatment costs associated with the condition (Zhang, Rost, & Fortney, 1999) and are as great or greater than the indirect societal costs associated with common chronic medical conditions (Druss et al., 2000).

Gould, Otto, and Pollack (1995) examined the costs for the treatment of panic disorder over a two-year period, comparing cognitive behavioural treatment (CBT) to commonly prescribed medications (both antidepressants and high potency benzodiazepines). As a first step in cost-effectiveness analyses, there must be evidence regarding the relative effectiveness of the treatment options being considered. Thus, Gould et al. conducted a meta-analysis to compare the overall effect size of pharmacotherapy versus CBT. They used data from 43 studies published between 1974 and 1994 that used randomized controlled trials. In general they found that the effect sizes for CBT and pharmacologic interventions were very similar, with effect sizes of treatment effects on panic frequency of 0.53 for drug treatments and 0.55 for CBT. Additionally,

they found no significant difference when the effects of antidepressants and benzodiazepines were compared and no evidence that combining CBT with medication resulted in superior treatment outcomes compared to either intervention on its own.

Next, Gould et al. estimated the costs for a typical course of either CBT or medication. For CBT services, costs were estimated as \$90 US per session for individual sessions, \$40 US per session for group sessions, and \$60 US per session for individual follow-up/booster sessions. In comparison, rates for pharmacologic treatment were estimated as \$60 US for a session of pharmacological management, \$0.60 US for 1 mg of generic alprazolam, \$0.09 US for 50 mg of generic imipramine, and \$1.93 US for 20 mg of branded fluoxetine (Prozac). Both psychological and drug treatments were assumed to commence with a single evaluation session of equal costs. CBT costs were computed based on 15 sessions, with 1 additional session during the first year of treatment and 4 additional sessions during the second year. Pharmacologic treatments costs were computed based on 2 sessions for the first month, monthly sessions for the next 3 months, 3 additional sessions during the first year, and 4 additional sessions during the second year. Medication dosages were selected to reflect typical dosages in clinical trials. No estimates were made for transportation costs, costs associated with lost productivity due to attending treatment sessions, or administrative costs.

Based on these treatment component estimates, Gould et al. calculated that a course of individual CBT treatment cost \$1650 US over two years; the comparable total treatment cost for group treatment was \$840 US. In contrast, treatment with alprazolam ranged from \$1800 US to \$3312 US, depending on dosage, treatment with imipramine cost \$912 US, and treatment with branded fluoxetine cost \$3504 US. This information, when combined with the aforementioned effectiveness results, indicates that CBT interventions are comparable in effectiveness to commonly used medications but are much less expensive than most available pharmacologic options. Although this cost-effectiveness analysis is informative, it is important to note that it is incomplete, as only direct costs of providing treatments were included in the cost analysis.

A more complete cost-effectiveness analysis was conducted by Antonuccio, Thomas, and Danton (1997) in their study of treatments for depression. As they noted, several meta-analytic studies published in both psychiatry and psychology journals have found that (i) psychological intervention (especially CBT) can produce comparable or superior outcomes to medication in the treatment of depression, (ii) combined psychological and medication intervention is not superior to either treatment option on its own, and (iii) pharmacotherapy has substantial larger drop-out rates than does psychological intervention. Based on these meta-analytic evaluations, it is evident that CBT is at least as effective as commonly prescribed antidepressant medication in the treatment of depression.

Antonuccio et al. developed a comprehensive cost-effectiveness model that included direct treatment costs to the patient or the third-party provider (health care provider costs, medication costs, lost wages, travel costs, and comorbidity costs), direct costs to the community (economic multiplier effect from lost wages, reduced taxes due to lost wages, and reduced community service work by patients), and indirect costs to society (lost productivity during treatment, economic multiplier effect from lost productivity, reduced taxes due to lost productivity, and lost income potential from suicide). In their model, costs were estimated for treatment over a two-year period, and estimates for

relapse rates, drop-out treatment costs, and subsequent treatment costs were also calculated. Although they pointed out the importance of factoring in costs associated with treatment side effects, the researchers were unable to obtain sufficient data to allow for quantification and inclusion in their cost-effectiveness model. All estimates used data stemming from peer-reviewed journal publications and from state economic information (from the researchers' home state of Nevada). Given the complexity and the scope of their model, specific cost estimates for each cost item will not be presented here. Instead, the focus is on the general findings when their model was applied to the treatment options for depression.

Rather than presenting a range of treatment options as Gould et al. (1995) did, Antonuccio and colleagues compared individual CBT for depression (estimating 20 sessions over a two-year period) with fluoxetine (involving 40 mg of medication per day and management appointments with psychiatrists every 6 weeks). Factoring in all the cost elements described previously, these researchers estimated that the total treatment costs for individual CBT were \$23,696 US over a two-year period (\$7,268 US direct treatment costs to the patient/provider, \$1,253 US direct costs to the community, and \$15,174 US indirect costs to society). In comparison, pharmacologic treatment cost a total of \$30,733 US over two years, or 30% more than individual CBT. The components of this total included \$12,738 US direct treatment costs to the patient/provider (i.e., 75% more than the same category of costs for individual CBT), \$946 US direct costs to the community, and \$17,049 US indirect cost to society. Finally, the combined treatment option was slightly more expensive than the fluoxetine alone option (\$31,245 US). The reason for such a slight cost increase for the combined treatment was that the researchers assumed that the treating psychiatrist would be competent to provide both treatments and that both medication management and CBT interventions would be included in the same sessions. Of course, treatments provided by two independent practitioners (one for the medication and one for the psychological treatment) would increase the costs of the combined treatment substantially. In sum, then, individual CBT was the most cost-effective option available for the treatment of depression, and was, therefore, recommended by the researchers as the treatment of first choice for dealing with unipolar depression.

In conclusion, as the availability of high-quality cost-effectiveness studies grows, there will be increasing opportunities for public policy analysts to critically compare the economic merits of psychological treatment relative to pharmacologic treatment. Based on evidence to date, it appears certain that there will be a number of illnesses and conditions for which psychological intervention will be shown to be among the most cost-effective treatment options.

MEDICAL COST OFFSET

One of the first studies examining the link between the psychological intervention and subsequent health care utilization was conducted by Follette and Cummings (1967). The medical records of 152 randomly selected adults seeking psychological services through the Kaiser Foundation Health Plan in northern California were examined and data were collected on their utilization of health services one year prior to starting treatment and for the five years following the beginning of treatment. Of these patients, 80 were seen for one consultation session only, 41 were seen for between 2 and 8 sessions, and 31 were seen for 9 or more sessions ($M = 34$ sessions). A comparison group of adults was obtained by searching medical records for patients who had never received psychological services but who were matched to the treatment sample on age, sex, socioeconomic status, and medical utilization rates (for the year prior to the start of treatment for the treated patients). Follette and Cummings found that, for the comparison group who did not receive treatment, the utilization of health care services increased over the period encompassed by the study. In contrast, there were significant declines in the utilization rates of those who received treatment, with the most significant declines occurring in the second year following termination of treatment. Even the patients who received “long term” treatment (i.e., nine or more sessions) experienced some declines in utilization. Although this group’s use of outpatient services did not decline, their use of inpatient services did—at the start of the study period these patients had an annual average of 5 days of hospitalization, but by the end of the study period this had decreased to .7 days per year (the plan average was .8 days in hospital).

In the years following this research, numerous other investigators began to examine possible medical cost offsets due to the provision of psychological interventions. Medical cost offsets have been found for an incredibly broad range of health problems. The following paragraphs provide just a small sample of this literature.

In a three-year study of patients diagnosed with ischaemic heart disease, hypertension, diabetes, or airflow limitation disease, Schlesinger, Mumford, Glass, Patrick, and Sharfstein (1983) tracked the adjustment and health care utilization of 700 patients who received psychological interventions and 1,300 patients who did not receive such services. Compared to the untreated patients, those who received psychological treatment evidenced a 40% reduction in annual medical costs (\$950 US and \$570 US, respectively). Once the cost of psychological intervention was taken into account, there was still a 5% net saving for the group who received treatment. Similar results were reported by Fahrion, Norris, Green, and Schnar (1987) in their study of hypertension. Using stress management interventions, the symptoms of over 50% of patients were well controlled without the need to resort to pharmacological treatment and the average total medical costs saved per patient over a 5-year period was over \$1,300 US.

Rehabilitation programs for injuries and disabilities are increasingly provided as part of the health care system. Not surprisingly, therefore, there have been many evaluations conducted to examine the costs and benefits of these services. Although the figures vary depending on the nature of the problems treated and the type of intervention, there is consistent evidence of cost offset. For example, in a study of hospital

costs five years prior to and following psychological treatment for stress-related disabilities, Gonick, Farrow, Meier, Ostmand, and Frolick (1981) found that every dollar spent on psychological treatment resulted in a saving of five dollars. Successful treatment of chronic pain conditions has also been found to result in substantial savings to the health care system. As an illustration of this type of finding, Jacobs (1987, 1988) reported that one year after successful treatment, patients' use of inpatient services had decreased by 72-81% and their use of outpatient services had decreased by 41-50%.

Some cost offset studies have been conducted in Canada. Based on a retrospective analysis of patients' medical records 6 months prior to receiving psychological treatment, during treatment, and 6 months following treatment, Golden (1997) investigated whether a course of psychological treatment reduced the use of medical services. Thirty-three adults at a family medical centre in London, Ontario, were provided treatment, with a median duration of treatment of 12.5 hours. Data from the file review indicated that the frequency of appointments with family physicians decreased both during and following treatment. Indeed, compared to the period prior to treatment, there was a 50% reduction in medical appointments following the brief intervention. Simpson, Carlson, and Trew (2001) recently reported on the effect on healthcare utilization of brief group intervention (six 90-minute sessions) for women with breast cancer. In this study at the Tom Baker Cancer Centre in Calgary, Alberta, 89 women who had completed medical treatment for stage 0, I, or II breast cancer were randomly assigned to receive either no further intervention (beyond the usual psychosocial care available to patients at the Centre) or the structured group therapy intervention. Psychological adjustment data and Alberta Healthcare billing records were obtained for two years after the psychological intervention. Overall, the intervention was effective in improving the adjustment and quality of life of those in the treated group compared to the untreated group, and this effect was still evident. Additionally, the average amounts billed to the provincial healthcare system for the two years following intervention were 23% less for the intervention group compared to the control group, for an average savings of almost \$150 per patient. The investigators estimated that the cost of the group intervention per patient was approximately \$100, thus the intervention entirely paid for itself (and more) in terms of overall costs savings to the provincial system.

In the past three decades, there have been several reviews of the medical cost offset phenomenon, all of which have concluded that offset occurs for most psychological interventions.

In the first review of this literature, Jones and Vischi (1979) reported that there were 30 studies that had found cost offsets due to the provision of psychological interventions to alcoholism, drug abuse, and various mental health problems. Groth-Marnat and Edkins (1996) found evidence for cost savings resulting from psychological services for preparing patients for surgery, enhancing adherence to medical regimens, smoking cessation, rehabilitation programs, chronic pain disorders, cardiovascular disorders, and general somatic complaints without organic causes. Limiting their review to research on the impact of providing psychological treatment for psychological disorders on the costs of medical care, Gabbard, Lazar, Hornberger, and Spiegel (1997) found that 80% of published studies using randomized controlled trials and 100% of published studies without random assignment reported total cost offsets due to the provision of psychological intervention.

In the most widely cited review of the literature, Mumford, Schlesinger, Glass, Patrick, and Cuerdon (1984) conducted two meta-analyses, one based on the claims files for the Blue Cross and Blue Shield U. S. Federal Employees Plan for the years 1974-1978 and one based on the results of 58 published controlled studies. Their general conclusion was that cost offset effects were typically found for psychological interventions (in approximately 85% of studies), but that the clearest effects occur in the reduction of inpatient service costs (e.g., surgery, hospitalization for chronic conditions such as cancer, cardiovascular diseases, or diabetes). Their data also indicated that cost offsets were greater for older patients (over 55 years of age) than for younger patients.

A more recent and more comprehensive meta-analysis of the cost offset literature was conducted by Chiles, Lambert, and Hatch (1999). Their meta-analysis used data from 91 studies published between 1967 and 1997, and included patient groups such as those undergoing surgery, patients with a history of healthcare system overutilization, and patients receiving treatment specifically for psychological disorders (including substance abuse). Additionally, Chiles et al. examined whether the extent of offset was moderated by such factors as the type of psychological intervention and a focus on inpatient versus outpatient services. Overall, cost savings due to psychological intervention were in the range of 20-30% across studies, and 90% of studies reported evidence of cost offset. Among the studies that included a description of estimated cost savings, only 7% reported that the costs of psychological treatment exceeded the cost savings that resulted from the intervention.

In examining moderating effects, several patterns were observed. First, greater effects were found in inpatient settings than in outpatient settings. Accordingly, Chiles et al. suggested that patients undergoing inpatient medical procedures (such as surgery, oncology services, cardiac rehabilitation services) may account for a larger portion of the overall cost offset than do patients who are receiving outpatient services (such as general practitioner visits for accidents, illness, or infections). Second, greater effects were found for structured psychological interventions that were specific to the patient's condition or complaint than for traditional generic psychotherapy. Finally, there was some weak evidence that (i) patients older than 65 years had a larger medical cost offset due to psychological intervention than did younger adult patients and (ii) offset was evident for child patients as well as adult patients. In sum, although this recent and comprehensive quantitative review clearly demonstrates the robustness of the medical cost offset phenomenon, it also demonstrates that there are specific patient and treatment characteristics that are most likely to be associated with cost savings to the health care system.

CONCLUSIONS

As indicated at the beginning of this paper, there is clear and compelling evidence that psychological interventions can effectively treat a wide range of child and adult health problems. However, psychological treatments can also be very cost-effective forms of treatment and may even be more cost-effective than commonly used pharmacological interventions. Beyond this, psychological interventions also appear to have the potential to reduce health care costs, as successfully treated patients reduce their utilization of other health care services. In some instances, the reduced cost to the health care system may actually be greater than the cost of the psychological service, thus resulting in a total cost offset to the system. Obviously, it is to the advantage of all Canadians that these evidence-based conclusions are considered in attempts to renew our health care system. This is true both for the health of Canadians and for the financial stability of our health care system. With the growing societal costs of health care, any service that can provide improved health status and the possibility of substantial cost savings merits close examination by policy analysts and ministries of health. In sum, research evidence on costing considerations provides a very firm basis for the expansion of options for public funding of psychological services and for increased public access to effective psychological interventions.

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