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Research on Social Work Practice 2006; 16; 38
DOI: 10.1177/1049731505276408

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Cost-Effectiveness of Case Management in Substance Abuse Treatment

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Objective: The purpose of this study, which is part of a larger clinical trial, was to examine the cost-effectiveness of case management for individuals treated for substance abuse in a residential setting. Method: Clients who agreed to participate were randomly assigned to one of four study groups. Two groups received face-to-face case management and one telecommunication case management, and the fourth was the control group. Results: Using a ratio of cost to days free from substance abuse, the case management groups were less cost-effective than the control group at 3 months, 6 months, and 12 months. The telecommunication case management was least cost-effective of the three case management conditions. Conclusion: Results from the analysis revealed case management is not cost-effective as a supplement to traditional drug treatment over a 12-month follow-up period.

Keywords: *case management; substance abuse treatment; cost-effectiveness; social work*

An estimated 52 million Americans are believed to have mental health or substance abuse problems (Edmonds et al., 1997). Health expenditures incurred to treat these illnesses, especially substance abuse, constitute a significant proportion of the national health bill. Estimates of the costs to society from substance abuse have reached approximately \$166 billion, with \$99 billion because of alcohol abuse alone (Robert Wood Johnson Foundation, 1994). In 1995, a conservative estimate of Federal spending on substance abuse totaled \$77 billion, representing roughly 10% of entitlement spending (health, disability insurance, Aid to Families with Dependent Children, etc.; National Institute on Drug Abuse, 1998). A major payer in the substance abuse field is the managed care industry whose role has increased in the past few years. By year-

end 1995, 124 million out of the 142 million Americans enrolled in managed care plans were enrolled in a managed behavioral health program (Edmonds et al., 1997).

With the financial pressures that health care providers are experiencing, many organizations are examining strategies and interventions that would reduce cost and yield better or comparable results. The substance abuse treatment field is no exception. After the success of case management programs in the mental health field (Brindis, Pfeffer, & Wolfe, 1995) in Zimmerman and Wienchowski (1991), many proponents have advocated its use to supplement existing substance abuse treatment regimes. The rationale is that a comprehensive case management will help clients receive coordinated care (Ridgely, 1994) and ongoing support services (Ashrey, 1992; Katz et al., 2000; Siegal et al., 1996), thus reducing the intensity (i.e., costs) of substance abuse treatment and improving overall effectiveness.

Studies of case management have focused primarily on description, theory, and implementation aspects of the intervention (Siegal & Rapp, 1996). Although several studies have shown support for the cost-effectiveness of drug abuse treatment, few have examined the cost-

Authors' Note: The authors wish to thank Dr. Mary Vaughan Sarrazin for assistance with analysis of data. This study was conducted as part of a grant from the National Institute on Drug Abuse (J. A. Hall, principal investigator). Correspondence may be addressed to Shadi Saleh, Ph.D., Department of Health Policy, Management and Behavior, School of Public Health, 1 University Place, Rensselaer, NY, 12144, or via email using ssaleh@albany.edu.

Research on Social Work Practice, Vol. 16 No. 1, January 2006 38-47

DOI: 10.1177/1049731505276408

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effectiveness of case management accompanying drug abuse treatment (Hubbard et al., 1989). Although improved functioning and reduced substance abuse should be the primary focus of any program evaluation related to substance abuse treatment, understanding the costs associated with any intervention cannot be ignored. It is possible that case management may lead to significant decreases in clients' use of substances and significant improvements in their functioning, but if these benefits are accompanied by excessive costs, alternate programs may be more feasible.

This study, which is part of a larger clinical trial, examines the cost-effectiveness of case management for individuals treated for substance abuse in a residential setting. A program administration viewpoint (substance abuse treatment facility initiating a case management supplement to traditional treatment) rather than a broader societal viewpoint is adopted for these analyses. The assumption is made that case management can be an important part of the treatment regime in a substance abuse treatment program.

METHODS

Site and Participants

The study was conducted from October 1995 through October 1998 at Mid-Eastern Council on Chemical Abuse (MECCA) with clients in their residential facility for substance abuse treatment. MECCA is a community-based, nonprofit, substance abuse treatment agency with multiple programs. The main office is located in a metro county (as classified by U.S. Department of Commerce Bureau of Economic Analysis) with a population of 98,000. The three additional counties that comprise MECCA's catchment area are classified as rural counties adjacent to a metro county by the U.S. Bureau of Economic Analysis and have a total population of 42,000. Of MECCA's clients, 85% originate from within the four-county catchment area. Clients in the residential treatment program were recruited to the study if they met any of the following criteria: (a) had more than one drug- or alcohol-related offense, (b) had a breathalyzer test with a blood alcohol content of 0.2 or higher, or (c) were involved in a drug- or alcohol-related accident.

Potential study participants were informed that all information would be kept confidential and that the participant would be compensated for participation in the study. Written, informed consent was obtained from all

participants. A total of 1,109 residential clients were assessed and invited to participate. Of these, 662 (60%) clients agreed to participate. Of these, study staff conducted follow-up assessments with 278 (42%) at 3 months, 306 (46%) at 6 months, and 263 (40%) at 12 months. A greater proportion of participants than non-participants were female, had recent periods of family conflict, had recent days of substance abuse, and had been arrested and incarcerated. Participants also had more psychiatric symptoms than nonparticipants (Vaughn, Sarrazin, Saleh, Huber, & Hall, 2001).

Participants were randomly assigned to one of three experimental conditions (conditions A, B, or C) or a control condition that did not include case management (condition D). The only differences between the case management conditions were the locations at which case managers practiced and the method of communication between case managers and clients.

All of the case managers were employed by the study and used the Iowa Case Management (ICM) model, a strengths-based problem-solving approach or philosophy of case management. The ICM model is grounded in traditional social casework and uses a health care problem-solving philosophy (Hall, Carswell, Walsh, Huber, & Jampoler, 2002). The overall approach with clients is based on a strengths perspective and uses language from solution-focused therapy to emphasize client strengths and resources (Hall & Carswell, 1996). By approaching clients with this perspective, case managers emphasized client assets, desires, abilities, and resources to deal with problems. The ICM approach also demonstrates respect for the clients' ways of thinking and dealing with life situations through specific procedures and activities. Case managers emphasized working with concrete behaviors and clearly delineated goals, rather than focusing on feelings or on vague or undefined outcomes. Furthermore, ICM provided specific techniques for eliciting behaviorally specific goals and examples of strengths and provided guidance on an appropriate clinical framework for therapeutic work. Along with these innovations, the ICM model emphasized outreach into the community with the client and therapeutic counseling at times with the client would benefit most. ICM was organized around six functions that form its core therapeutic process: (a) orientation and contracting, (b) assessment and monitoring, (c) solution planning, (d) referral, (e) orientation to transitional case management, and (f) client-directed case management (Hall et al., 2002).

Condition A (drug treatment agency) consisted of case management by two social workers who were employed

by the study and who had their offices at the primary drug treatment facility. This condition was intended to test whether on-site case management, which is likely to be the predominant approach to case management, is more effective than off-site or other forms of case management not as closely linked with primary substance abuse treatment. These case managers participated in clinical meetings at MECCA and had much easier access to the clients while the clients were in residential treatment.

Condition B (social services agency) consisted of case management by two social workers who had their offices at a local social services agency. This condition was included to test if off-site case management is more effective than on-site case management. These case managers participated in the administrative organization of the social service agency and had more difficulty accessing clients while the clients were in residential treatment at the drug treatment agency. Because residential treatment lasted between 10 and 14 days usually, the inside case managers only had a theoretical advantage during that time when the client lived at the center.

Condition C (telecommunications) was included to compare the effectiveness of a telecommunications system, which is common in many managed-care organizations to face-to-face case management. In the telecommunications condition, a social worker was employed by the study and had an office in the administrative center for the study at the university. By design, this case manager met with clients in person while these clients were in drug treatment and subsequently provided most case management over a telecommunications system. Clients could leave messages on the system as needed and case managers coordinated care and performed other functions over the telephone. The telecommunication case manager worked with a double caseload of clients compared with case managers in Conditions A and B. This case manager met with patients in person at the primary treatment facility one to three times to complete some basic tasks and then provided most case management through a telecommunications system. Clients could leave messages on the system as needed and the case manager coordinated care and performed other functions over the telephone.

The case managers in Conditions A and B carried active case loads ranging from 16 to 20 clients and focused most of their primary interventions during the first 90 days following discharge from drug treatment. These four case managers carried less active case loads (those beyond the first 90 days after treatment) that ranged from 48 to 60 for up to 12 months following intake into drug treatment. As mentioned, the sole telecommunication

case manager had a double case load (32 to 40 active, 96 to 120 less active) that could be handled, theoretically, more efficiently because of the technological features of our telecommunication system.

Measurement of Effectiveness

All individuals admitted to the treatment center during the time period of the study were administered several assessment instruments, including the addiction severity index (ASI). The ASI addresses seven domains including physical health, mental health, alcohol abuse, drug abuse, employment, family, and legal status. It has been used in numerous studies to measure outcomes of substance abuse treatment (Lyons, Howard, O'Mahoney, & Lish, 1997; McLellan et al., 1992). McLellan, Luborsky, O'Brien, Woody, and Druley (1982) have developed summary composite scores covering each of these seven domains. The composite scores have been shown to be highly valid and reliable measures of clients' severity of functioning (McLellan, Luborsky, Woody, & O'Brien, 1980; McLellan et al., 1982). However, these scores are not the most meaningful measures for use in cost-effectiveness analysis because they do not have a standard unit of measurement that can be used for financial analysis by clinicians or program administrators (Saleh et al., 2002).

One of the main criteria for judging the effectiveness of substance abuse treatment is the reduction in substance use (McLellan et al., 1996). For the aims of this study, we selected client self-reported days of any substance use in the past month from the ASI to create the number of days of abstinence during the past month. The measure of substance use employed by researchers can range from amount of the substances used, to the number of days over a specific time period during which the client used a substance at least once, or its inverse, the number of days of abstinence over a specific number of days possible. The basic question is whether we use abstinence (a very conservative measure) as the desired outcome or do we focus on substance use with reduction in substance use as the desired outcome (a more realistic measure in some ways). Some studies measure sobriety as complete abstinence from substance abuse indefinitely (i.e., never relapsing again; Ouimette, Gima, Moos, & Finney, 1999; Walton, Castro, & Barrington, 1994). Others have looked at shorter abstinence periods ranging from 24 months abstinence (Zywiak et al., 1999) to an abstinence year (Shepard, Larson, & Hoffman, 1999a) to days of abstinence from substance abuse (Drake, Mercer-McFadden, Mueser, McHugo, & Bond, 1998). We decided that days

of abstinence would be a reasonable measure of intervention effectiveness, mainly because we do not have evidence-based standards of acceptable substance use by those who have received drug treatment. To measure change over time, the ASI and other instruments were re-administered to study participants at 3, 6, and 12 months following intake into drug treatment. In our overall research, researchers target several outcome variables that are related to the goals of the case management program.

Measurement of Costs

The primary costs considered in the cost-effectiveness analysis were the costs of treatment, case management staff salary and benefits, travel costs, and the cost of the telecommunication system. The costs of substance abuse treatment were added to those related to case management for two reasons. First, the model used in the project considers case management as a supplement to treatment and not as a replacement. Given that, it was important to consider both as one treatment package. Second, substance abuse treatment clients receiving case management are likely to have a different length of stay than clients who receive no case management services (Schwartz & Baker, 1997). It is therefore important to capture such differences in substance abuse treatment costs that otherwise would not be captured if the costs of case management are considered alone.

Costs of substance abuse treatment for all groups were obtained from the treatment facility. Case management labor and travel costs were estimated using data from the case management information system, a computerized database in which case managers log their activities and time spent with or on behalf of each client. Labor costs were estimated for each client based on the number of hours that case managers spent working with or on behalf of the client and the case managers' budgeted salaries and benefits. Travel costs were estimated based on the distance a case manager traveled in his or her case management activities. Telecommunication system costs were allocated based on the cost of the telecommunication system and its use by the case manager and the residential clients recruited in the project. Other costs, such as supplies, training, and overhead were not considered because of insufficient data. The social workers involved with the project were familiar with the case management model, which decreased training costs.

Two approaches to cost calculation were used: cumulative and add-on. In the cumulative method, costs were calculated from baseline to the respective periods (3, 6, and 12 months). The add-on method considered costs

incurred between each of the follow-up assessments (i.e., 0 to 3 months, 3 to 6 months, and 6 to 12 months). The two estimation methods were used because of the high concentration of case management activities during the first 3 months. The first period after the initiation of the relationship involved a labor-intensive, rapport-building effort by the case manager. This period includes building a strong and respectful relationship with the client and identifying personal strengths, past successes, and both formal and informal resources in the client's life. The level of case management activities decreases over time and the amount of case manager time per client is considerably less in the later stages of the project. The use of the add-on cost calculation method allowed for the control for the initial high cost of case management.

Data Analysis Procedures

Analysis of variance was used to test the difference in the number of substance use-free days among the four groups. The Tukey studentized method was used for multiple comparisons. Age, gender, and severity of abuse at baseline were included as control variables.

Average costs for each of the condition groups were estimated from the sources described above (substance abuse treatment facility and case management information system) for each follow-up period. The cost-effectiveness ratios were calculated using the total costs for each group as the numerator and the number of substance abuse-free days per month as the denominator. Sensitivity analysis was conducted to assess the robustness of the results. For the sensitivity analysis, the number of substance abuse-free days during the three follow-up assessments was varied by using the average and the lower and upper 95% confidence intervals (CIs).

RESULTS AND DISCUSSION

Patient Characteristics

Client descriptive statistics are presented in Table 1. The average age of residential clients in the study was 33.5 ($SD = 8.8$), with most of the sample below 46 years of age. More males (59.1%) participated in the study groups than females (40.9%). More than four fifths of the sample (83.3%) was White, followed by African Americans (12.7%). A high percentage of clients (82.0%) had no significant other. The sample was roughly divided equally among the four study groups: the treatment agency group (25.2%), the social service agency group

TABLE 1: Descriptive Statistics of the Sample Characteristics at Baseline for Residential Clients

Characteristics	N	%
Age*	627	
18 to 25	136	21.7
26 to 35	227	36.2
36 to 45	202	32.2
46 to 55	58	9.3
< 55	4	0.6
Gender	643	
Male	380	59.1
Female	263	40.9
Race	654	
White	545	83.3
Black	83	12.7
Hispanic	8	1.2
Indian	10	1.6
Others	8	1.2
Significant other	655	
Has no significant other	537	82.0
Case management condition	662	
Treatment agency	167	25.2
Social service agency	160	24.2
Telecommunication	147	22.2
Control	188	28.4

*Mean age = 33.5, standard deviation = 8.8.

(24.2%), the telecommunications group (22.2%), and the control group (28.4%).

Substance abuse-free days. At each of the three follow-up points, no significant difference was detected between the intervention groups and the control group on changes in substance abuse-free days (Table 2). One trend in client self-reports across all four study conditions was a higher average number of substance abuse-free days in earlier assessments than later assessments.

Cost-Effectiveness Analysis

Cumulative costs valuation. Table 3 presents the cumulative costs of case management and substance abuse treatment for each of the treatment conditions at each of the three periods. At 3 months, the case management conditions incurred more costs than the control group. As discussed, this was expected because of the time spent building up a relationship with the client. All three case management conditions had higher costs of treatment than the control group. Clients receiving case management through the treatment agency had the lowest average treatment costs compared to the other two case management conditions (\$1,795 vs. \$2,026.10 and \$2,058.80). The treatment agency group also incurred the least total costs among the three case management

conditions. Clients receiving case management through the social services agency incurred the highest labor costs and travel expenses.

At 6 months, the three case management conditions continued to incur more total costs than the control group. Clients receiving case management at the treatment agency remained the least expensive of the three intervention groups. However, at this point the total costs of the telecommunications group were less than the social service agency group. Labor and travel costs for the social service agency group were the highest among the case management conditions.

The 12-month estimated costs showed that two case management groups—the treatment agency group and the social service agency group—incurred treatment costs that were less than or very close to those of the control group. The telecommunications group incurred the most total costs among the four study groups.

Add-on costs valuation. Costs calculated incrementally (baseline to 3 months, 3 to 6 months, 6 to 12 months) for each of the four study groups are presented in Table 4. The 3-month results are the same as the cumulative results. For the 3- to 6-month interval, the results show that clients receiving case management in any of the three case management conditions incurred lower incremental treatment costs than the control group. Also two of the three case management conditions—the treatment agency group and the social service agency group—incurred lower total costs than the control group. In the 6- to 12-month interval the results reveal that the total incremental costs for each of the three case management conditions exceeded those of the control group. Clients receiving case management through the social service agency had significantly lower incremental treatment costs than the other groups but higher labor and travel costs.

Cost-effectiveness ratios. Table 5 presents the cost per substance abuse-free day for each of the study groups at the three follow-up assessments. None of the case management conditions was more cost-effective than the control group. Administering case management through the treatment agency was the most cost effective among the three case management conditions at the 3- and 6-month assessments. The cost per substance abuse-free day was \$78.90 for the treatment agency group compared to \$91.40 for the social service agency group and \$99.40 for the telecommunications group. The difference in cost-effectiveness ratios between the treatment agency group and the telecommunications group widened at 6 months.

TABLE 2: Substance Abuse-Free Days per Month by Treatment Group and Follow-up Point: Means, Confidence Intervals, and Sample Sizes

Period	3 Months			6 Months			12 Months		
	M	95% CI	n	M	95% CI	n	M	95% CI	n
Treatment agency	25.2	22.9-27.4	65	24.0	21.9-26.1	82	23.9	21.8-26.1	68
Social service agency	25.8	23.9-27.7	73	23.5	21.2-25.8	80	25.3	23.2-27.4	67
Telecommunications	24.0	21.7-26.3	65	21.9	19.2-24.5	79	21.7	18.9-24.4	63
Control	25.1	23.1-27.0	80	24.0	22.2-25.9	92	22.6	20.0-25.1	72

* $p < 0.05$.**TABLE 3: Average Cost of Substance Abuse Treatment and Case Management by Time Period and Treatment Condition**

	Treatment Agency	Social Service Agency	Telecommunications	Control
3 months				
Average cost of treatment	1795.0	2026.1	2058.8	1697.6
Labor (\$ based on hours)	175.8	282.6	164.4	0.0
Travel expenses	16.5	49.5	16.5	0.0
Computer expenses	0.0	0.0	145.8	0.0
Total costs	1987.3	2358.2	2385.5	1697.6
6 months				
Average cost of treatment	2592.0	2655.2	2740.0	2597.0
Labor (\$ based on hours)	247.0	347.2	246.8	0.0
Travel expenses	28.5	63.8	22.3	0.0
Computer expenses	0.0	0.0	291.6	0.0
Total costs	2867.5	3066.2	3300.7	2597.0
12 months				
Average cost of treatment	2785.6	2702.2	2902.6	2739.7
Labor (\$ based on hours)	295.4	453.8	288.4	0.0
Travel expenses	43.6	103.3	23.4	0.0
Computer expenses	0.0	0.0	583.2	0.0
Total Costs	3124.6	3259.3	3797.6	2739.7

NOTE: Unless otherwise noted, figures are reported in 2001 US\$.

TABLE 4: Average Add-on Cost of Substance Abuse Treatment and Case Management by Time Period and Treatment Condition

	Treatment Agency	Social Service Agency	Telecommunications	Control
3 months				
Average cost of treatment	1795	2026.1	2058.8	1697.6
Labor (\$ based on hours)	175.8	282.6	164.4	0.0
Travel expenses	16.5	49.5	16.5	0.0
Computer expenses	0.0	0.0	145.8	0.0
Total costs	1987.3	2358.2	2385.5	1697.6
6 months				
Average cost of treatment	797	629.1	681.2	899.4
Labor (\$ based on hours)	71.2	64.6	82.4	0.0
Travel expenses	12	14.3	5.8	0.0
Computer expenses	0.0	0.0	145.8	0.0
Total costs	880.2	708	915.2	899.4
12 months				
Average cost of treatment	193.6	47.0	162.6	142.7
Labor (\$ based on hours)	48.4	106.6	41.6	0.0
Travel expenses	15.1	39.5	1.1	0.0
Computer expenses	0.0	0.0	145.8	0.0
Total costs	257.1	193.1	351.1	142.7

NOTE: Unless otherwise noted, figures are reported in 2001 US\$.

TABLE 5: The Average Cost of a Substance Abuse–Free Day per Month by Treatment Condition and Time Period for Residential Clients

<i>Time Period: Intake to</i>	<i>Treatment Agency</i>	<i>Social Service Agency</i>	<i>Telecommunications</i>	<i>Control</i>
3 months	78.9	91.4	99.4	67.6
6 months	119.5	130.5	155.7	108.2
12 months	130.7	128.8	179.1	121.2

NOTE: Figures are reported in 2001 US\$.

TABLE 6: The Average Add-On Cost of a Substance Abuse–Free Day per Month by Treatment Condition and Time Period

<i>Time Period: Intake to</i>	<i>The Treatment Agency</i>	<i>Social Service Agency</i>	<i>Telecommunications</i>	<i>Control</i>
3 months	78.9	91.4	99.4	67.6
6 months	36.7	30.1	43.2	37.5
12 months	10.8	7.6	16.6	6.3

NOTE: Figures are reported in 2001 US\$.

The social service agency group cost \$128.80 per substance abuse–free day at 12 months compared to \$130.70 for the treatment agency group and a significantly higher \$179.10 per substance abuse–free day for the telecommunications group.

Calculating the cost-effectiveness ratios using the add-on cost valuation is presented in Table 6. The two face-to-face case management groups achieved lower cost-effectiveness ratios than the control group (Table 6). The treatment agency group had a cost-effectiveness ratio of \$36.70, and the social service agency's ratio was \$30.10, compared to the control group's \$37.50 per substance abuse–free day. The telecommunications group had the highest ratio (\$43.20). The 12-month assessment showed that the control group was again the most cost-effective among the study groups, with an average \$6.30 spent per substance abuse–free day. A close second was the social service agency group with a cost-effectiveness ratio of \$7.60, followed by the treatment agency group (\$10.80), and the telecommunications group (\$16.60).

Sensitivity analysis. Sensitivity analysis was employed to assess the robustness of the results (Figures 1 & 2). The confidence in the ability to compare the four study groups will be reduced by the overlap that might exist between them because of the dispersion of variable values around the group means. Sensitivity analysis helps decrease the likelihood of inappropriate conclusions that are based on results with wide variation around group means. To examine the robustness of the results, the cost-effectiveness ratios for the four study groups were compared using the 95% CI boundaries of the number of substance abuse–free days. The results show some overlap in the cost-effectiveness ratios especially for cumulative

cost estimation, which highlights the lack of major differences between the study groups when the inputs are changed.

CONCLUSIONS

The purpose of this study was to examine the cost-effectiveness of case management. Two methods of cost calculation were employed using cumulative and add-on averages. Based on our results using cumulative costs, the case management conditions were not more cost-effective than the control group. The results changed, however, when considering the add-on costs. Residential clients receiving case management through the treatment agency and social service agency had lower costs per substance abuse–free day at 6 months than the control group when add-on costs were considered. These lower costs can be partly explained by the dramatic drop in the case management costs compared to the high costs incurred in the first 3 months of client participation because of the extensive case management activities. These early efforts were essential to build a strong relationship with the client. In the cumulative cost analyses, the high initial costs were not offset by the difference in the number of abuse free days between the case management conditions and the control group. However, when costs were calculated as add-on, where the initial costs of case management were not included, the face-to-face case management conditions were more cost-effective than the control group (6 months) or had similar cost-effectiveness ratios (12 months).

As mentioned previously, few, if any, studies have examined the cost-effectiveness of case management in

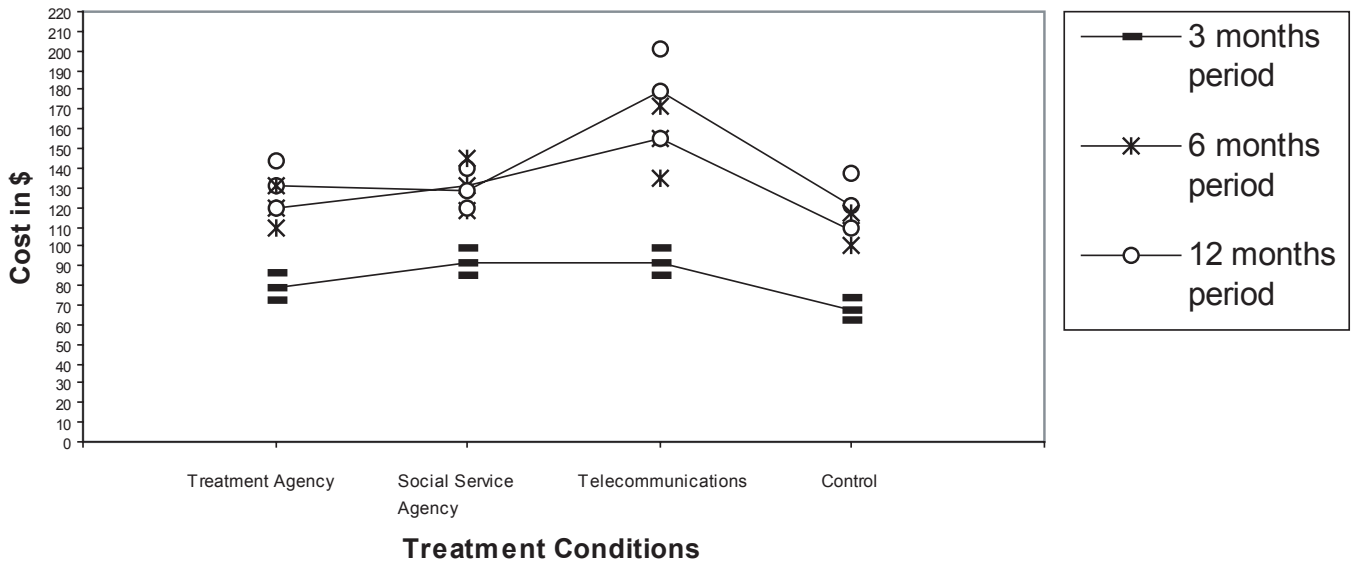


Figure 1: Sensitivity Analysis (Cumulative Cost Calculation)

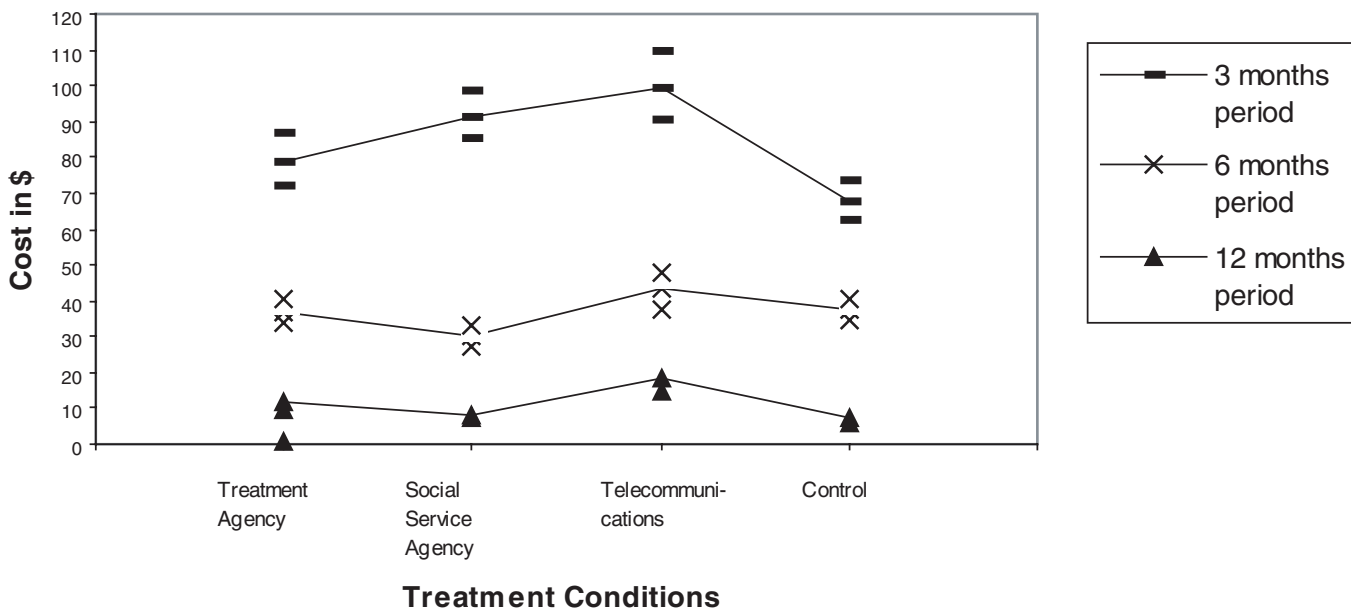


Figure 2: Sensitivity Analysis (Add-On Cost Calculation)

substance abuse treatment, let alone conducted a long-term assessment of its effects. Studies that have examined results of cost-benefits of alcohol and substance abuse treatment have reported that financial benefits begin to appear 2 to 4 years after treatment initiation (Holder, 1998). Because of the short-term follow-up of this study, conclusive evidence of the effects of case management could not be drawn. Case management is an intervention that introduces positive changes in the life of a substance abuser through the trusting and strong relationship built

between the case manager and the client, changes that later help transform the client into an independent self-functioning individual. Such a transformation requires time to develop. One year might not be enough time to see the effects.

Another limitation of the study is the relatively low retention rate achieved in the follow-up assessments (Vaughn et al., 2002). The effects of low follow-up rates in introducing bias to study results have been addressed in the literature. Some investigators dismissed the concern

over bias when having lower-than-usual follow-up rates (Hubbard et al., 1989). Others have argued that low retention affects study outcomes (Apsler & Harding, 1991; Stout, Brown, Longabaugh, & Noel, 1996).

So, where does this leave the question of the cost-effectiveness of case management with substance abuse clients? Obviously, our data do not support the cost-effectiveness of this case management model in this location. Future research could extend the length of time that these clients are followed to determine if the positive benefits of case management (outcomes related to costs) happen as in the Holder (1998) study. Second, other models of case management exist that do not include the intensity of this model (e.g., strengths-based counseling and outreach), and it may be that a less intense model (e.g., brokerage) would result in better results. Finally, similar cost-effectiveness studies need to be conducted in other settings including larger cities to determine if the rural Iowa setting was a negative factor (e.g., difficulty in tracking clients).

DISCUSSION AND APPLICATIONS TO SOCIAL WORK PRACTICE

Many social workers are required to perform a variety of case management responsibilities with their clients. Our assumption has usually been that case management should help clients improve their lives and reduce significant problems in their lives. This assumption is based on the person-in-environment model, which guides us to view problems within the context of the client and the environment.

A key factor in the delivery of social work services is cost. Our usual approach has been to address clinical efficacy and effectiveness and then recommend that cost-effectiveness be studied in future research. In the present study, we evaluated the costs of providing comprehensive case management with clients in residential drug treatment. Although our results did not support the hypothesis that case management would be cost-effective, other issues clouded these results. The primary confounding issue was the duration of the follow-up with our study participants. In Holder's work with patients treated for alcoholism, the savings in costs did not occur until the 3rd year—and these savings were for both the target patient and his or her families (Holder, 1998). Because our past follow-up point was 12 months following intake, we could not address this delayed benefit. We looked only at days without substance use. Some researchers, and social workers, argue that occasional use of some substances

(e.g., alcohol or marijuana) is an acceptable outcome if clients' lives improve in other areas. Objectively measured areas might include reduced criminal activity, more days worked, or greater earned income. More subjective outcomes might include more positive self-esteem or improved family relations.

We recommend that social work practitioners desiring to use case management as part of their practice model first determine the appropriate case management model for their patient population and for the typical problems presented. Case management models can be compared and contrasted using the criteria found in Hall et al. (2002). The major models (from largest to smallest) are the assertive community treatment approach used mainly with mental health clients, the comprehensive approach that includes counseling and outreach, the brokerage model used mainly by public agencies (e.g., county social service offices), and the monitoring (gate keeping) approach used by the managed care and insurance industries. Models also vary by philosophy (problem or strengths focus), frequency of client contact, duration of contacts with clients and breadth of services (e.g., focus on many potential problems or on a few); but these dimensions can be measured through estimates of dosage (Huber, Sarrazin, Vaughn, & Hall, in press). Sometimes, comprehensive case management (which includes outreach and counseling) is necessary, but many times only brokerage case management can be supported financially by the organization. After selecting the most appropriate model of case management for their situation, we recommend that social work practitioners collect data on dosage (i.e., how much time it took to delivery services, the schedule for delivering these services, how long services were delivered, and specifically what kinds of services were delivered?) so that cost issues can be addressed by agency accountants and university researchers (Huber, Hall, & Vaughn, 2001; Huber, Sarrazin, Vaughn, & Hall, 2003). For social work practitioners, we must emphasize the use of evidence-based interventions with our clients whenever possible. Clinical wisdom can guide us when data are not available, but studies on effectiveness and cost-effectiveness should help us identify these evidence-based interventions and lead to better methods to evaluate these models. As public and private agency budgets respond to the changing goals of funding agencies, data on effectiveness and cost-effectiveness will become even more important and possibly required in the near future. However, it is important that studies highlight various other outcomes of social work in general and case management specifically in relation to quality of life and other outcomes that are not easily translated into dollar values.

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