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Effectiveness of Different Models of Case Management for Substance-Abusing Populations

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Abstract

Case management has been implemented in substance abuse treatment to improve (cost-) effectiveness, but controversy exists about its potential to realize this objective. A systematic and comprehensive review of peer-reviewed articles (n = 48) published between 1993 and 2003 is presented, focusing on the effects of different models of case management among various substance-abusing populations. Results show that several studies have reported positive effects, but only some randomized and controlled trials have demonstrated the effectiveness of case management compared with other interventions. Longitudinal effects of this intervention remain unclear. Although no compelling evidence was found for the effectiveness of case management, some evidence is available about the (differential) effectiveness of intensive case management and assertive community treatment for homeless and dually-diagnosed substance abusers. Strengths-based and generalist case management have proven to be relatively effective for substance abusers in general. Most positive effects concern reduced use of inpatient services and increased utilization of community-based services, prolonged treatment retention, improved quality of life, and high client satisfaction. Outcomes concerning drug use and psychosocial functioning are less consistent, but seem to be mediated by retention in treatment and case management. Further research is required to learn more about the extent of the effects of this intervention, how long these are sustained and what specific elements cause particular outcomes.

Keywords

case management; effectiveness; review; substance abuse; treatment

Despite several reports of positive outcomes (Sindelar et al. 2004;Gossop et al. 2003;Simpson et al. 1999), some observations raise questions concerning the effectiveness of substance abuse treatment, such as the limited accessibility of treatment agencies (Brindis & Theidon 1997), relatively high dropout and low completion rates (Sindelar & Fiellin 2001), frequent and multiple service utilization (Thornquist et al. 2002;Cox et al. 1998), and long treatment careers (Hser et al. 1997). Due to the partial and limited successes of substance abuse treatment, this field is characterized by a constant search for new interventions that yield better outcomes and

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decreased costs (Saleh et al. 2002). Several strategies have been developed to increase access and participation and to reduce attrition from treatment, e.g. motivational interviewing, low threshold programs, client-treatment matching, and contingency management (Broekaert & Vanderplasschen 2003;Griffith et al. 2000;Miller 1996). Also, case management was implemented to improve (cost-) effectiveness of substance abuse treatment (McLellan et al. 1999;SAMHSA 1998;Brindis &Theidon 1997;Mejta et al. 1997) after it had been successfully applied among persons with psychiatric disorders.

The first implementation of case management for substance-abusing populations goes back to the beginning of the 1980s and was based on the recognition that these persons often have significant problems in addition to their substance abuse (Vanderplasschen et al. 2004). This intervention is regarded as an important supplement to traditional substance abuse agencies, since it provides an array of wrap-around services that are usually not part of standard treatment (SAMHSA 1998). Case management is generally described as a coordinated and integrated approach to service delivery, intended to provide ongoing supportive care and to help people access the resources they need for living and functioning in the community (Hall et al. 2002;Birchmore-Timney & Graham 1989).

Four models of case management are usually distinguished for working with substance abusers: the brokerage/generalist model, assertive community treatment/intensive case management, the clinical/rehabilitation model, and strengths-based case management (Vanderplasschen et al. 2004;SAMHSA 1998;Ridgely & Willenbring 1992). Although these models apply the same core functions (assessment, planning, linking, monitoring, and advocacy), they can be distinguished based on, among other characteristics, the degree of service provision, client participation, and case manager involvement (cf. Table 1)

The brokerage model is a very brief approach to case management in which case workers attempt to help clients identify their needs and broker ancillary or supportive services, all in one or two contacts (SAMHSA 1998;Stahler et al. 1995). Generalist or standard models utilize the commonly accepted functions of case management and are characterized by a closer involvement between case manager and client (Woodside & McClam 2002). Assertive community treatment assumes a comprehensive role for a team of case managers by providing assertive outreach and direct counseling services, including skills-building, family consultations and crisis intervention (Stein & Test 1980). Similarly, intensive case management applies the same principles, usually with a smaller caseload and without a team approach. Clinical or rehabilitation approaches combine resources acquisition (case management) and clinical or rehabilitation activities, which might include psychotherapy for clients and their families or teaching of specific skills (Kanter 1989). Finally, strengths-based case management focuses on clients' strengths, self-direction, and the use of informal help networks (as opposed to agency resources) (Siegal et al. 1995). It further stresses the primacy of the client-case manager relationship and applies an active form of outreach.

EVALUATION OF ITS EFFECTIVENESS

One of the first studies of case management showed that it could reduce attrition and improve both psychosocial and drug and alcohol outcomes, especially among the most problematic clients (Lightfoot et al. 1982). Willenbring and his colleagues (1991) later demonstrated the effectiveness of case management as it helped keep public inebriates engaged in treatment, stabilize their situation, improve access to service providers, reduce clinical deterioration, and provide continuity of care. On the other hand, Pearlman (1984) found case management had no effect on reducing the dropout rate among clients entering treatment, but observed a substantial increase in the proportion of persons entering treatment after intake. Other authors

(Falck, Siegal & Carlson 1992;Lidz et al. 1992) have reported few or no effects of this intervention, when compared with non case-managed control groups.

As these early studies illustrate, controversy exists about the effectiveness of this intervention, resulting in a lack of evidence about which model should be applied for what population (Vanderplasschen et al. 2004;Sorensen et al. 2003). Moreover, most publications refer only selectively to available studies, which may result in the underreporting of particular outcomes. Therefore, we made a systematic and comprehensive narrative review of available research, focusing on the effectiveness of different models of case management for various substance-abusing populations, such as mothers, dually-diagnosed persons, chronic public inebriates, HIV-infected individuals, offenders, and homeless persons.

The objectives of this intervention can be established on the client level as well as on the system level and may include ameliorating client outcomes, service utilization, clients' satisfaction, and quality of life, and improving accessibility, accountability, coordination and continuity of care, and cost containment (SAMHSA 1998;Willenbring 1996). We assessed the extent to which (models of) case management help achieve the postulated goals.

METHODS

We restricted our review to articles published in peer-reviewed journals between 1993 and 2003. Peer review was postulated as a minimal guarantee for the quality of the selected studies and 1993 seemed an appropriate starting date, since no evaluation studies were published before that date in these types of journals (Mejta et al. 1997). In order to be included, a study had to evaluate at least one model of case management, focus on substance abusers (possibly in combination with another co-occurring, but not primary, psychiatric disorder), and report at least one outcome variable. While controlled trials are generally regarded as the strongest form of evidence of treatment efficacy (Miller & Wilbourne 2002;Ziguras & Stuart 2000), we chose not to restrict our review to studies that include a comparison condition and use a procedure to yield equivalent groups before treatment (randomization), since the number of randomized and controlled studies concerning case management for substance abusers is still relatively small (Vanderplasschen et al. 2004). Moreover, this type of study is nor the sole nor the most ideal design to evaluate the effectiveness of psychosocial interventions (Koski-Jännes 2005).

We used the terms "case management", "substance abuse/drug abuse/addiction" and "evaluation/outcomes/effects/effectiveness" for computer keyword searches in the following comprehensive, but partly overlapping databases: (Social) Sciences Databases of the Institute of Scientific Information, Medline, PsycInfo, and PubMed. Further, we made hand searches of the cited references from selected articles. After eliminating double counts, 87 articles were identified that contained all three search criteria. Based on an initial analysis of the abstract and/or full text of these articles, it appeared that 38 articles were not eligible for this review because: some did not concern outcome studies, but rather an evaluation of implementation issues (n = 12); the primary focus was people with severe mental illness (n = 11); case management was part of a comprehensive intervention and the authors did not report on the effects of this intervention separately (n = 7); no outcome measure was included (n = 5); or they were review articles and the original article was already included in our review (n = 3).

A group of American and European experts examined the preliminary list of references and made suggestions for outcome studies that had been missed. One study was added that is frequently cited in peer-reviewed articles, but was only published as a research report (Rhodes & Gross 1997). The paper or electronic versions of four selected articles could not be accessed, even after contacting the principal author, and were thus not included in this study. Finally, we selected 46 articles that will be further analyzed in this article.

Peer-reviewed journals as a data source may induce a publication bias since these journals are usually edited in English (Miller & Wilbourne 2002). Consequently, evaluation studies by non-English-speaking authors may be underrepresented in the international peer-reviewed literature. Despite the increased implementation of case management in Europe (Vanderplasschen et al. 2004), we could not find any English-language articles that evaluated the effectiveness of this intervention for substance abusers on this continent. We compensate for this possible bias by including two original research reports that focused on this issue in Germany and Belgium (Oliva et al. 2001;Vanderplasschen, Lievens & Broekaert 2001).

Moreover, selection of peer-reviewed published materials may have resulted in an analysis of studies that have demonstrated significant outcomes, while insignificant or even adverse outcomes tend to remain unpublished (Rosen & Teeson 2001). To partly address this potential bias, we did not focus exclusively on studies with a rigorous design, but also included results from descriptive and retrospective studies. While reporting on the effectiveness of different models of case management, we will examine the quality of the research design (type and extent of the study) and the direction and significance of reported effects, but not the size of these effects.

RESULTS

Analysis of the selected articles (n = 48) shows that half of all studies have evaluated the effectiveness of intensive case management (n = 20) and assertive community treatment (n = 4) (cf. Table 2). Strengths-based (n = 11) and generalist case management (n = 10) have been evaluated to a lesser extent, while relatively few studies have focused on the effects of clinical (n = 2) and brokerage (n = 1) case management (cf. Table 3).

We identified several articles (n = 18) that referred to only six original studies. In total, 36 original studies were analyzed. Further, some studies have applied brokerage (n = 2) or generalist case management (n = 2) as a control condition for evaluating more specialized models of case management.

Intensive Case Management

The effectiveness of intensive case management (cf. Table 2) has been tested for assisting diverse substance-abusing populations, especially homeless and alcohol dependent persons. Although all studies (n = 5) have shown significant improvements at time of follow-up (e.g. housing status, substance abuse, psychical and mental health, quality of life, employment), only one study clearly showed that chronic public inebriates benefited more from intensive case management than from standard care (Cox et al. 1998). Significantly better outcomes were observed concerning income from public sources, nights spent in own place, and days of drinking. It was assumed that these effects were mediated by the amount of substance abuse and other services received. Also, Orwin and colleagues (1994) found some evidence for an effect of intensive case management on housing status, but only in one of three cities studied and if it was assumed that persons who dropped out of the control group deteriorated.

Homeless persons with more severe substance use histories usually showed significantly poorer outcomes (Cox et al. 1998;Stahler et al. 1995). Between-group effects were especially small in randomized clinical trials (RCTs) that compared intensive case management with comprehensive standard care (cf. Braucht et al. 1995;Stahler et al. 1995). Based on a retrospective study, Thornquist and colleagues (2002) proved that intensive case management was more cost-effective than standard care for chronic inebriates who frequently utilize emergency services and that it contributed significantly to more appropriate service utilization and reduction of health care costs.

Also, persons with severe mental illness and co-occurring substance use disorders can benefit from intensive and outreach case management (Durell et al. 1993). A comparison of the (cost-) effectiveness of three interventions— 12-Step recovery program, intensive case management, and behavioral skills training—over a 24-month period showed an impressive, though not significant, impact of the latter two interventions on the use of inpatient services, involvement with outpatient services, and total health care costs, without transferring the burden to the family or legal system (Jerrell, Hu & Ridgely 1994). Robustness of program implementation was a crucial factor, and robustly implemented case management led to improved psychosocial functioning, fewer alcohol and drug symptoms, and lower health care costs (Jerrell & Ridgely 1999;Ridgely & Jerrell 1996). Witbeck and colleagues (2000) found very similar results among a small sample of chronically addicted, mentally ill homeless individuals who made frequent use of emergency services.

The effectiveness of intensive case management for other substance-abusing populations has only been assessed in a limited number of studies. Some evidence is available that this intervention is more effective than less intensive referral contacts for reducing recidivism and increasing treatment participation among drug-involved arrestees (Rhodes & Gross 1997). Godley and colleagues (2000) found a significant reduction of legal problems and improved outcomes concerning other drug-related problems and quality of life after six months among dually-diagnosed persons involved in the criminal justice system. Overall, clients were (very) satisfied with the services received.

The application of intensive case management among HIV-infected individuals has generated rather modest results, but improved access to (medical) services and retention in the program (Rich et al. 2001). Comparison of the effectiveness of intensive and brokerage case management did not reveal many between-group differences and the initial (after six months) significant reduction of problem severity within both groups had disappeared after 12 and 18 months (Sorensen et al. 2003).

More favorable outcomes have been found for adolescent substance abusers, since program access, participation and retention and marijuana and alcohol use at three-month follow-up were significantly better among case managed adolescents (Godley et al. 2002). On the other hand, intensive family case management for infants of cocaine-abusing women only generated better outcomes on some aspects of their cognitive and verbal development, but case managed and non-case managed parents were as likely to lose custody of their children (Kilbride et al. 2000). Impressive positive results were observed at the time the intervention was stopped in an uncontrolled study with pregnant and post-partum women (Lanehart et al. 1996) and in a retrospective study of a mixed population of substance abusers (Evenson et al. 1998). Clients' situations improved across most outcome indicators (e.g. global level of functioning, substance use, employment, legal difficulties, parenting, baby's birth weight, interpersonal relations and social agency support). Better outcomes were associated with longer lengths of stay.

The implementation of intensive case management in Europe has mainly focused on multi-impaired chronic addicts and contributed to better monitoring and amelioration or stabilization of most clients' situations (Oliva et al. 2001;Vanderplasschen, Lievens & Broekaert 2001). Again, positive outcomes were related to longer retention in case management and the vast majority of clients appeared to be (very) satisfied with this type of support.

Assertive Community Treatment

More evidence is available about the effectiveness of assertive community treatment, since this intervention has only been evaluated based on RCTs. Its potential for reducing recidivism, sexual risk behavior and relapse among parolees with drug use histories differed little from that of conventional parole (Martin & Scarpitti 1993). Given the modest effects of assertive

community treatment, it was concluded that this intervention was of limited value for clients who were not merely unable to access services (Inciardi, Martin, & Scarpitti 1994).

Application of assertive community treatment among patients with dual disorders has been more successful, although few differences appeared from a comparison of the effectiveness of assertive community treatment and generalist case management over a three-year period (Drake et al. 1998). The ACT group improved more on some measures of substance abuse and quality of life, but overall both groups ameliorated equally over time on several outcome measures. Also, cost-effectiveness was equal, except that standard case management was more efficient during the first two years and assertive community treatment during the third year (Clark et al. 1998).

Strengths-Based Case Management

Although the application of strengths-based case management is limited to a few projects, some evidence of effectiveness is available based on two large NIDA-funded studies in Iowa and Ohio (cf. Table 3).

The Iowa case management study demonstrated a significant impact of case management inside a treatment facility on the utilization of medical and substance abuse services (Vaughan-Sarrazin, Hall & Rick 2000). Few differences concerning client outcomes were found, except better legal outcomes after six months and an improved employment situation after 12 months in one modality (inside case management) and reduced drug use at the three-month and decreased psychological problems at the three- and 12-month follow-up in another modality (outside case management). Moreover, these differences, especially concerning drug use, tended to decline over time (Saleh et al. 2002;Vaughan-Sarrazin, Hall & Rick 2000). A significant impact of all three modalities of Iowa case management was found on family relationships and parental attitudes after six months, but these effects were not apparent after three and 12 months (Sarrazin, Huber & Hall 2001). Face-to-face, instead of telecommunication, case management led to better outcomes (Saleh et al. 2002), although the latter group received significantly higher dosages (amount, frequency, breadth, duration) of case management (Huber et al. 2003). Telecommunication case management appeared to be most suited for persons with higher premorbid cognitive abilities (Block, Bates & Hall 2003).

In the Ohio study, Siegal and colleagues found evidence for an effect of strengths-based case management on employment functioning after six months (Siegal et al. 1996) and treatment retention, which was related to reduced drug use and improved legal outcomes (Siegal, Li & Rapp 2002;Rapp et al. 1998;Siegal et al. 1997). This intervention further contributed to after-care participation at 12-month follow-up, which was associated with less post-treatment criminality (Siegal et al. 2002). No direct impact of strengths-based case management on drug use severity could be demonstrated, but this effect was mediated by its role in enhancing treatment participation and retention (Rapp et al. 1998).

Further support for an effect on the employment situation appeared from two articles that assessed the application of strength-based principles to assist amphetamine abusers (Cretzmeyer et al. 2003) and chronically unemployed methadone clients (Zanis & Coviello 2001), respectively.

Generalist Case Management

Generalist or standard case management has been applied among similar populations as more specialized models. Some evidence has been found for an effect on homeless substance abusers, as standard residential care with additional case management (compared with standard treatment alone) led to longer treatment retention and better alcohol, medical, employment,

and housing scores for the first nine months after admission (Conrad et al. 1998). However, these effects diminished after 12 months; this result was also observed by Mercier and Racine (1993) in their study of homeless substance-abusing women. Differential between-group effects were not demonstrated in another study (Lapham, Hall & Skipper 1995), although significant within-group differences were found concerning days of alcohol use, housing stability, and employment status, especially among program graduates.

Similarly, significant effects of generalist case management concerning several aspects of psychosocial functioning were reported for cocaine-dependent mothers (Volpicelli et al. 2000). Still, women receiving psychosocially enhanced treatment including psychotherapy showed superior treatment attendance and greater reductions in cocaine use. Since a significant but fading effect on drug use after delivery was demonstrated (Eisen et al. 2000), it can be concluded that case management, particularly the availability of transportation, facilitates treatment access and retention for pregnant substance-abusing women (Laken & Ager 1996).

Mejta and colleagues (1997) demonstrated similar findings on treatment access and retention among case managed intravenous drug users, especially when case managers had money to purchase treatment. Based on this and another study (Levy, Strenski & Amick 1995), a clear but not significant between-group effect on alcohol and drug use was observed favoring the case management condition. A large retrospective study among substance abusers discharged from different treatment settings confirmed that case managed clients had significantly better retention, post-primary treatment participation and rehospitalization rates (Shwartz et al. 1997).

One Treatment Alternatives Program (TAP) that applied generalist case management was regarded as an effective intervention for offenders, since treatment completers were significantly less likely to be rearrested than treatment noncompleters (Van Stelle, Mauser & Moberg 1994). This intervention was more cost-effective than incarceration and also successful among offenders with extensive criminal records.

Brokerage Case Management

Since only one study has evaluated the effectiveness of brokerage case management, little evidence exists that this intervention contributes to treatment participation and referral to ancillary services (Scott et al. 2002). On the other hand, when a brokerage model was used as a control condition for more specialized models of case management, this intervention was not less effective for affecting client outcomes and service utilization (Sorensen et al. 2003;Stahler et al. 1995).

Clinical Case Management

Little evidence is available about the effectiveness of clinical case management, but this intervention has been associated with an increase in the provision of services and significant improvements concerning alcohol and drug use, medical and psychiatric status, and employment functioning after six months (McLellan et al. 1999). Similar outcomes were found among frequent users of emergency services, as they used significantly less emergency and inpatient services, had more primary care contacts and showed improved psychosocial functioning after being monitored by a clinical case manager (Okin et al. 2000).

DISCUSSION

This narrative review of peer-reviewed articles that have evaluated the effectiveness of case management does not show compelling evidence for the effectiveness of this intervention, although several studies have reported positive effects concerning client outcomes, service

utilization, treatment access and retention, quality of life, consumers' satisfaction, and cost savings (Vanderplasschen et al. 2005). It appears that especially descriptive, retrospective, and quasi-experimental studies have shown beneficial outcomes, while studies applying a methodologically stronger design (randomized and controlled trials) have often failed to prove the effectiveness of case management compared with other interventions, particularly over a longer period of time.

Effectiveness of Different Models of Case Management for Specific Populations

Intensive case management has mostly been applied for severely affected substance-abusing populations, such as chronic public inebriates and dually-diagnosed individuals. Although relatively few differences have been observed with control groups receiving standard or other viable treatment, significant improvements over time have been consistently reported concerning various client outcomes (Thornquist et al. 2002;Cox et al. 1998;Braucht et al. 1995;Stahler et al. 1995). Clear gains among intensively case managed clients were more appropriate service utilization, reduced health care costs and high satisfaction with the services received (Thornquist et al. 2002;Witbeck et al. 2000;Jerrell et al. 1994). However, robustness of program implementation appeared to be a decisive factor for its effectiveness (Jerrell & Ridgely 1999), while persons with extensive histories of homelessness, medical and substance abuse problems had worse outcomes (Cox et al. 1998;Stahler et al. 1995). These observations stress the importance of deliberate implementation of case management programs and their integration in the existing network of services for adequate matching and referral (Vanderplasschen et al. 2004).

Also assertive community treatment helped patients with dual disorders improve over a three-year period, but not any differently as compared to standard case management. On the other hand, some evidence is available that the latter intervention affects treatment retention and client outcomes among homeless individuals (Conrad et al. 1998;Lapham, Hall & Skipper 1995). Outcomes from both studies show that for severely affected populations, case management efforts should be sustained over long enough periods.

Offenders can benefit from intensive case management for reducing legal problems and increasing treatment participation, but assertive community treatment is only recommended for persons who are not able to access services themselves (Inciardi, Martin & Scarpitti 1994). Also, generalist case management may be a valuable intervention for this population, although program completion seems a pre-requisite (Van Stelle, Mauser & Moberg 1994). As in many other studies, retention in case management appears to be crucial and can be influenced by elements like the client-case manager relationship, comprehensiveness and flexibility of the program, assertive outreach and client-driven goal setting (Vanderplasschen & Wolf 2005;SAMHSA 1998).

Given the significant drug-related problems and numerous barriers to treatment that HIV-infected individuals experience, it may not be surprising that the effects of intensive case management are limited to improving access to medical services and increasing retention in the program (Rich et al. 2001). Significant changes in clients' situations are feasible, but difficult to maintain (Sorenson et al. 2003). Intensive case management may fill up an important gap, as linkage to services and treatment participation are often problematic among persons with HIV/AIDS (Nebelkopf & Penagos 2005).

One of the most successful experiments with intensive case management concerned adolescent substance abusers (Godley et al. 2002). Given the nature of this intervention and of adolescents' problems, this intervention may be an important instrument for providing effective continuing care and monitoring if the promising results can be confirmed at subsequent follow-up measurements.

Also, substance-abusing pregnant women and mothers have generally benefited from (intensive) case management, both concerning their psychosocial functioning and children's development and their treatment access and retention (Volpicelli et al. 2000;Laken & Ager 1996;Lanehart et al. 1996). However, no randomized and controlled study has yet shown its effectiveness compared with other interventions. Similarly, the implementation of intensive case management for multi-impaired chronic substance abusers in Europe has generated significant gains which need to be confirmed in large-scale experimental studies.

Some evidence is available for the effectiveness of strengths-based case management, as at least two studies showed significant effects on service utilization and legal and employment outcomes for persons seeking treatment (Saleh et al. 2002;Siegal, Li & Rapp 2002;Zanis & Coviello 2001;Vaughan-Sarrazin, Hall & Rick. 2000;Siegal et al. 1997,1996). Controversy exists as to whether these effects can be maintained over time (Saleh et al. 2002;Siegal, Li & Rapp 2002), although treatment retention clearly has a positive impact on clients' psychosocial functioning (Rapp et al. 1998). Given its role in addressing denial and resistance, its appreciation among clients and its potential positive effects (Brun & Rapp 2001;Zanis & Coviello 2001), it is recommended that this strengths-perspective is applied in other programs, mainly to enhance treatment participation and retention among persons with little motivation for change.

Intensive and generalist case management have not always been directed at specific groups of substance abusers. Studies of the latter consistently show an impact on treatment access, participation and retention, and relapse and rehospitalization (Evenson et al. 1998;Mejta et al. 1997;Shwartz et al. 1997;Levy, Strenski & Amick 1995). These findings illustrate what may realistically be expected from the implementation of case management, if this intervention is robustly implemented and continued during a substantial period.

Although brokerage models of case management include a very brief intervention and have been evaluated negatively among psychiatric patients, available research shows that this intervention was not always inferior to more specialized models for reducing drug-related problems and stimulating service utilization (Sorensen et al. 2003;Stahler et al. 1995). On the other hand, brokerage case management seems to affect in particular initial treatment participation and linking to services and should thus be applied for this specific purpose, e.g. at centralized intake facilities (Scott et al. 2002).

Little empirical data are available about the effectiveness of clinical case management, but results from nonexperimental studies are promising (Okin et al. 2000;McLellan et al. 1999). A combination of psychotherapy and resource acquisition can affect substance abusers' psychosocial functioning and service utilization and appeared to be more cost effective than standard treatment, particularly for frequent users of inpatient services or so-called "revolving door clients" (Sindelar et al. 2004;Okin et al. 2000). Also, intensive case management has some potential for helping persons who make disproportionate use of available services and resources (Witbeck, Hornfeld & Dalack 2000).

What makes Case Management Effective (or not)?

This review showed that many studies have failed to demonstrate a significant between-group effect favoring the case management condition, although almost all RCTs have revealed significant positive effects when compared with baseline assessments, e.g. concerning substance abuse, housing, employment, quality of life, psychological functioning, and service utilization (Witbeck, Hornfeld & Dalack 2000;Drake et al. 1998;Siegal et al. 1997;Braucht et al. 1995;Jerrell & Ridgely 1995;Lapham, Hall & Skipper 1995;Stahler et al. 1995). Without a control condition, authors may have wrongly assigned a time effect to case management, while

other factors such as motivation, retention, and client characteristics may have accounted for these positive outcomes.

Other authors have suggested “spontaneous remission” or “regression to the mean” to explain effects, since most substance abusers start with case management at a very low level in their functioning and a certain degree of improvement may be part of the natural course of substance abuse problems (Braucht et al. 1995;Lapham, Hall & Skipper 1995;Stahler et al. 1995). Both hypotheses have been rejected based on the observation that persons receiving less intensive services show far less improvement.

According to Orwin and colleagues (1994), the lack of evidence for the differential effectiveness of case management may have more to do with the way it is evaluated than with the intervention itself. Treatment that has been compared primarily with other viable treatment —not with minimal or no treatment—may seem less effective since the latter studies have usually found (more) significant differences (Miller & Wilbourne 2002). Generally, models of case management have been compared with control conditions that include standard treatment, another innovative intervention or another model of case management, thus reducing the chance of observing significant differential effects. Also, other sources of bias may have obscured the differential effectiveness of this intervention.

First, bias may occur due to lower attrition rates in the case management group (Vaughn et al. 2002;Kilbride et al. 2000;Drake et al. 1998). Due to the nature of the case management process itself, case managers can track even the most difficult cases that would normally be lost at follow-up when receiving standard treatment (Orwin et al. 1994).

Second, partial or incomplete implementation and low intensity of the intervention due to staffing problems, lack of training and inexperience of case managers, and staff turnover may account for limited or no effectiveness (Orwin et al. 1994). Robustness of implementation can be optimized by intensive initial training, regular supervision, administrative support, application of protocols and manuals, treatment planning and a team approach (Jerrell & Ridgely 1999). Since McLellan and colleagues (1999) could only demonstrate the effectiveness of a case management program 26 months after initial implementation, they further stressed the importance of precontracting of services to ascertain their availability and accessibility. Usually much shorter periods are adhered to for piloting and fine-tuning new programs, which may result in a lack of or underestimation of particular effects (Lapham, Hall & Skipper 1995).

Third, differential effects between groups can hardly be demonstrated if the comparison group receives more services than planned or if other programs or the control condition adopt principles of the innovative intervention (Drake et al. 1998;Orwin et al. 1994). From an ethical and practical point of view, it may be unwarranted to keep a potentially effective intervention from individuals in need of it (especially high-risk populations), and this might invite other caregivers to provide similar services (Inciardi, Martin & Scarpitti 1994). The drift of one intervention toward another can also happen in the opposite direction, when experimental conditions begin to resemble the comparison group as case managers settle into their jobs and lose their initial enthusiasm (Ridgely & Willenbring 1992).

Finally, despite the fact that results from experimental studies concerning case management have been biased to a certain extent, it is unlikely that case management and its particular models are significantly more effective than other interventions for substance abusers. Perhaps this should not be surprising, since this intervention was originally designed to provide ongoing and supportive care to clients and to link them with community resources and existing agencies (Rapp et al. 1998;Birchmore-Timney & Graham 1989). Expecting to also have significant and lasting effects on clients’ functioning has probably been too optimistic an objective.

Limitations of the Review

Despite numerous empirical studies that have evaluated case management, no comprehensive review has yet been published about the effectiveness of this intervention for substance abusers. This review may contribute to present-day knowledge about the effectiveness of this intervention and to its further implementation, and can be the starting point for a meta-analysis. However, some shortcomings should be kept in mind concerning the methodology of this review.

First, this review was based on articles published in peer-reviewed journals, which may have caused a publication bias (cf. supra). Since we found various and inconsistent effects and several studies that reported insignificant effects, we assume that our review was not merely affected by such a bias. It can also be that published articles only contain the strongest findings of a study, while other insignificant observations were not reported. Analysis of the original research reports and data could address this problem, but this information is usually difficult to access at the expense of its comprehensiveness and quality.

Second, this review started from four different models of case management that have been accepted by a consensus panel of American specialists (SAMHSA 1998). Due to contextual differences and lack of program fidelity, most of the practical applications of case management only vaguely resemble the pure version of each model (Vanderplasschen et al. 2004;Jerrell, Hu & Ridgely 1994). Articles were grouped according to the model applied, based on authors' information about which case management model was used. If insufficient details were given about the actual intervention or no specialized model was mentioned, these interventions may have been incorrectly classified as generalist case management. Indicators to measure program fidelity and robustness of different models of case management are needed, as well as an accurate description of the implemented intervention (Godley et al. 2000;Teague, Bond & Drake 1998).

Finally, contextual differences affect the implementation—and consequently the evaluation—of case management to a large extent (SAMHSA 1998). Due to the differing organization of social welfare and health care systems in the United States and Europe, it can be questioned whether the results from these predominantly American studies can be easily transferred to the European situation (Wolf, Mensink & Van der Lubbe 2002;Oliva et al. 2001). Available findings from European studies suggest similar outcomes, but further evaluation is needed to generalize these results.

Recommendations for Further Research and Practice

Any firm conclusions about the effectiveness of case management are premature and even unwarranted, given the relative scarcity of randomized and controlled studies, especially concerning some specific models of case management (clinical, brokerage, and strengths-based). Additional studies are needed, mainly outside the United States, that apply a strong methodology among a sufficiently large sample. Small samples have accounted for limited power and reduce the chance of detecting small or medium effects (Orwin et al. 1994).

The lack of longitudinal scope in most studies debilitates any conclusion about the long-term effects of this intervention. Most of the selected studies have applied case management interventions that do not last longer than six to 12 months, and clients were usually not followed up for more than six months after termination of the program. Studies that have utilized case management over a 24- to 36-month period have demonstrated long-term positive effects and even cost-effectiveness (Oliva et al. 2001;Jerrell & Ridgely 1999;Clark et al. 1998;Drake et al. 1998;Lanehart et al. 1996;Levy, Strenski & Amick 1995). However, some authors have shown that effects plateaued or even deteriorated after a while, particularly when the

intervention was discontinued (Sorensen et al. 2003;Zanis & Coviello 2001;Conrad et al. 1998;Mercier & Racine 1993). Given the chronic and relapsing nature of substance abuse problems, application of a longitudinal approach to case management is indicated. It is necessary to know if its value declines over time and when, if ever, case management efforts should be reduced or terminated (Clark et al. 1998). The combination or alternation of intensive and less intensive interventions from a chronic care perspective (including case management) may yield the best results.

Evaluations of the effectiveness of case management should include multiple outcome measures and process variables. Not only socially acceptable changes (e.g. drug use, employment, criminal behavior) should be studied, but also indicators concerning quality of life and clients' subjective perceptions, since such changes may be as important for society (Sindelar et al. 2004). Up to now, little information has been available about the crucial features of this intervention: what specific aspects contribute to specific outcomes? Since the identification of these elements has been defined as the most important future research issue in the field of mental health care, insights from this field should be closely followed (Burns et al. 2001). A team approach, monitoring, treatment planning, outreaching, and focusing on strengths and good relationships with case managers have been associated with positive outcomes among substance abusers (Vanderplasschen et al. 2004;Brun & Rapp 2001;Jerrell & Ridgely 1999). In-depth qualitative research with clients and case managers is required to further explore elements that contribute to the effectiveness of case management. The general nature of the elements identified in qualitative studies can then be tested in randomized and controlled trials.

CONCLUSION

Based on this review of published articles, the authors conclude that at least some evidence is available for the effectiveness of some models of case management. These effects are small or modest at best and do not differ significantly from those of most other interventions in the field of substance abuse treatment. As in the field of mental health care, obvious positive effects include reduced use of inpatient services and increased utilization of outpatient and community-based services, prolonged treatment retention, improved quality of life, high client satisfaction, and stabilization or even improvement of the situations of—often problematic—substance abusers. Retention in and completion of case management programs have consistently been associated with positive outcomes, but overall effects concerning clients' functioning are less consistent. Various authors have found significant effects over time for several drug-related outcomes, but often these did not differ from outcomes among clients receiving less intensive or even minimal interventions. Longitudinal outcomes are still unclear, but at least some studies have shown long-term effects if the intervention was sustained.

Several aspects of the effectiveness of this intervention need to be studied further. The extent of the effects was beyond the scope of this article, but should be included in a meta-analysis concerning the effectiveness of case management for substance abusers. Although some studies have shown that this intervention works, it is still unclear what exactly makes this intervention work and how long its effects last. Given the increased acceptance of the idea that substance abuse is a chronic and relapsing disorder, the role of case management should be discussed from a chronic care perspective. Ultimately, the effectiveness of this intervention for affecting clients' functioning should not be overestimated; its effect primarily lies in supporting clients in their daily lives and linking them to adequate services. Providing direct services or psychotherapy as part of case management may contribute more substantially to the stabilization or improvement of clients' situations, but such support probably needs to be sustained over time to produce long-term effects.

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TABLE 1

Main Characteristics of Distinguished Models of Case Management*

[[|]] [[|]]	[[|]]	[[Models|]]	[[|]]	[[|]]
[[Characteristics|]]	**Brokerage and Generalist Case Management**	**Assertive Community Treatment and Intensive Case Management**	**[[Strengths-Based Case Management|]]**	**[[Clinical Case Management|]]**
[[Discriminating characteristic|]]	[[Coordination|]]	[[Comprehensive approach|]]	Stress on strengths and empowerment	Case manager as role-model and therapist
[[Outreaching|]]	[[No|]]	[[Yes|]]	[[Yes|]]	[[Yes|]]
Importance of client-case manager relation	[[Somewhat important|]]	[[Important|]]	[[Important|]]	[[Very important|]]
Coordination or service provision	Coordination, little or no service provision	[[Service provision|]]	Service provision and coordination	Service provision and coordination
Service provision at home	[[No|]]	[[Yes|]]	[[Yes|]]	[[Yes|]]
Case worker's or team responsibility	[[Case worker|]]	[[Team|]]	[[Case worker|]]	[[Case worker|]]
[[Multidisciplinary team|]]	[[No|]]	[[Yes|]]	[[No|]]	[[No|]]
Growth or stabilization stabilization of clients	[[Rather stabilization|]]	[[Growth|]]	[[Growth|]]	[[Rather|]]
Paternalism or paternalism Empowerment	[[Rather empowerment|]]	[[Paternalism|]]	[[Empowerment|]]	[[Rather|]]
[[Average Caseload|]]	[[35|]]	[[15|]]	[[15|]]	[[10|]]

* Vanderplasschen & Wolf 2005.

TABLE 2

Overview of Studies That Reported Effects of Intensive Case Management and Assertive Community Treatment Among Substance Abusing Populations (N = 24)

Model of Case Management	[[Target Population|]]	Study Design + Intervention	[[Authors|]]	[[Main Effects Reported|]]
Intensive case management (ICM)	[[Homeless persons|]]	Partially randomized and controlled trial (n = 930) ICM compared with standard care	Orwin et al. 1994	ICM more effective for improving housing (S) + substance abuse and employment outcomes (NS) at one of three sites after nine months.
[[|]]	[[Homeless persons|]]	Randomized and controlled trial (n = 323) Standard treatment compared with condition with additional ICM	Braucht et al. 1995	Small differences between both groups (NS), but significant improvement within groups concerning substance abuse, housing status, physical and mental health, employment and quality of life after 4 and 10 months.
[[|]]	[[Homeless males|]]	Randomized and controlled trial (n = 722) ICM compared with two conditions of standard care	Stahler et al. 1995	No between-group differences, but significant improvements concerning cocaine and alcohol use, employment and housing at six-month follow-up.
[[|]]	Homeless chronic public inebriates	Randomized and controlled trial (n = 193) ICM compared with standard treatment	Cox et al. 1998	Both groups improved over time, favoring ICM-group on total income from public sources, nights spent in own place and days of drinking after 24 months (S). ICM-group received more substance abuse and other services (S).
[[|]]	[[Chronic inebriates|]]	Retrospective study (n = 92) Comparison of two programs of standard care and ICM	Thornquist et al. 2002	Reduction in median number of detox and medical visits (S) and of medical and total health care charges (S) in ICM-group after 24 months. ICM was most cost-effective.
[[|]]	[[Dually diagnosed persons|]]	Uncontrolled pre-post test (n = 84)	Durell et al. 1993	Modest reduction of substance abuse problems and changing pattern of service utilization (NS).
[[|]]	[[Dually diagnosed persons|]]	Partially randomized and controlled trial (n = 143) ICM compared with two other interventions	Jerrell et al. 1994 Ridgely & Jerrell 1996 Jerrell & Ridgely 1999	All three interventions led to reduced use of (sub)acute services and increased involvement with outpatient and community-based treatment after 24 months (S). ICM-group had highest satisfaction with quality of life, most substance abuse symptoms, lowest costs of mental health services + lowest burden for family (NS). Robust ICM associated with higher rates of psychosocial functioning, less alcohol and drug symptoms and lower cost of intensive services (S).
[[|]]	Dually diagnosed homeless persons	Randomized and controlled trial (n= 18) ICM compared with standard care	Witbeck et al. 2000	Significant decrease of utilization of emergency and ambulance services. Substantial cost-savings and enhanced recovery and psychosocial functioning after 12 months (NS).
[[|]]	[[Drug-involved arrestees|]]	Randomized and controlled trial (n = 1400) ICM compared with two less intensive control conditions	Rhodes & Gross 1997	Reduced drug use at one site and less recidivism and increased treatment participation at both sites after six months (S). Reduction of injecting and sexual risk behavior not different between groups (NS).
[[|]]	Dually diagnosed persons involved in the criminal justice system	Uncontrolled pre-post test (n = 54)	Godley et al. 2000	Reduced legal problems at six-month follow-up (S) + also other drug-related problems improved (NS). Generally very satisfied with the program.
[[|]]	Adolescents in residential treatment	Randomized and controlled trial (n= 114) Standard treatment compared with condition with additional ICM	Godley et al. 2002	No between-group differences concerning length of stay and treatment completion, but ICM-condition more likely to initiate and receive continuing care services (S) and to be abstinent from marijuana and less days of alcohol use three months after discharge (S).
[[|]]	Pregnant and post-partum women	Uncontrolled pre-post test(n= 152)	Lanehart et al. 1996	Significant improvements across all outcome indicators after six months. Longer length of stay associated with more drug-free days (S).
[[|]]	Infants of cocaine abusing women	Non-randomized, controlled study (n = 70)	Kilbride et al. 2000	Few between-group differences, except that ICM-infants had better cognitive

Model of Case Management	[[Target Population|]]	Study Design + Intervention	[[Authors|]]	[[Main Effects Reported|]]
		Comparison of ICM and routine follow-up		outcomes after six months and better verbal scores after 36 months(S).
[[|]]	[[Persons with HIV/AIDS|]]	Randomized and controlled trial (n= 190) ICM compared with brokerage CM	Sorensen et al. 2003	Both groups improved equally over time (NS), except more sexual risk behavior in BCM-group (S). Significant reduction of problem severity after six months, but no longer after 12 and 18 months.
[[|]]	HIV-positive persons released from prison	Uncontrolled pre-post test (n = 97)	Rich et al. 2001	High rate of participation and retention in the 18-month program and utilization of related services. Intervention perceived as beneficial by most clients.
[[|]]	[[Persons in treatment|]]	Retrospective study of comprehensive program including ICM (n = 280)	Evenson et al. 1998	Positive outcomes across almost all areas affected by substance abuse after 10 months (S). High degree of satisfaction with treatment services. Longer length of stay associated with better outcomes (NS).
[[|]]	[[Multi-impaired chronic abusers|]]	Uncontrolled pre-post test (n = 1660)	Oliva et al. 2001	Overall situation of clients improved or was stabilized after 12 months. Positive outcomes were related to longer retention. Most clients very satisfied (74.2%) or satisfied (21.5%) with the intervention.
[[|]]	Persons with multiple and complex problems	Uncontrolled pre-post test (n = 24)	Vanderplasschen et al. 2001	Reduction of substance use, legal, employment and family problems after 12 months (S).
Assertive Commnity Treatment (ACT)	Parolees with history of drug use and HIV-risk behaviour	Randomized and controlled trial (n = 258) ACT compared with standard intervention	Martin & Scarpitti 1993 Inciardi et al. 1994	Few and modest differences between both groups after six months (NS). Length of treatment related to self-report of weekly drug use (S).
[[|]]	[[Dually diagnosed persons|]]	Randomized and controlled trial (n = 203) ACT compared with standard CM	Drake et al. 1998 Clark et al. 1998	Substantial improvements in both groups over 36 months concerning treatment retention, substance abuse and stable days in community (S). ACT-group showed greater improvement on some measures of substance abuse and quality of life (S), but equivalent outcomes on most other indicators. No difference in cost-effectiveness over three-year period when focusing on substance abuse and quality of life (NS).

TABLE 3

Overview of Studies That Reported Effects of Strengths-Based, Generalist, Brokerage and Clinical Case Management Among Substance Abusing Populations (N = 24)

Model of Case Management	[[Target Population|]]	Study Design + Intervention	[[Authors|]]	[[Main Effects Reported|]]
Strengths-based case management (SBCM)	[[Veterans seeking treatment|]]	Randomized and controlled trial (n = 632) Standard treatment and aftercare compared with additional SBCM	Siegal et al. 1996 Siegal et al. 1997 Siegal, Li & Rapp 2002 Rapp et al. 1998	SBCM: led to additional improvement concerning employment situation (S). Positive relation between length of time in treatment and outcomes (S). SBCM: additional improvement concerning drug use and self-help group attendance after six months (S). SBCM-clients stayed longer in after-care services (S), which was related with better outcomes concerning post-treatment criminality and drug use at 12-month follow-up (S). SBCM had no direct impact on drug use severity, but indirectly mediated by treatment retention.
[[|]]	Persons admitted in residential treatment	Randomized and controlled trial (n = 662) Standard treatment control condition compared with three modalities of SBCM: inside the facility, in social agency, telecommunication model	Vaughan-Sarrazin, Hall & Rick 2000 Sarrazin, Huber & Hall 2001 Saleh et al. 2002 Block, Bates & Hall 2003 Huber et al. 2003	Substance abuse improved after 12 months (S), but no differences between modalities (NS). SBCM had significant impact on perceptions of family relations and parental attitudes after six months (S), but not on perception of partner abuse Inside SBCM: significant impact on utilization of medical and substance abuse services after 12 months. Telecommunication CM: better outcomes for clients with higher premorbid cognitive abilities (S). Dosage of SBCM differed across modalities (S), favoring telecommunication CM (greater breadth and frequency of services).
[[|]]	[[|]]	[[|]]	Cretzmeyer et al. 2003	No different outcomes between methamphetamine abusers and clients reporting primary abuse of other drugs (NS).
[[|]]	[[Chronically unemployed MMT-clients|]]	Case study (n = 10)	Zanis & Coviello 2001	Positive effects on employment outcomes at eight-month follow-up, but discontinuation of SBCM after six months led to unemployment in three cases. SBCM regarded as effective and valuable intervention by participants.
Generalist case management (GCM)	[[IV drug users|]]	Randomized and controlled trial (n= 316) GCM compared with standard referral services	Mejta et al. 1997	GCM-group: better access to and longer retention in treatment (S). GCM: better treatment outcomes, including reduced alcohol and drug use after 36 months (NS).
[[|]]	[[IV drug users|]]	Randomized and controlled trial (n = 200) GCM compared with standard referral services	Levy, Strenski & Amick 1995	Drug use markedly decreased after 36 months among GCM-group (NS) and to a lesser extent among the control group.
[[|]]	[[Homeless women|]]	Retrospective study (n = 25) GCM	Mercier & Racine 1993	GCM led to improved or stabilized living conditions for most clients after 12 months, but acquisitions not maintained over time (36 months). Deterioration related with physical and mental health problems.
[[|]]	[[Homeless alcohol abusers|]]	Randomized and controlled trial (n= 469) Standard care and additional GCM compared with two control conditions	Lapham, Hall & Skipper 1995	Significant within-group (alcohol use, housing, employment), but no between-group differences at 10-month follow-up. Program graduates had more favorable outcomes than dropouts (S).
[[|]]	[[Homeless veterans|]]	Randomized and controlled trial (n = 358) Standard residential care compared with condition with additional GCM	Conrad et al. 1998	Both groups improved over time (S), but GCM-group had better outcomes concerning medical, alcohol, employment and housing status at 24-month follow-up (S); however, effects were mainly observed in the first year and diminished during the second year.
[[|]]	[[Pregnant women|]]	Retrospective study (n = 225)	Laken & Ager 1996	GCM helped to overcome barriers to treatment and to promote retention after 18 months (S). GCM, including availability of transportation, correlated with treatment attendance and retention (S)
[[|]]	[[Cocaine dependent mothers|]]	Randomized and controlled trial (n = 84)	Volpicelli et al. 2000	Psychosocial functioning and cocaine use improved among both groups after 12 months (S), but higher program retention and less

Model of Case Management	**[[Target Population|]]**	**Study Design + Intervention**	**[[Authors|]]**	**[[Main Effects Reported|]]**
		GCM compared with comprehensive treatment, including psychotherapy		cocaine use in comprehensive treatment condition (S).
[[|]]	Pregnant and post-partum women	Quasi-experimental study (n = 658) Community-based programs (including GCM/ day treatment) compared with standard care	Eisen et al. 2000	CM-programs had lower prevalence of any illicit drug use and crack use 30 days after delivery (S), but these outcomes were not maintained 6 months after delivery. Outcomes mediated by amount of drug abuse prevention and education.
[[|]]	[[Offenders|]]	Retrospective study (n=259) GCM in Treatment Alternatives Program	Van Stelle, Mauser & Moberg. 1994	Rearrest and reconviction rates significantly higher among noncompleters than among program completers at 18-month follow-up. GCM more cost-effective than incarceration (NS).
[[|]]	Persons discharged from treatment	Retrospective study (n = 21,207) GCM after discharge from treatment	Shwartz et al. 1997	CM-clients stayed longer in treatment and were less likely to be readmitted to detox after discharge (S). CM-clients followed more often post-primary treatment (S). Length of stay correlated with improved outcomes (S).
Brokerage case management (BCM)	Persons presenting at a centralized intake unit	Randomized and controlled trial (n = 692) BCM compared with no case management	Scott et al. 2002	CM-group was more likely to show up for treatment and received more referrals to ancillary services (S), but no differences in number of services and length of substance abuse treatment.
Clinical case management (CCM)	Persons in outpatient treatment	Quasi-experimental study (n = 537) CCM compared with standard outpatient treatment	McLellan et al. 1999	Wave 1 (12 months after implementation): within-group improvements concerning substance use, psychiatric and family problems after six months (S); but no between-group differences. Wave 2 (26 months after implementation): CCM-group received more medical (S), alcohol, employment and legal services (NS) and had significantly better alcohol, drug, medical, psychiatric + employment status after six months.
[[|]]	[[Revolving door clients|]]	Pre-post test design (n = 53) Intensive CCM	Okin et al. 2000	Reduction of ED visits and health care costs + number of outpatient visits increased 12 months later (S). Reduction of homelessness, alcohol use and drug use (S). Increased linkage to primary care and outpatient services, reduced utilization of acute and ED services and reduction in hospital costs (S).