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Beyond Bricks and Mortar: Recent Research on Substance Use Disorder Recovery Management

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Abstract

Scientific advances in the past 15 years have clearly highlighted the need for recovery management approaches to help individuals sustain recovery from chronic substance use disorders. This article reviews some of the recent findings related to recovery management: a) continuing care, b) recovery management checkups, c) 12-step or mutual aid, and d) Technology-based interventions. The core assumption underlying these approaches is that earlier detection and re-intervention will improve long-term outcomes by minimizing the harmful consequences of the condition and maximizing or promoting opportunities for maintaining healthy levels of functioning in related life domains. Economic analysis is important because it can take a year or longer for such interventions to off-set their costs. The article also examines the potential of smartphones and other recent technological developments to facilitate more cost-effective recovery management options.

Keywords

Substance Use Disorders; Continuing Care; Recovery Management; Self-Help; Technology; Smartphone

Introduction

Numerous studies have demonstrated that on-going monitoring and early re-intervention are key to successfully managing a variety of chronic conditions. Fundamental to these approaches is that earlier detection and re-intervention will improve long-term outcomes by minimizing the harmful consequences of the condition and maximizing or promoting

opportunities for maintaining healthy levels of functioning in related life domains. This article we focus on recent advances over the past several years in: a) continuing care, b) recovery management checkups, c) self-help or peer support research and d) technology-based interventions.

Continuing Care

A seminal review of addiction continuing care research, [1] found mixed evidence for the effectiveness of post addiction treatment continuing care. Continuing care approaches that performed better than average were characterized as more adaptive, were of longer duration, and used motivational incentives to increase participation. Since the 2009 review, several major evaluations of continuing care have been published that are reviewed below: four with adults and two with adolescents.

In the first experimental study, researchers randomly assigned 104 adults discharged from residential treatment to either telephone-based continuing care or to continuing care as usual (referral to outpatient treatment and self-help) [2]. Telephone-based continuing care was associated with significantly more abstinent days and with fewer substance use disorders (SUD) symptoms in the first 3 months post-discharge, with larger effects for those with low SUD severity. However, these differences dissipated over 4 to 6 months after continuing care ended.

In a second study, researchers randomly assigned 320 adolescents to either Motivational Enhancement Therapy/Cognitive Behavior Therapy-7 session model (MET/CBT7) or to treatment as usual (TAU) and, within each treatment type, to either Assertive Continuing Care (ACC) or no formal continuing care [3]. TAU did slightly better than MET/CBT7 in terms of the subsequent percentage of days abstinent; however, TAU was less cost effective in terms of cost-per days of abstinence. Unlike earlier experiments showing a benefit for ACC after residential treatment, adding ACC after outpatient did not produce additional benefits over no formal continuing care in the second part of the experiment overall; nor was it more effective after either of the specific types of outpatient treatment.

A third experimental study randomly assigned 195 cocaine dependent clients completing at least two weeks of intensive outpatient to either telephone based continuing care with voucher incentives for participation or to telephone based continuing care without incentive vouchers [4]. Incentivized patients completed significantly more continuing care sessions than those who were not incentivized (15.5 vs. 7.2 sessions). While this did NOT result in significant differences in abstinence by condition overall, among the subset who used cocaine, those receiving continuing care were significantly more likely to be abstinent[5]. [The authors concluded that continuing care should be targeted towards more severe clients who would otherwise have worse outcomes.

Fourth, a longitudinal study with 1,124 SUD adults who were discharged from residential treatment examined the impact of participation in Hazelden's My Ongoing Recovery Experience (MORE) continuing care program [6]. Unlike many earlier continuing care models, MORE delivers assessment, clinical content resources and activities over the

internet using mixed media that includes 7 formal modules, linkage to online meetings, to Hazelden's alumni network and to other resources. The number of MORE modules completed was associated with higher rates of abstinence; however most clients did not access the system, a challenge that is well documented and consistent with the broader literature on implementation science [7, 8].

In a fifth study, researchers randomly assigned 337 adolescents discharged from residential treatment to one of four types of continuing care: ACC, Contingency Management (CM), both ACC and CM, or usual care (i.e., referral to outpatient treatment and self-help and neither ACC or CM) [9]. ACC and CM were each associated with significantly higher number of abstinent days and with a greater likelihood of being in SUD remission (no use or symptoms while living in the community) at the 12 month follow-up compared to usual care. Receiving a combination of both interventions, however, was not as effective as either intervention alone.

In a sixth study, researchers randomly assigned 152 adults entering Intensive outpatient (IOP) to receive up to 30 concurrent continuing care sessions by phone or in person over 12 months, or no concurrent continuing care [10]. Contrary to expectations, IOP alone outperformed IOP plus continuing care on urine toxicology, self-reported days of cocaine use and the percentage of days abstinent. The researchers concluded that a key problem may have been the lack of integration between IOP and concurrent continuing care.

Taken together, these studies suggest that continuing care is more effective for low to moderate SUD severity clients discharged from residential treatment but less effective with both higher severity clients in residential treatment (consistent with earlier findings) and lower severity clients in outpatient (newer findings). Second, simply adding an additional intervention did not automatically improve outcomes and in some cases, reduced effectiveness. Third, the findings summarized above demonstrated the feasibility of using incentives to improve implementation and adherence to continuing care participation, which is an on-going challenge across studies.

Recovery Management Checkups

The initial Recovery Management Checkup (RMC) model [11] was based on the theory that long-term monitoring through regular checkups and early re-intervention will facilitate early detection of relapse, reduce the time to treatment re-entry, and consequently, improve long-term outcomes. This approach does not rely on participants to identify their symptoms and seek help. Rather, these regularly scheduled checkups are pro-active; they include quarterly assessments and personalized feedback for participants on the status of their SUD recovery and risks. RMC relies on linkage, engagement, and retention protocols to help participants secure the care and the recovery support they need over extended periods of time. While the initial model proved effective, subsequent work was able to greatly improve identification, initiation and engagement in treatment and consequently outcomes [12]. The following focuses on second and third generations of RMC related studies.

In a second RMC experiment following the 2003 study, researchers randomly assigned 446 SUD adults presenting to community-based treatment to either quarterly RMC or to a control group (interviews only) for 4 years [12–14]. Using *motivational interviewing*, Linkage Managers met with participants in the RMC condition to: a) provide them with feedback regarding their current substance use and related problems, b) discuss implications of managing addiction as a chronic condition, c) discuss treatment barriers and strategies to access care, d) assess and discuss level of motivation for treatment, e) schedule treatment appointments, f) accompany participants to treatment intake and stay through the process, and g) implement an Engagement and Retention Protocol during the 14 days of treatment.

Over the course of the 4 year follow-up, RMC participants were significantly more likely than those in the control condition to receive any treatment and return to treatment sooner; moreover, the size of these effects increased over time with repeated exposures to RMC. RMC participants also reported significantly more total days of abstinence and fewer past-month SUD symptoms over the course of the 4 year study and at the last observation than did controls.

In a third RMC experiment, researchers randomly assigned 480 women offenders released from Cook County jail to the community to receive either Recovery Management Checkups for Women Offenders (RMC-WO) or to a control group (interviews only) [14]. Given the high potential for relapse and recidivism in the 90 days post-release, the initial frequency of checkups in RMC-WO was increased to 30, 60, and 90 days post-release (instead of quarterly only) and quarterly thereafter for 3 years post-release. To address the high rates of HIV risk behaviors (that were associated in turn, with higher rates of substance use and crime), the RMC-WO model was expanded to include an HIV intervention component: A gender-specific HIV intervention was added to the existing RMC model. A criminal thinking component was also added to further address the high risk of recidivism. During the first 90 days post-release from jail, women offenders assigned to RMC-WO were significantly more likely to return to treatment (55% vs. 45%, OR=1.53, $p<.05$) than were female offenders in the control group: Women who received any treatment in the first 90 days post release were significantly more likely than women who did not receive any treatment to be abstinent (OR=3.74). There was an indirect effect of RMCWO (via increased treatment) but no direct effect on abstinence. Women who were abstinent were in turn, significantly more likely than those who were not abstinent to engage in fewer HIV-risk behaviors (i.e., to avoid needle use (OR=8.02), unprotected sex (OR=2.7), illegal activity (OR=6.6) and to be re-arrested (OR=3.58)) [14]. Here there were indirect effects of treatment (via achieving abstinence) and RMC-WO (via treatment and abstinence), but no direct effects for either.

In a fourth experiment, researchers randomly assigned 100 heroin addicts discharged from residential rehabilitation programs in China to either a Recovery Management intervention followed by Methadone Maintenance Treatment if they relapsed (RMI-MMT) or standard care (strength assessment and monitoring only)[15]. While the study was low in power ($n=50$ per condition) and of short duration (3 month follow-up), recovery management was associated with a trend towards increased participation in methadone maintenance (8% vs. 0%, $p=0.06$; $d=0.42$) and employment (33% vs. 2%, $p=.001$, $d=0.88$), and with decreased recidivism due to relapse (0% vs. 6%, $p=.08$; $d=0.35$) relative to standard care.

During the past few years RMC research has also been expanded to examine its cost, cost-effectiveness, and benefit-cost. Economic analyses [13, 16] showed that it costs an average of \$177 per quarter to conduct a research follow-up and \$321 to conduct the follow-up *and* RMC (a marginal cost of \$144 per quarter for RMC alone). Because the full RMC was not needed every quarter, the average cost of the RMC intervention over 4 years was \$2,184, and was similar to a single episode of care. In terms of incremental cost-effectiveness, RMC cost \$23.38 per additional day abstinent and \$59.51 per reduced substance-related problem. Note that the cost of the RMC intervention was completely offset by reductions in the costs to society for health care utilization (including SUD treatment), other social services, employment and criminal activity (including costs to the victim) by -\$1,671 per person over 4 years. Even if we replace the estimate of the cost of crime (that includes some large intangible costs to the victim) with just the hard service costs associated with arrest, probation/parole and incarceration, the offset is still -\$98 per person over 4 years, suggesting that RMC is not only effective for the individual but also cost-effective for society.

In sum, these recent studies of RMC and various adaptations replicated earlier findings of effectiveness, but also clearly demonstrate that its effects on abstinence and other problems are mediated by the extent to which treatment participation is achieved. They also illustrate that it may take up to 2 years for the increased treatment participation to reach a sufficient level that we can observe direct effects on these secondary outcomes and/or cost-effectiveness. This emphasizes the importance of using indirect effect models in short term studies and of conducting longer term studies when looking for direct effects.

Self-Help

Two of the key aims of chronic care models are to help patients learn how to self-manage their condition and to get support from peers to supplement and solidify gains from formal episodes of care. Self-help or mutual aid groups are the longest running and most frequently used mechanism of recovery support in the US [17]. For SUD, there is a growing, rich and diverse tradition of self-help programs that includes 12 step fellowships such as Alcoholics and Narcotics Anonymous, Rational Recovery, Women for Sobriety, Moderation Management and Life Ring [18–22] as well as a growing menu of community-based and often peer-based recovery support programs delivered in a broad variety of venues, such as recovery homes, mega churches, recovery schools and collegiate recovery programs and recovery centers [23]; for additional details on emerging recovery models especially peer based models, see [24].

Several recent studies continue to suggest that participation in self-help groups reduces substance use for adults [25], emerging adults [26][27] and adolescents [28], including studies using follow-ups periods of 9 years or longer [29, 30]. Recent studies have also examined the mechanisms of action underlying the demonstrated effects of 12-step participation on substance use outcomes [31]; adaptive social network changes [32], spirituality [33, 34] and having a sponsor [35] were found to partially mediate the effects of 12-step meeting attendance on substance use. These analyses and the most recent review [36] suggests that attendance alone (e.g., days of meeting attendance) may be less predictive than the degree of involvement in self-help activities (e.g., reading recovery literature,

meditation, working steps, sharing in meeting, having a sponsor, talking outside of meeting, doing service) as assessed in a new generation of measures [37–39]. While the quality of measurement and analytic rigor continue to improve in this area, it is important to acknowledge that most of the knowledge base on self-help to date remains observational.

Technology Assisted Recovery Management

As the nation strives to reduce healthcare costs while promoting health and wellness, the development of practical, effective and cost-effective SUD recovery management strategies is vital. This is particularly important for the 90% of individuals needing treatment who don't receive it [40], as well as for those who have had treatment and relapsed. One promising tool that provides for frequent ongoing monitoring and immediate access to interventions is information and communication technology (ICT). ICT encompasses technologies such as the Internet, wireless communications, and other media that unify computer processing and social networking. ICTs provide a number of options for monitoring, self-managing, and providing immediate access to interventions. Interest in these new technologies is rapidly growing among both practitioners and researchers. Multiple examples already exist of computer-based interventions [41–43] and continuing care [6], and the *Journal of Substance Abuse Treatment* recently devoted a special issue to scientific research on Technology-Based Interventions for the Treatment and Recovery Management of Substance Use Disorders [44]. Reviews of the emerging literature have generally concluded that computer-, web-, and text- based SUD interventions for treatment and recovery promotion are cost-efficient, easily accessible and effective methods for the motivation, engagement, and treatment of drug-dependent individuals, but can face implementation challenges [45]. While much of this research is still in the early stages, technology continues to move ahead and recent reviews focus on the even greater potential of applying smartphone technology to provide recovery management anytime anywhere as potentially significant [46].

In a recent experiment, researchers randomly assigned 350 adults with alcohol use disorders discharged from 2 residential substance abuse treatment programs to either a smartphone-based suite of relapse-prevention interventions or to a control group, and followed them for 12 months [47]. Patients could self-initiate access to the interventions 24/7 and the types of interventions ranged from professionally supported interventions like “ask an expert” that allowed participants to receive personal responses to their questions from addiction experts, to a Panic Button that triggered automated reminders to the participant and alerts to key people they had designated (e.g., counselor, sponsor, family member) who may reach out to the participant via phone or in person. The suite was designed to support recovery by promoting autonomous motivation, coping competence, and relatedness [48]. Relative to the control group, the smart phone based suite of relapse-prevention interventions yielded significantly fewer heavy drinking days and higher likelihood of abstinence from alcohol at the end of the study [49–51].

Despite these encouraging outcomes, the full potential of providing 24/7 access to recovery support via smartphones may not yet have been realized. For example, in the above study, while participants rated themselves on protective and risk factors weekly, opportunities to

intervene “in the moments of need” were lost if the individuals did not self-initiate use of the application; moreover, ratings were subject to recall bias, and “teachable moments” when participants could have cognitively linked the risk factors to their desire or actual use were unexplored. More frequent monitoring of current circumstances (vs. past generalized week) using methods such as Ecological Momentary Assessment (EMA; [52]) may be better suited to this context as they can improve one’s level of self-monitoring, provide additional opportunities to intervene in the moment of risk, minimize recall bias and provide participants with the opportunity to learn more about the relationship between current circumstances and their substance use [52, 53].

Conclusions

Scientific advances in the past 15 years have clearly highlighted the need for recovery management approaches to help individuals sustain their recovery from chronic substance use disorders. This article reviewed some of the recent findings related to common non-system level (federal, state, local) approaches to recovery management: a) continuing care, b) recovery management checkups, c) 12-step or mutual aid, and d) technology-based interventions. As noted earlier, various continuing care interventions have continued to demonstrate value; however, learning more about what works for whom remains critical. Recovery management checkups are effective primarily for linking people back to treatment when needed. In turn, this has indirect effects on substance use (via increased treatment participation) and other outcomes (via treatment and increased abstinence). Because it can take a year or longer for continuing care and checkups to increase treatment enough to improve other outcomes and off-set their costs, it is important to continue to explore ways to study them over longer periods of time. It is also wise to better utilize self-help approaches and information and communication technology (‘health technology’) that may point to more cost-effective alternatives. Health care reform may create expanded opportunities for screening, treatment and recovery support services – but is still very much evolving and should be monitored for benefits and unexpected consequences. We also note the encouraging emerging emphasis on community-based recovery support included in the national drug policy issued annually by the Office of National Drug Control Policy [54]. Finally, there is a critical need to target more recovery research to young adults (aka emerging adults, transitional age youth). The ages between 18 and 25 are a critical period to the onset of both SUD and recovery from SUD, yet this age group is one of the least studied to date. Individuals 18 to 25 represent over half the people in drug courts and the fastest growing segment of people with opioid use disorders. Promising approaches such as campus-based collegiate recovery programs (CRPs; [55]) are increasingly being implemented and have started to capture the attention of researchers [56] but will require prospective studies to reach definitive conclusions about their usefulness. Similarly, smart phone technology has a high potential to reach this critical age group and requires formal evaluation.

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