



Regular articles

Peer-Delivered Recovery Support Services for Addictions in the United States: A Systematic Review



Ellen L. Bassuk, M.D.^{a,b,*}, Justine Hanson, Ph.D.^a, R. Neil Greene, M.A.^a, Molly Richard, B.A.^a, Alexandre Laudet, Ph.D.^c

^a Center for Social Innovation, 200 Reservoir St. Suite 202, Needham, MA, 02494

^b Harvard Medical School, 5 Shattuck Street, Boston, MA, 02115

^c National Development and Research Institutes, 71 W 23rd St #8, New York, NY, 10010

ARTICLE INFO

Article history:

Received 6 August 2015

Received in revised form 18 December 2015

Accepted 5 January 2016

Keywords:

Addiction

Recovery

Peer support

Recovery coaches

Systematic review

ABSTRACT

This systematic review identifies, appraises, and summarizes the evidence on the effectiveness of peer-delivered recovery support services for people in recovery from alcohol and drug addiction. Nine studies met criteria for inclusion in the review. They were assessed for quality and outcomes including substance use and recovery-related factors. Despite significant methodological limitations found in the included studies, the body of evidence suggests salutary effects on participants. Current limitations and recommendations for future research are discussed.

© 2016 Elsevier Inc. All rights reserved.

1. Introduction

Historically drug and alcohol addiction has been addressed through intense professional services during acute episodes. While effective in significantly reducing substance use, relapse rates are generally high (Project MATCH Research Group, 1998; Simpson, Joe, & Broome, 2002; Timko, Moos, Finney, & Lesar, 2000). This is not surprising as science suggests that addiction is a chronic condition for many (McLellan, Lewis, O'Brien, & Kleber, 2000). One of the hallmarks of chronic conditions is that they have no cure. However, remission can be attained and the symptoms arrested. Based on this science-based conceptualization of addiction, the Institute of Medicine and leading addiction researchers have called for a shift in the treatment of substance use disorders from the prevalent acute care model to a continuum of care model akin to that used in other chronic conditions (Humphreys & Tucker, 2002; Institute of Medicine, 2005; McLellan et al., 2000; White, Boyle, Loveland, & Corrington, 2005).

At the same time, the behavioral health field is moving toward recovery-oriented approaches to treatment and care for those with mental and substance use disorders. This approach is based on a holistic definition of recovery as a self-directed process of change through

which individuals improve their health and wellbeing and strive to achieve their full potential (SAMHSA, 2011). Recovery-oriented approaches involve a multi-system, person-centered continuum of care where a comprehensive menu of coordinated services and supports is tailored to individuals' recovery stage, needs and chosen recovery pathway; the goal is to promote abstinence and a better quality of life (Clark, 2007, 2008).

As health care and in particular, addiction services, are adopting a recovery oriented, chronic care approach, there is a growing emphasis on formally incorporating various forms of peer support in the menu of addiction recovery support services. Peer-based recovery support services are defined as the process of giving and receiving nonprofessional, non-clinical assistance to achieve long-term recovery from substance use disorders. This support is provided by peers, also known as recovery coaches, who have lived experience and experiential knowledge (Borkman, 1999) to assist others in initiating and maintaining recovery and in enhancing the quality of personal and family life. Peer-based recovery support services are distinct from mutual aid modalities of peer support in several ways.

The former, peer-based recovery services, are delivered through formal structures and specialized roles (White, 2009) and aim to provide services across a range of domains that support an individual's recovery. These services are delivered in various forms (Laudet & Humphreys, 2013) including one-on-one services delivered by a peer recovery coach, group settings as implemented in recovery housing, and most recently, the growing numbers of collegiate recovery programs (CRPs) offered in academic settings (Laudet, Harris, Kimball, Winters & Moberg,

* Corresponding author at: 200 Reservoir St. Suite 202, Needham, MA, 02494. Tel.: +1 617 467 6014; fax: +1 617 467 6015.

E-mail address: ebassuk@center4si.com (E.L. Bassuk).

2014). Furthermore, peer recovery coaches may work as volunteers or as paid service workers (Kaplan, 2008). They work in a range of settings, including recovery community centers where educational, advocacy, and sober social activities are organized, in churches and other faith-based institutions, recovery homes/sober housing, jails and prisons, probation and parole programs, drug courts, HIV/AIDS and other health and social service centers, and addiction and mental health treatment agencies (Faces & Voices of Recovery, 2010).

In contrast, mutual aid modalities of peer support are typically provided in the context of 12-step groups, such as Alcoholics Anonymous, the most well known form of peer support. Mutual aid is informal, does not require training, and is deeply rooted in bi-directional relationships of mutual support. Typically, mutual aid presents a single pathway for recovery as defined by the mutual aid group model. Although an important form of peer support, this review is focused on peer-based recovery support services and excludes the extensive literature on mutual aid modalities of peer support.

However, the literature synthesizing knowledge on the effectiveness of peer-based recovery support services for substance use recovery is limited. As peer-based recovery support services have been increasingly integrated into formal models of recovery support services, it is critical that we understand their effectiveness. An expert panel described the lack of a systematic knowledge base on peer (and other) recovery supports and concluded that it was imperative to develop a comprehensive evidence base (Faces and Voices of Recovery, 2010). The most recent literature (Reif et al., 2014) examined peer oriented recovery services for people with addictions and concluded that current knowledge supports the usefulness of this approach, but also noted that methodological weaknesses exist that preclude reaching definitive conclusions. This systematic review included U.S. and international studies (Reif et al., 2014). In contrast, our review focuses solely on U.S. studies, and unlike Reif et al.'s review (2014), we exclude cross-sectional correlational studies (studies based on a single time point). The current review both complements and extends the information in Reif et al.'s systematic review by including unpublished grey literature. We also follow a more rigorous design based on established PRISMA standards.

The purpose of this systematic review is to identify, appraise, and summarize the evidence of the effectiveness of peer-delivered recovery support services for individuals in recovery from addictions using strict scientific criteria. We conclude by presenting recommendations for future research.

2. Methods

Three electronic reference databases (PubMed, PsychInfo, and Web of Science) were searched using full-text, keywords, and Medical Subject Headings (MeSH)/Thesaurus headings terms. Search terms included the following: 1) peer involvement; 2) alcohol or drug addiction; 3) known types of peer led recovery interventions; and 4) the outcome of recovery (See Appendix A for full list of search terms). To locate other eligible articles not identified in the electronic database, such as technical reports and research not yet published, we contacted experts in the recovery and addiction fields, combed the websites of organizations known to conduct research in the field, and searched Google and Google Scholar. We also identified other peer-reviewed literature that was not indexed in the reference database search through reference lists of review articles. Our literature search followed the Centre for Reviews and Dissemination (CRD) guidelines (2009).

The systematic review included primary empirical quantitative studies published in English between 1998 and 2014. The start date for the search (1998) aligns with the year the Recovery Community Services Program was launched, marking a milestone for recognizing the importance of the role of peers in delivering recovery support services as an adjunct to treatment (Kaplan, Nugent, Baker, Clark & Veysey, 2010). Articles needed to investigate the effectiveness of peer-support interventions for addictions recovery while meeting study design and population, intervention, comparison, and outcome (PICO) criteria (Sackett, Richardson,

Rosenberg, & Haynes, 1997). Quantitative studies (including mixed-methods) that used a randomized, experimental, quasi-experimental or controlled observational (e.g., cohort analytic, case-control, cohort, interrupted time series) design were eligible for inclusion; cross-sectional studies were excluded. Based on expert opinion on estimating treatment effect (Sim & Lewis, 2012) and preliminary review of the literature, studies conducted among samples of fewer than 50 participants were also excluded. Included studies focused on people in recovery from addiction from alcohol and/or drugs. Studies on tobacco or nicotine addiction were excluded, as were studies that focused on outcomes for peer support workers and volunteers. Any intervention delivered by peers, recovery coaches, or other peer recovery support providers to help people in recovery from addiction was included. Studies that focused on mutual aid models of peer support were excluded, as were studies of peer interventions aimed at facilitating participation in mutual aid groups. Interventions that did not include peer support and did not support recovery from addiction were excluded. Intervention types including telephone-based peer support, recovery programs, recovery centers, peer-run drop in centers, and access to recovery programs were included.

Studies were required to include a comparison group or multiple time points comparing the same group (i.e., single group cross sectional designs were excluded). Single site studies with no control group or comparison data were excluded. Study selection was guided by a holistic definition of recovery as a process of change through which individuals improve their health and well-being, live a self-directed life, and strive to achieve their full potential (SAMHSA, 2011). The primary outcome of interest was substance use. The secondary outcomes of interest were other recovery-related outcomes, such as housing status, health, mental health, criminal justice status, quality of life, and service utilization.

Articles that were primarily commentaries, discussions, editorials, policy analyses, or reviews were excluded, as were newspaper and magazine articles, and book chapters. Dissertations were excluded because of the difficulty of obtaining complete copies. Studies conducted before 1998 were excluded as were studies conducted outside of the United States. Studies that did not specify whether recovery coaches were peers were excluded.

The reporting of this systematic review conforms to recommendations from the Preferred Reporting Items for Systematic Reviews and Meta-Analyses statement (PRISMA) (Moher, Liberati, Tetzlaff, Altman, & The PRISMA Group, 2009) and the CRD Guidance for Undertaking Reviews (Centre for Reviews and Dissemination, 2009). The protocol of this systematic review has been registered with the PROSPERO register at CRD#42014007120.

3. Results

3.1. Literature Search Results

The reference database searches yielded 1,221 studies (see Fig. 1). Additionally, 39 studies not indexed in searched reference databases were identified in the grey literature, which included technical reports and unpublished manuscripts. After removing duplicates, the remaining 1,104 studies were screened for eligibility. One independent reviewer (EB) screened a random sample of 10.4 percent ($N = 110$) abstracts of all identified publications, using a pre-piloted form consisting of the eligibility criteria (described above). A second reviewer (NG) also screened the same sample. Given a 'very good' degree of concordance ($\kappa = 0.83$, 95 percent CI: 0.72, 1.00) between the two reviewers' ratings, each reviewer then completed a review of half of the remaining abstracts (Altman, 1991). A total of 991 articles were excluded. Full texts of the remaining 113 potentially eligible articles (i.e., those passing the abstract/title level of screening) were retrieved and screened by three reviewers ($N = 113$) (EB, MR, NG) independently using the eligibility criteria. Nine were deemed to meet the inclusion criteria and are included in the review. Reasons for exclusion at the full-text level are described in Appendix B.

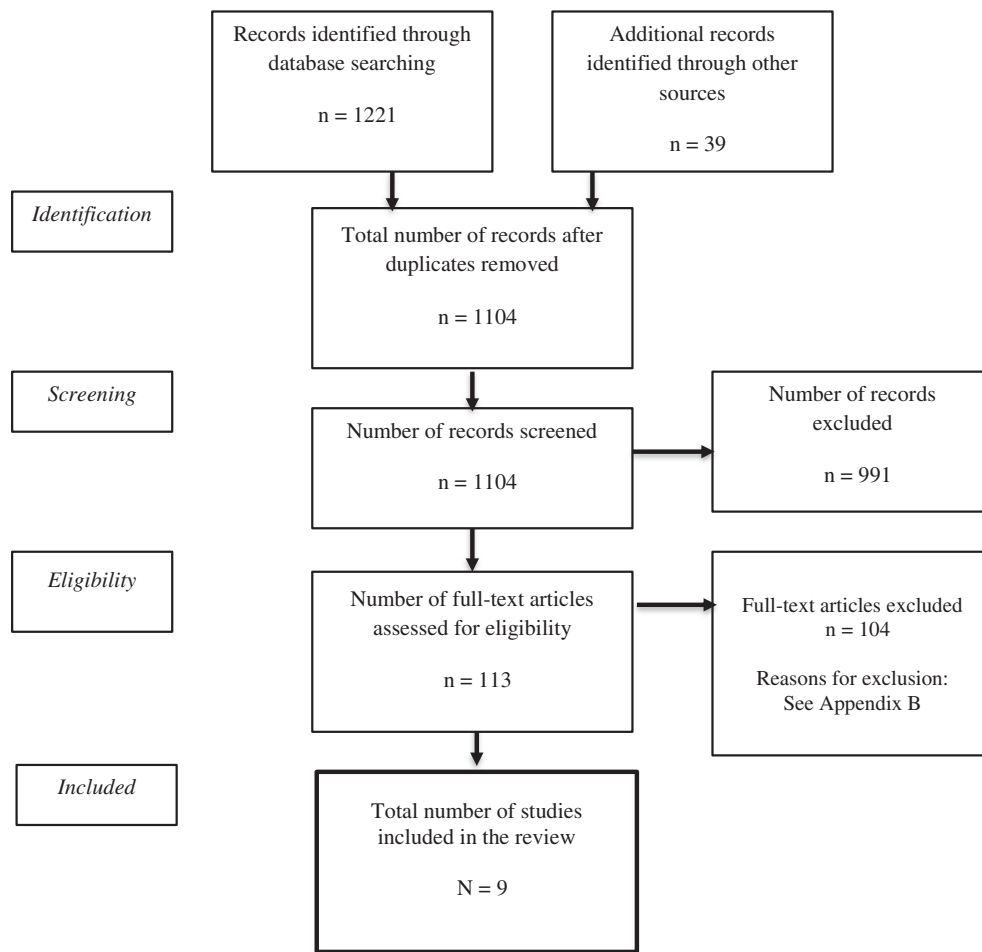


Fig. 1. Flow diagram of study selection.

Three independent reviewers (EB, MR, NG) extracted the following information from the included studies: author, year, study aims, study design (i.e., methods, duration of study, sampling frame, measures), sample size and population characteristics, participant exclusion criteria, nature of the intervention, nature of peer involvement, outcomes examined, recruitment criteria (limitations), and findings. Any disagreements among the data extractors were resolved through discussion.

The same independent reviewers (EB, MR, NG) assessed the methodological quality of included studies using a quality assessment tool developed by The Effective Public Health Practice Project (EPHPP) (1998) (<http://www.ehpp.ca>), which has been widely used for assessing quality in public health studies and has been shown to have adequate reliability, content, and construct validity with observational studies (Armijo-Olivo, Stiles, Hagen, Biondo & Cummings, 2012; Deeks et al., 2003; Thomas, Ciliska, Dobbins, & Micucci, 2004). The tool assesses six domains: selection bias, study design, confounders, blinding, data collection methods, and withdrawals and dropouts. Based on ratings for each domain, a study was categorized as having strong, moderate, or weak methodology. Any disagreements between the reviewers regarding the study quality were resolved through discussion. Statistical pooling of study results was not attempted given substantial heterogeneity across the study design, populations, interventions, and outcomes. Instead, the evidence for each outcome of interest was discussed narratively.

3.2. Study Design & Quality

Of the nine studies focusing on peer-delivered services by an individual peer support worker, four were randomized control trials, three

were quasi-experimental studies, one was a comparison group study, and one was a program evaluation with no comparison group (see Table 1 for more detail). Studies ranged in duration and outcomes were assessed at varying time intervals, ranging from 3 months to 3 years, with most studies following participants for 6 months to a year. Of the nine studies examined, only two (Bernstein et al., 2005; Rowe et al., 2007) were rated as methodologically strong in our quality assessment, due to their study design, data collection methods, and low rates of withdrawals and drop outs. Two studies (Smelson et al., 2013; O'Connell, Flanagan, Delphin, & Davidson, 2014) were of moderate methodological strength, and the remaining five were rated as methodologically weak due to a combination of factors, including selection bias, study design, confounders, blinding, data collection methods, and rates of withdrawals and dropouts. See Appendix C for the quality assessment results.

3.3. Sample Characteristics

Among this group of studies, all focused on adults with alcohol or drug use problems, not specific to a certain substance, with the exception of one study focusing on outpatient users of heroin or cocaine (Bernstein et al., 2005). The sample sizes of the studies ranged from 52 to 4,420 ($M = 765$, $Mdn = 137$). All studies focused on adults and reported the gender of participants, with a majority consisting of males. Two studies focused exclusively on veterans and the participants were 97 percent and 98 percent male, respectively (Tracy, Burton, Nich, & Rounsaville, 2011; Smelson et al., 2013). All studies except one reported the race/ethnicity of study participants and included minority groups that experience health and behavioral health care disparities. Notably,

Table 1
Included Studies on Peer-Delivered Recovery Support Services.

Author, year	Study sample	Study design	Peer component	Measures	Substance use outcomes	Other recovery outcomes	Quality rating
Bernstein et al., 2005	n = 1175 outpatient users of cocaine or heroin (past 30 days) from Boston walk-in clinics. Enrollees were 71% male, 62% Non-Hispanic Black, 23% Hispanic, 46% homeless, mean age 38. 778 participants were involved in analysis.	RCT of a one-time peer-delivered motivational intervention plus written advice and referral list compared to written advice plus referral list. 3 and 6-month follow-ups.	Peers, defined as a substance abuse outreach worker in recovery, delivered a brief motivational intervention during outpatient medical visits. Training was described as systematic and manual-driven. It was implied that the substance abuse outreach workers who were in recovery were paid staff.	Abstinence documented by radioimmuno assay of hair (RIA) hair testing; ASI	At 6 months, the intervention group had more cocaine and heroin abstinence and more drug-free participants. On the ASI drug subscale there was a trend toward greater improvement for the intervention group (49% reduction vs. 46%, p = 0.06). None reported	There were no group differences in contact with the treatment system. Greater improvement in the ASI medical subscale for the intervention group (56% reduction versus 50%, p = 0.055).	Strong
Ja et al., 2009	n = 72 adults facing dual challenge of recovery and reentry in Los Angeles County. Participants were 71% male, 38% Black, 28% White, 31% Latino, mean age 40.	Quasi-experimental study to evaluate the impact of PROSPER (Peers Reaching Out Supporting Peers to Embrace Recovery), a CSAT and RCSP grantee. Assessments at intake, 6 months, and 12 months.	PROSPER, a recovery community governed and operated by peers and focused on clients who were reentering society from the prison system. A Peer Leader Steering Committee guided the development and implementation of services, and those leaders were paid a stipend. Peer recovery coaches were required to have certificates from formal recovery coach academies, participate in ongoing training, and undergo regular supervision. It was unclear if peer recovery coaches were paid or volunteers.	Government Performance and Results Act (GPRA) datasets (SAMHSA)	None reported	Housing stability increased from 21% at baseline to 63% at 12 months; residential treatment decreased from 24% to 7%; and probation/parole status decreased from 82% to 32%.	Weak
Kamon & Turner, 2013	n = 52 Adults seeking help from one of Vermont's Recovery Network Recovery Centers. 62% male, mean age 37.	In a program evaluation with a time series design, participants were assessed at intake and an average of 4 months later.	Peer recovery coaches were required to have certificates from formal recovery coach academies, participate in ongoing training, and undergo regular supervision. It was unclear if peer recovery coaches were paid or volunteers.	Community based recovery capital, measured by the Self Sufficiency Matrix	At baseline, participants reported an average of 118 days abstinent (SD = 217). At follow-up, participants reported an average of 123 days abstinent (SD = 164).	Participants had more primary care visits, fewer hospital/ER/detoxification admissions, and significant increases on domains of recovery capital, (services, housing, health, family, alcohol & other drugs, mental health, legal (p < .05); and social (p < .01)	Weak
Mangrum, 2008	n = 4420 adults in a Texas criminal justice population with sufficient substance abuse to warrant treatment, enrolled in access to recovery (ATR). Clients were 68% male, 21% Black, 34% White, and 44% Hispanic, mean age 31. Clients were compared to non-ATR clients (N = 3008) and non-criminal justice clients (N = 4420) receiving TAU.	Quasi-experimental study evaluating ATR program outcomes. Mean length of stay in treatment was 87 days for ATR clients (78 days for non-ATR criminal justice; 59 days for non-criminal justice).	Services provided through ATR voucher: direct recovery support, and social support. Direct recovery support includes individual recovery coaching, recovery support group, relapse prevention group, and spiritual support group. It was unclear if recovery coaches were paid or volunteers.	Behavioral Health Integrated Provider System (BHIPS) data; self-report abstinence.	ATR clients were significantly more likely to be abstinent 30 days before discharge (85%) compared to non-ATR criminal justice clients (77%; p < .0001) and non-criminal justice clients (67%; p = .0001).	Clients in ATR were more likely to complete treatment (60%) than those in non-ATR treatment 56%; p < .0001), and had better outcomes if drug court or probation was involved.	Weak
Min et al., 2007	n = 484 adults with co-occurring disorders (COD) in Philadelphia. Experimental group Friends Connection (FC) N = 106. FC participants were 69% male, 67.3% Black, 30.1% White, mean age 37, 67% schizophrenia-spectrum, 23.6% affective disorder, and	A 3-year comparison group study of FC and treatment as usual (TAU) outcomes. Participants had been hospitalized within the previous two years. The average duration of enrollment in FC was 2.25 years.	Friends Connection (FC), a peer support program for people with COD. FC peer workers were paid peers who were coping successfully with mental health issues and had abstained from drugs/alcohol for at least 3 years.	Re-hospitalization, using Medicaid claims and the Community Reporting System; Survival analysis determined community tenure (periods of living in the community	None reported.	Significantly fewer people in the FC group were re-hospitalized over a 3-year period than the comparison group (62% vs. 73%, respectively). Survival analysis suggest that FC participants had longer community tenure	Weak

O'Connell et al. (unpublished manuscript)	<p>9.4% mixed diagnosis. Comparison group (TAU) N = 378, with no significant demographic differences. n = 137 Adults with co-occurring psychosis and substance use disorder enrolled post-discharge from the Connecticut Mental Health Center. Of the total sample, 66% were male, 58% were Black, 30% were White, and 13% were Hispanic.</p>	<p>RCT with conditions: 1) TAU plus outpatient service transportation vouchers, 2) TAU plus transportation vouchers plus manual skills training (ST), and 3) skills training plus a peer-led social engagement program (Engage). Compared at 3 and 9 months follow-ups.</p>	<p>A peer worker in condition 3 was defined as a person in recovery trained to provide peer support; peer workers visited participants' home and accompanied them to community mutual aid groups. It was implied that peer workers were paid staff.</p>	<p>without re-hospitalization). The Positive and Negative Syndrome Scale; Social Functioning Scale; Depressive Experiences Questionnaire.</p>	<p>At 3 months, both ST and Engage had significantly greater decrease in alcohol use than TAU (4.79 and 8.15 fewer days drinking in the past 30 days, respectively, compared to TAU). At 9 months, Engage participants had 14.8 fewer days drinking in the past 30 days compared to TAU and significantly greater decrease in number of days out of the last 30 during which they experienced alcohol problems, (b = -14.8, t(8) = -5.59, p < .001). There were significantly lower levels of alcohol use in the experimental group at 6 and 12 months (p < .005). Experimental group decreased alcohol use over time while control group increased alcohol use over time (p < .05). Drug use decreased significantly in both groups to the same extent. From baseline to 12 months, the intervention group's ASI mean score dropped from 0.09 to 0.04 while the control group dropped from 0.05 to 0.04. The MISSION group was less likely to drink to intoxication at 12 months, reducing the odds by 2.9% (OR = 0.29, 95% CI [0.10, 0.83], p = .02).</p>	<p>than TAU (Log-Rank $X^2 = 5.780$, Wilcoxon $X^2 = 7.395$, df = 1). Peer-led support resulted in higher levels of relatedness, self-criticism, and outpatient service use. ST and Engage participants had significantly greater decrease in positive symptoms (ST: b = -0.75, t(209) = -3.29 p < .001; Engage: b = -0.43, t(209) = -1.78, p = .08). ST Participants had a significantly greater decrease in negative symptoms, but no significant decrease in negative symptoms for Engage condition.</p>	<p>Moderate</p>
Rowe et al., 2007	<p>n = 114 persons with co-occurring mental illness, criminal justice histories, and alcohol and drug use disorders. 68% male, 58% Black, and 31% White; 15% endorsed Hispanic ethnicity, mean age 40. 70% had co-occurring disorders.</p>	<p>An RCT comparing an experimental intervention consisting of group and peer support combined with standardized clinical treatment to standardized clinical treatment alone. Outcomes were measured at baseline, 6, and 12 months. Both groups also included jail diversion services.</p>	<p>Six peer mentors, all in treatment for serious mental illness; 3 had co-occurring drug or alcohol disorders; 2 had criminal justice history. Peers met with participants approximately once weekly for 4 months, helping with goal-setting, coping strategies, advocating for services, and encouraging sobriety. It was implied that peer mentors were paid staff.</p>	<p>Alcohol and drug use subscales of the ASI; criminal justice charges, measured using a state court docket management system.</p>	<p>There were significantly lower levels of alcohol use in the experimental group at 6 and 12 months (p < .005). Experimental group decreased alcohol use over time while control group increased alcohol use over time (p < .05). Drug use decreased significantly in both groups to the same extent. From baseline to 12 months, the intervention group's ASI mean score dropped from 0.09 to 0.04 while the control group dropped from 0.05 to 0.04.</p>	<p>Criminal justice charges decreased significantly in both groups to the same extent (Intervention: M = 1.4 at time 1, M = .75 at time 3; control: M = 1.00 at time 1, 0.32 at time 3; p < .05).</p>	<p>Strong</p>
Smelson et al., 2013	<p>n = 333 unemployed homeless veterans with co-occurring SUD and mental health issues; it excluded those with schizophrenia, schizoaffective disorder, bipolar 1 disorder, and serious suicidality. 98.2% male, 61.9% Black, and 26.6% White, mean age 47.</p>	<p>Quasi-experimental study comparing a wraparound intervention with a peer component to treatment as usual with assessment at 12-month follow-up.</p>	<p>Maintaining Independence through Systems Integration, Outreach and Networking (MISSION) peer support component. The description of the MISSION model implies that peer support workers were paid staff.</p>	<p>SCID-IV; ASI; self-reported hospital admission</p>	<p>The MISSION group was less likely to drink to intoxication at 12 months, reducing the odds by 2.9% (OR = 0.29, 95% CI [0.10, 0.83], p = .02).</p>	<p>The MISSION group experienced less serious anxiety and tension (OR = .53, 95% CI [0.29, 0.97], p = .04) at 12 months.</p>	<p>Moderate</p>
Tracy et al., 2011	<p>n = 96 Veterans Administration inpatients with histories of high recidivism. 97% male,</p>	<p>RCT comparing the following 3 groups: 1) TAU with 2) TAU with enhanced dual recovery</p>	<p>Peers staffed MAP-Engage and were required to be abstinent for 6 months prior to employment and</p>	<p>Adherence to post-discharge substance abuse, medical, and mental health</p>	<p>N/A</p>	<p>Compared to TAU alone, the other two conditions were comparable and led to higher rates of</p>	<p>Weak</p>

(continued on next page)

Table 1 (continued)

Author, year	Study sample	Study design	Peer component	Measures	Substance use outcomes	Other recovery outcomes	Quality rating
	57% Black, 25% White, 13% Hispanic, mean age 56. Psychiatric diagnoses included 46% psychotic disorder, 64% mood disorder, and 50% anxiety.	treatment (DRT) and Map-Engage and 3) TAU and Map-Engage	to be referred by their treating physician/clinician. Peer mentors participated for 6 month terms and were paid through the compensated work therapy (CWT) program.	outpatient appointments using attendance records		post-discharge adherence to medical, mental health, and substance use outpatient treatment (group 2: 43%; group 3: 48%; vs. group 1 (TAU): 33% p = .05).	

Abbreviations defined:

Addiction Severity Index (ASI); Alcoholics/Narcotics Anonymous (AA/NA); randomized controlled trial (RCT); Structured Clinical Interview for DSM IV (SCID-IV); substance use disorder (SUD).

the majority of the studies focused on individuals with varying combinations of complex needs and challenges in addition to substance use disorders. For example, five of the studies specifically focused on individuals with co-occurring substance use and mental health disorders (Ja, Gee, Savolainen, Wu, & Forghani, 2009; Min, Whitecraft, Rothbard, & Salzer, 2007; O'Connell et al., 2014; Rowe et al., 2007; Smelson et al., 2013). Several studies included or focused on individuals experiencing homelessness in addition to addiction and other challenges: one study targeted unemployed homeless veterans (Smelson et al., 2013); another study noted that 46 percent of participants experienced homelessness (Bernstein et al., 2005); and three studies focused on individuals transitioning back to the community from psychiatric inpatient treatment or criminal justice settings (Ja et al., 2009; O'Connell et al., 2014; Tracy et al., 2011). See Table 1 for a description of the sample of each study.

3.4. Interventions

The nine studies that examined the effectiveness of recovery support services delivered by a peer describe a range of interventions and services. The setting in which services were delivered varied widely. The programs described in this set of studies were located in diverse settings including peer-run drop in centers (Ja et al., 2009), peer-run recovery community organizations (Kamon & Turner, 2013), and medical outpatient clinics (Bernstein et al., 2005), while others focused on individuals transitioning from residential or psychiatric inpatient care.

Both the interventions and the role of the peers varied widely across the studies. Some did not include detailed descriptions of the intervention or services provided by the peer. The intensity of the peer intervention ranged from a brief one-time motivational intervention delivered by a substance abuse outreach worker in recovery (Bernstein et al., 2005) to a trained peer support worker who made home visits and accompanied individuals to community mutual aid groups (O'Connell et al., 2014). The studies focused on interventions of varying levels of structure and duration, ranging from a 12-month low intensity wrap-around co-occurring disorder intervention delivered by a case manager and peer specialist during the transition from residential care to the community (Smelson et al., 2013) to unspecified recovery support provided by a trained recovery coach in the context of a statewide network of recovery community organizations (Kamon & Turner, 2013). Across the nine studies, interventions varied widely and generally were not comparable (see Table 1 for a description of each study).

3.5. Peer Role and Qualifications

The intervention studies described in this review included peer support workers who had personal experiences of substance use disorder, were in recovery, and served as models or guides for people in the recovery process (see Table 1 for a description of the peer components in each study). Peers were described as "peer specialists," "recovery coaches," "peer mentors," or "a substance abuse outreach worker in recovery." Three studies explicitly reported that peer workers were paid (Ja et al., 2009; Min et al., 2007; Tracy et al., 2011) while four studies implied that peer workers were paid staff (Bernstein et al., 2005; O'Connell et al., 2014; Rowe et al., 2007; Smelson et al., 2013). Paid versus volunteer status was unclear in the remaining two studies. Additionally, several authors specified a required duration of drug/alcohol abstinence to qualify for peer recovery coach credentials. The descriptions of the interventions implied that the peer role was to facilitate and support the client's recovery, but the specific roles and responsibilities of the peers and the types of support were not well defined across the studies. Peers delivered recovery support both individually and as part of a team including other professionals. Although several programs described supervision, the relationship of peers to professional staff was not clearly articulated. Only two of the peer support interventions were conducted in the context of peer-run, peer-operated services:

the Vermont Recovery Center Network (Kamon & Turner, 2013) and Peers Reaching Out Supporting Peers to Embrace Recovery (PROSPER) (Ja et al., 2009).

3.6. Outcomes Measured

The included studies examined a range of outcomes pertinent to the specific interventions studied and the complex needs and challenges of their target populations. In Table 1, we have extracted the relevant outcomes, categorized as “Substance Use Outcomes” and “Other Recovery Outcomes.” The latter category includes a range of outcomes related to the holistic definition of recovery as involving a process related to hope, empowerment, functioning, housing stability, employment and improved health (SAMHSA, 2011). Outcomes examined in this group of studies included: substance use; housing stability; probation/parole status or other criminal justice status; self-sufficiency; health care utilization; emergency service utilization; re-hospitalization rates; severity of symptoms related to mental health conditions; post-discharge adherence to medical, mental health and/or substance use outpatient treatment; recovery capital; utilization of recovery-oriented services; and various outcomes related to functioning (relatedness, self criticism).

Different methods and instruments were used to assess drug and alcohol use. Only one study used a biological measure of abstinence: radioimmuno assay of hair testing (Bernstein et al., 2005). The other studies relied on self-report of substance use, including standard measures such as the Addiction Severity Index (ASI) (McLellan et al., 1992). Three studies (Ja et al., 2009; Min et al., 2007; Tracy et al., 2011) did not report substance use outcomes, only reporting on other indicators of recovery. Other recovery outcomes (e.g., housing, health care, mental health symptoms) reported by the nine studies varied. These variables were measured by standard measures and administrative datasets. See Table 1 for the outcome measures for each study.

3.7. Effectiveness

The included studies examined a wide and disparate range of interventions that offered peer-delivered recovery support in varying quantities and intensity, targeted different groups of high-need individuals, and focused on a range of substance use and other recovery outcomes, making comparisons difficult.

Most studies reported statistically significant findings indicating that participants receiving the peer intervention showed improvements in substance use, a range of recovery outcomes, or both. These findings suggest that peer interventions positively impact the lives of individuals with substance use disorders. One study reported a small trend in reduction of substance use that was not statistically significant at the .05 level (Bernstein et al., 2005; 3 percent difference, .06 p value). This study was a randomized control trial (RCT) that examined a brief motivational intervention delivered by a peer (i.e. a low-intensity peer intervention). While the study design was strong, the intervention was of lower intensity and duration compared to other studies in our review. Our analysis of the odds ratios reported by Bernstein et al. (2005) indicate that, for this study, the effect size (i.e., the “magnitude” of difference between the groups) was relatively small.

The other randomized control trial (RCT) that was rated as strong (Rowe et al., 2007) focused on individuals with criminal justice involvement who also had co-occurring mental illness and alcohol or drug use disorders. They compared an experimental intervention consisting of group and peer support combined with standardized clinical treatment to standardized clinical treatment alone. Controlling for baseline levels of substance use and criminal justice involvement, analysis of standardized self-report questionnaires revealed significantly lower levels of alcohol use in the experimental group at follow-up. Further analysis found that the experimental group decreased alcohol use over time and the control group increased alcohol use over time. Criminal justice involvement (measured using a state court docket management

system) and drug use decreased significantly in both groups to the same extent. Rowe and colleagues (2007) also reported an effect size (i.e., the “magnitude” of difference between the groups) that was relatively small.

Notable findings among the other studies include decreased alcohol use and drinking to intoxication, reduced re-hospitalization rates, and increased post-discharge adherence among the groups receiving the peer intervention. O’Connell et al. (2014) found that the group receiving skills training plus peer-led recovery support had 14.8 fewer days drinking in the past 30 days compared to a standard care group at 9 months. Smelson et al. (2013) found that a peer-delivered treatment reduced odds of drinking to intoxication by 2.9 percent. Min et al. (2007) reported 62 percent of participants from a peer-delivered intervention were re-hospitalized compared to 73 percent in their control group. Tracy et al. (2011) reported post discharge adherence of 43 percent and 48 percent for peer-delivered interventions compared to 33 percent for the treatment as usual group.

4. Discussion and Recommendations

Overall, the majority of studies indicated that participation of peers in recovery support interventions appeared to have a salutary effect on participants and made a positive contribution to substance use outcomes. While we can conclude that there is evidence for the effectiveness of peer-delivered recovery support services, additional research is necessary to determine the effectiveness of different approaches and types of peer support services, with regard to the amount, intensity, skill level of the peer, service context, and effectiveness among different target populations.

When considering the findings, it must be borne in mind that this literature has significant limitations. A few studies lacked a comparison to either the absence of treatment (counterfactual) or a credible alternative (Ja et al., 2009; Kamon & Turner, 2013). Future studies that test similar interventions must include comparison groups, comparing either to usual care and/or alternative approaches. Further, clearly reporting the magnitude of the findings, including both statistical and substantive significance (McCloskey, 1992), will greatly enhance the field’s understanding of the effectiveness of peer-delivered interventions.

Reaching definitive conclusions about study outcomes is hindered by various methodological limitations that restrict the ability to generalize findings. For example, only two of the nine included studies were rated as strong (Bernstein et al., 2005; Rowe et al., 2007). Only four studies used a randomized design (Bernstein et al., 2005; O’Connell et al., 2014; Rowe et al., 2007; Tracy et al., 2011). It is worth noting that none of the included studies set a benchmark for the effectiveness of any particular intervention or program. Therefore, while this small knowledge base on peer-delivered recovery support services is encouraging, research in the area is just emerging, and we lack rigorous studies that permit us to determine the effectiveness of the various approaches with certainty.

Overall, despite the significant methodological limitations of the studies examined, variations in program models, different outcomes of interest, and limited description of peer roles, the general conclusion from the body of evidence is that participation of peers in recovery support interventions appears to have a salutary effect on participants and makes a positive contribution to substance use outcomes. The individuals studied generally had complex needs in addition to substance use issues, and benefitted from the support of peers across diverse types of interventions. However, the empirical investigation of peer-based recovery support services remains in its infancy and there is a strong need to improve specificity in future studies.

In this section, we discuss our findings and recommend strategies for improving the quality of future research that will better enable comparisons and conclusions about how peer recovery supports can facilitate the long-term recovery of individuals with substance use issues. Our findings highlight the need for future studies of peer-delivered recovery

support that employ rigorous methodologies, including randomized clinical trials (RCTs) where possible. Experts examining peer recovery support services note that RCTs may not always be well suited to studying peer-delivered supports given various issues such as the variety of settings where they are implemented (Laudet & Humphreys, 2013). However, researchers should apply the most rigorous methods feasible to maximize the usefulness of their findings to the field. These may include quasi-experimental designs and blinding of outcome assessors to the participant condition, which is possible but rarely reported (Grant et al., 2013). In addition, future studies must adopt a long-term approach that accounts for the recovery process unfolding over many years.

There was significant inconsistency in the definitions of peer workers and recovery coaches among the studies. Most lacked a clear description of their roles and responsibilities in the interventions. Without a clear definition of the nature and role of peer involvement, comparison across studies is difficult and generalizability of findings nearly impossible. Arguably, the inconsistency of the definitions of roles and responsibilities of peer workers is a by-product of the lack of a national credentialing body and the proliferation of a wide range of training and certification programs across the United States. However, the behavioral health field is moving toward greater alignment of training, roles, and responsibilities for peer workers. SAMHSA has undertaken a process to identify and describe core competencies for peer support workers in behavioral health, across mental health and addiction (SAMHSA, 2015). Faces and Voices of Recovery has developed a framework and set of principles and guidelines to accredit Recovery Community Organizations (RCOs), with the stated purpose of “supporting the development of recovery-oriented community-based institutions and programs where peer services are delivered and a commitment to quality assurance and integrity of those services” (Burden, Hill, & Zastowny, 2012, p. 1). In this approach, certification would occur at the organizational level, with guidelines and standards for peer support workers associated with the organization. However, as our systematic review indicates, there is a strong need for future research to carefully describe the nature and role of peer support and the training and credentialing of peer workers. Until the research literature includes stronger and more detailed descriptions of the peer role, it will remain difficult to make comparisons across studies and generalizations about findings.

As a broader definition of recovery gains traction, it is critical that future research expands to mirror the various domains of recovery by including outcomes related to housing status, employment, educational status, quality of life, functioning, trauma exposure, mental health status, and social support networks. As various forms of peer-delivered recovery support services proliferate, more research is needed on matching individuals with the type of support that best fits with their stage of recovery and their personal goals. Factors such as age group, gender, self-identity, motivation to change, health and mental health status, and spirituality should be considered. In addition, peer-delivered recovery support services may be associated with cost savings. While none of the studies we reviewed included data on the cost of services, one study (Kamon & Turner, 2013) reported a decrease in the use of costly services such as emergency rooms and detoxification programs among individuals working with peer recovery coaches. Another important area for future research is exploring the impact of providing peer support on the workers themselves. Only one of the included studies explored this issue. While the sample size was very small ($N = 6$), the peer mentors reported that participation helped them in their own recovery (Tracy et al., 2011).

Finally, future studies must account for the settings in which peer recovery supports are delivered. Much addiction research, including studies bearing on peer-delivered recovery supports, has thus far been conducted among persons enrolled in (or seeking) professional addiction treatment. However, fewer than half of those who need help ever seek or receive treatment for either drugs and/or alcohol problems (Compton, Thomas, Stinson, & Grant, 2007; Hasin, Stinson, Ogburn, & Grant, 2007). As peer supports are becoming increasingly available in

community-based settings, it will be critical to examine the effectiveness of peer-driven approaches for individuals without access to treatment, as well as those participating in treatment.

This systematic review suggests the positive impact of peer-delivered recovery support services. As indicated by our findings, this is a promising area for the development of innovative program models involving peers as well as for future investigation. It is imperative that future studies address the methodological limitations described in this review so that we can develop a robust evidence base supporting peer-delivered recovery services.

Supplementary data (including appendices) to this article can be found online at <http://dx.doi.org/10.1016/j.jsat.2016.01.003>.

Acknowledgments

JMH's effort in this publication was supported by the National Institute on Alcohol Abuse and Alcoholism of the National Institutes of Health under award number K01AA021431. The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health.

References

- Altman, D. (1991). Measuring agreement. In D. Altman (Ed.), *Practical statistics for medical research* (pp. 403–409). London: Chapman and Hall.
- Armijo-Olivo, S., Stiles, C. R., Hagen, N. A., Biondo, P. D., & Cummings, G. G. (2012). Assessment of study quality for systematic reviews: A comparison of the Cochrane Collaboration Risk of Bias Tool and the Effective Public Health Practice Project Quality Assessment Tool: methodological research. *Journal of Evaluation in Clinical Practice*, 18, 12–18.
- Bernstein, E., Bernstein, J., Tassiopoulos, K., Heeren, T., Levenson, S., & Hingson, R. (2005). Brief motivational intervention at a clinic visit reduces cocaine and heroin use. *Drug and Alcohol Dependence*, 77, 49–59.
- Borkman, T. (1999). *Understanding self-help/mutual aid: Experiential learning in the commons*. New Brunswick, NJ: Rutgers University Press.
- Burden, E., Hill, T., & Zastowny, T. (2012). *Developing an accreditation system for organizations and programs providing peer recovery support services*. Washington, DC: Faces and Voices of Recovery (Retrieved from <http://www.facesandvoicesofrecovery.org/resources/developing-accreditation-system-organizations-and-programs-providing-peer-recovery-support>).
- Centre for Reviews and Dissemination (2009). *Systematic reviews: CRD's guidance for undertaking reviews in health care*. York: University of York.
- Clark, H. W. (2007). Recovery as an organizing concept. In W. L. White (Ed.), *Perspectives on systems transformation: How visionary leaders are shifting addiction treatment toward a recovery-oriented system of care* (pp. 7–21). Chicago, IL: Great Lakes Addiction Technology Transfer Center (Retrieved from <http://www.nattc.org/userfiles/file/GreatLakes/2nd%20Monograph-Perspectives%20on%20System%20Transformation.pdf>).
- Clark, H. W. (2008). *Recovery-oriented systems of care: SAMHSA/CSAT's public health approach to substance use problems & disorders*. Philadelphia, PA: IRETA.
- Compton, W. M., Thomas, Y. F., Stinson, F. S., & Grant, B. F. (2007). Prevalence, correlates, disability, and comorbidity to DSM-IV drug abuse and dependence in the United States. *Archives of General Psychiatry*, 64(5), 566–576.
- Deeks, J. J., Dinnes, J., D'Amico, R., Sowden, A. J., Sakaravitch, C., Song, F., ... Altman, D. J. (2003). Evaluating non-randomised intervention studies. *Health Technology Assessment*, 7(27), 1–179.
- Effective Public Health Practice Project (1998). *Quality assessment tool for quantitative studies*. Hamilton, ON: Effective Public Health Practice Project (Retrieved from <http://www.ehp.ca/index.html>).
- Faces and Voices of Recovery (Ed.). (2010). *Addiction recovery peer service roles: Recovery management in health reform*. Washington, DC: Faces and Voices of Recovery.
- Grant, S., Montgomery, P., Hopewell, S., Macdonald, G., Moher, D., & Mayo-Wilson, E. (2013). Developing a reporting guideline for social and psychological intervention trials. *Trials*, 14(1), 242.
- Hasin, D. S., Stinson, F. S., Ogburn, E., & Grant, B. F. (2007). Prevalence, correlates, disability, and comorbidity of DSM-IV alcohol abuse and dependence in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry*, 64(7), 830–842.
- Humphreys, K., & Tucker, J. (2002). Toward more responsive and effective intervention systems for alcohol-related problems. *Addiction*, 97(2), 126–132.
- Institute of Medicine (2005). *Improving the quality of health care for mental and substance use conditions*. Washington, DC: National Academy Press.
- Ja, D. Y., Gee, M., Savolainen, J., Wu, S., & Forghani, S. (2009). *Peers Reaching Out Supporting Peers to Embrace Recovery (PROSPER): A final evaluation report*. San Francisco, CA: DY, Inc. for Walden House, Inc. and the Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration (Retrieved from <http://www.dyja.com/sites/default/files/u24/PROSPER%20Final%20Evaluation%20Report.pdf>).
- Kamon, J., & Turner, W. (2013). *Recovery coaching in recovery centers: What the initial data suggest: A brief report from the Vermont Recovery Network*. Montpelier, Vermont:

- Evidence-Based Solutions (Retrieved from https://vtrecoverynetwork.org/PDF/VRN_RC_eval_report.pdf).
- Kaplan, L. (Ed.). (2008). *The role of recovery support services in recovery-oriented systems of care: DHHS Publication No. (SMA) 08-4315*. Rockville, MD: Center for Substance Abuse Treatment, Substance Abuse and Mental Health Services Administration.
- Kaplan, L., Nugent, C., Baker, M., Clark, H. W., & Veysey, M. (2010). Introduction: The recovery community services program. *Alcoholism Treatment Quarterly*, 28, 244–255.
- Laudet, A., Harris, K., Kimball, T., Winters, K. C., & Moberg, D. P. (2014). Collegiate Recovery Communities Programs: What do we know and what do we need to know? *Journal of Social Work Practice in the Addictions*, 14, 84–100.
- Laudet, A. B., & Humphreys, K. (2013). Promoting recovery in an evolving policy context: What do we know and what do we need to know about recovery support services? *Journal of Substance Abuse Treatment*, 45(1), 126–133.
- Mangrum, L. (2008). *Creating access to recovery through drug courts: Final evaluation report*. Austin, TX: Gulf Coast Addiction Technology Transfer Center (Retrieved from <http://view.officeapps.live.com/op/view.aspx?src=http%3A%2F%2Fwww.utexas.edu%2Fresearch%2Fcswr%2Fnda%2Fdocuments%2FATRFinalEvaluationReport-Final.doc>).
- McCloskey, D. N. (1992). Other things equal: The bankruptcy of statistical significance. *Eastern Economic Journal*, 18(3), 359–361.
- McLellan, A. T., Kushner, H., Metzger, D., Peters, R., Smith, I., Grissom, G., ... Argeriou, M. (1992). The fifth edition of the Addiction Severity Index. *Journal of Substance Abuse Treatment*, 9(3), 199–213.
- McLellan, A. T., Lewis, D. C., O'Brien, C. P., & Kleber, H. D. (2000). Drug dependence, a chronic medical illness: Implications for treatment, insurance, and outcomes evaluation. *JAMA*, 284(13), 1689–1695.
- Min, S. Y., Whitecraft, E., Rothbard, A. B., & Salzer, M. S. (2007). Peer support for persons with co-occurring disorders and community tenure: A survival analysis. *Psychiatric Rehabilitation Journal*, 30(3), 207–213. <http://dx.doi.org/10.2975/30.3.2007.207.213>.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLoS Medicine*, 6(7), e1000097.
- O'Connell, M. J., Flanagan, E., Delphin, M., & Davidson, L. (2014). Enhancing outcomes for persons with co-occurring disorders through skills training and peer recovery supports. Unpublished manuscript.
- Project MATCH Research Group (1998). Matching alcoholism treatments to client heterogeneity: Project MATCH three-year drinking outcomes. *Alcoholism: Clinical and Experimental Research*, 22, 1300–1311.
- Reif, S., Braude, L., Lyman, D. R., Dougherty, R. H., Daniels, A. S., Ghose, S. S., ... Delphin-Rittmon, M. E. (2014). Peer recovery support for individuals with substance use disorders: Assessing the evidence. *Psychiatric Services*, 65(7), 853–861.
- Rowe, M., Bellamy, C., Baranoski, M., Wieland, M., O'Connell, M. J., Benedict, P., ... Sells, D. (2007). A peer-support, group intervention to reduce substance use and criminality among persons with severe mental illness. *Psychiatric Services*, 58(7), 955–961.
- Sackett, D., Richardson, W. S., Rosenberg, W., & Haynes, R. B. (1997). *How to practice and teach evidence based medicine* (2nd ed.). New York: Churchill Livingstone.
- Sim, J., & Lewis, M. (2012). The size of a pilot study for a clinical trial should be calculated in relation to considerations of precision and efficiency. *Journal of Clinical Epidemiology*, 65(3), 301–308.
- Simpson, D. D., Joe, G. W., & Broome, K. M. (2002). A national 5-year follow-up of treatment outcomes for cocaine dependence. *Archives of General Psychiatry*, 59(6), 538–544.
- Smelson, D. A., Kline, A., Kuhn, J., Rodrigues, S., O'Connor, K., Fisher, W., ... Kane, V. (2013). A wraparound treatment engagement intervention for homeless veterans with co-occurring disorders. *Psychological Services*, 10(2), 161–167.
- Substance Abuse and Mental Health Services Administration (SAMHSA) (2011). *SAMHSA's Working Definition of Recovery*. (Retrieved from <http://www.samhsa.gov/recovery/>).
- Substance Abuse and Mental Health Services Administration (SAMHSA) (2015). *Core competencies for peer workers*. (Retrieved from <http://www.samhsa.gov/brss-tacs/core-competencies-peer-workers>).
- Thomas, B. H., Ciliska, D., Dobbins, M., & Micucci, S. (2004). A process for systematically reviewing the literature: Providing the research evidence for public health nursing interventions. *Worldviews on Evidence-Based Nursing*, 1(3), 176–184.
- Timko, C., Moos, R. H., Finney, J. W., & Lesar, M. D. (2000). Long-term outcomes of alcohol use disorders: Comparing untreated individuals with those in alcoholics anonymous and formal treatment. *Journal of Studies on Alcohol and Drugs*, 61(4), 529–540.
- Tracy, K., Burton, M., Nich, C., & Rounsaville, B. (2011). Utilizing peer mentorship to engage high recidivism substance-abusing patients in treatment. *The American Journal of Drug and Alcohol Abuse*, 37(6), 525–531.
- White, W. (Ed.). (2009). *Peer-based addiction recovery support: History, theory, practice and scientific evaluation*. Philadelphia, PA: Great Lakes Addiction Technology Transfer Center, Philadelphia Department of Behavioral Health & Mental Retardation Services.
- White, W., Boyle, M., Loveland, D., & Corrington, P. (2005). *What is behavioral health recovery management? A brief primer*. (Retrieved from www.addictionmanagement.org/recovery%20management.pdf).