

The Protective Wall of Human Community

The New Evidence on the Clinical and Public Health Utility of Twelve-Step Mutual-Help Organizations and Related Treatments



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KEYWORDS

- Alcoholics anonymous • 12-step • Mutual-help • Self-help • Twelve-step facilitation
- Addiction • Recovery

KEY POINTS

- Substance use disorders are often chronic conditions conferring a prodigious burden of disease, disability, and premature mortality in most middle- and high-income countries.
- Ubiquitous mutual-help organizations (MHOs), such as AA, despite being community-based and peer-led, are a de facto part of most societies' response to addressing the endemic problems caused by substance use disorders and are the most commonly sought source of help for alcohol and other drug (AOD) problems.
- Until recently little was known from a rigorous scientific standpoint about the clinical and public health utility of these organizations or about the efficacy of the clinical interventions (twelve-step facilitation [TSF]) designed to facilitate their use during and following treatment.
- Following a call for more research from the Institute of Medicine of the National Academy of Sciences in 1990, a flurry of rigorous randomized controlled trials (RCT), cost-effectiveness analyses, and studies of the mechanisms through which the largest recovery MHOs, AA, confers benefit, has revealed that AA and TSF interventions are valuable empirically supported, highly cost-effective, interventions that confer benefit through dynamically mobilizing a variety of therapeutic mechanisms.
- AA and similar freely available community-based 12-step and non-12-step (eg, SMART Recovery) MHOs may be the closest thing public health has to a "free lunch."

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Psychiatr Clin N Am 45 (2022) 557–575

<https://doi.org/10.1016/j.psc.2022.05.007>

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INTRODUCTION

For those with severe forms of alcohol and other drug (AOD) use disorders the duration of the clinical course of illness tends to be a lengthy one before initial (one year), and stable (five or more years), remission is achieved. **Boxes 1** and **2** As shown in **Fig. 1** for instance, studies show that it can take up to 8 years and around 4 to 5 treatment/mutual-help participation episodes before adults treated for alcohol or other drug use disorders achieve initially sustained remission.^{1–4} Furthermore, as shown on the right of this figure, it can take another roughly 5 years of continuing remission before the risk of meeting criteria for alcohol/drug use disorder in the ensuing year drops less than 15%—the annual rate in the general population of meeting criteria for an alcohol or other drug use disorder.^{5–8}

Most countries respond to these endemic and often enduring problems by providing a system of professionally directed and delivered care and through a more unplanned reliance on freely available community-based services such as recovery-focused mutual-help organizations (MHOs). There are dozens of these organizations of varying size, scope, availability, accessibility, emphasis, philosophy, and practices.^{9–11} The oldest and by far the most ubiquitous and influential of these is alcoholics anonymous (AA).

Beginning in 1930s Akron Ohio, in the United States, AA has expanded from 2 to roughly 2 million, members at any given time and has spread to more than 150 countries around the world. Its rapid growth and 12-step program and literature inspired the founding of myriad other 12-step organizations addressing other drug use disorders

Box 1

Clarifying 12-step terminology and concepts

- There is often confusion regarding the evidence on “AA” vs “12-step treatment.” Also, within 12-step “treatments,” there can be additional confusion. Most of the scientifically rigorous research evidence to date comes from outpatient rather than inpatient delivered models of care. The outpatient models which have provided most of the RCT evidence for AA have provided the most rigorous tests of so-called, “Twelve-Step Facilitation” (TSF) interventions which have been developed and tested in various formats (**Fig. 2**) including as a fully independent multi-session 12-step focused treatments (eg, Project MATCH TSF;²²; see **Fig. 2A**); as a combined and integrated treatment (TSF infused with CBT elements; eg,²³; see **Fig. 2B**); as part of an intensive outpatient program whereby one of the groups is dedicated to TSF (eg, Making AA Easier [MAAEZ];²⁴; see **Fig. 2C**); or as a specific TSF modular add-on that is added on to the end of usual treatment—typically taking the form of a clinically facilitated “warm handoff” linkage to existing members (eg,^{25–27}; see **Fig. 2D**).
- In contrast, “12-step treatment” as it is usually described, is delivered in residential facilities whereby it is harder to conduct RCTs (very high-quality quasi-experimental studies have been conducted; see,^{28,29} but includes intensive immersion in 12-step philosophy and practices in preparation for linkage with community-based AA following discharge to help prevent relapse. Obviously, in both instances, these differing formal levels of care delivery are not direct tests of AA, per se. Rather, they are tests of clinical preparation, initial exposure (eg, through onsite 12-step meetings), and active linkage to these community-based organizations. To test the ability of AA itself to confer these benefits, additional tests of mediation are conducted under the auspices of these RCTs of TSF to uncover why it is that TSF treatments tend to produce better outcomes than comparison conditions such as cognitive-behavioral therapies (CBTs) (see,³⁰ and later in discussion). Such studies have shown that the reason why TSF confers this additional benefit in terms of sustaining remission is due to the fact that it engages more patients with AA and thereby, enhances outcomes.^{23,31,32}

Box 2**Summary of the efficacy and effectiveness research on treatment step facilitation treatments**

- Confusion regarding the clinical and public health utility of AA, other 12-Step mutual-help organizations (MHOs), and related 12-Step treatments, has persisted until relatively recently.
- Findings now reveal that, when AA and TSF interventions for alcohol use disorder are subjected to exactly the same scientific standards as other clinical interventions, AA/TSF performs at least as well on most outcomes, but better regarding helping patients achieve continuous abstinence and remission over time, and at a substantially reduced health care cost.
- For other drug use disorders, less high-quality research is available. Yet, this body of research shows a similar and highly promising pattern of results supporting the utility of groups such as cocaine anonymous, crystal methamphetamine anonymous, and narcotics anonymous for patients suffering from a variety of drug use disorders.
- Given the long-clinical course to initial and stable remission for addiction patients (see Fig. 1), these community-based recovery support resources have strong clinical and public utility that seem well matched the undulating course of addiction recovery.

as well as help for distraught family members who are trying to cope with the grave and enduring unpredictability of addiction (eg, Al Anon).

While growth, size, and longevity, offer one type of observational evidence for potential benefit—at least for some—it has not been until recently that the scientific picture regarding the verifiable clinical and public health utility of AA and 12-step clinical treatments that are designed to introduce and systematically encourage and provide linkage to AA (so-called, “Twelve-Step Facilitation” [TSF] treatments) has been clarified from a rigorous empirical standpoint.

This chapter reviews the background, significance, and scientific evidence on AA and TSF treatments in the treatment of AOD use disorders. In addition, the cost-effectiveness and mechanisms of behavior change through which AA has been shown to confer recovery benefits are reviewed revealing some intriguing findings that may bode well for the clinical and public utility of other types of recovery-focused mutual organizations.

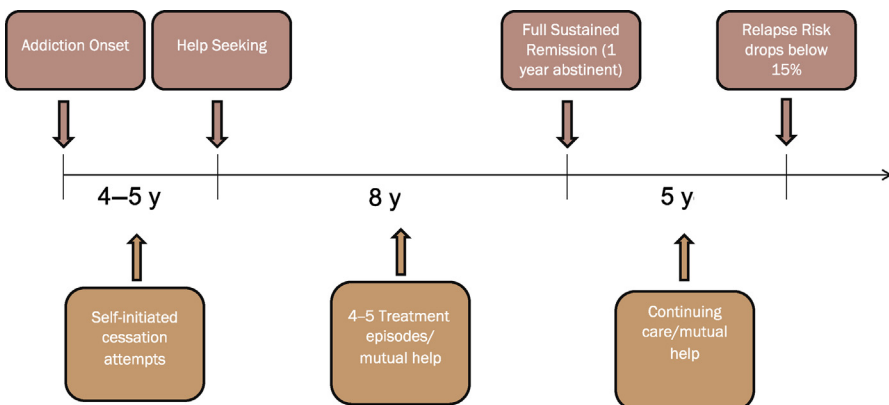


Fig. 1. Timeline of the clinical course of alcohol and other drug addiction remission and recovery for adult clinical cases.

Background and Significance

AA is a highly ubiquitous, indigenous, community recovery support resource. By design, the noncentralized and fully self-governing and financially self-supporting structure of AA outlined in its group guidance manual “Twelve Traditions,”¹² gave free authorization to anyone who wanted to start an AA group to do so, provided they generally kept to these AA traditions.¹³ This meant, of course, that AA was less able to have much “quality control” over the week-to-week operation of AA groups, with the tradeoff being uninhibited dissemination which facilitated widespread adoption wherever people felt they needed it. This expansion was accelerated also by what might be considered an evangelical AA spirit of “carrying the message” of recovery to others in need that was embodied in AA’s 12th step (“Having had a spiritual awakening as the result of these steps, we tried to carry the message to other alcoholics and to practice the principles in all of our affairs”)¹⁴. This aspect of 12-step practice that potentially emanated from its Christian origins in the Oxford Group movement^{15,16} was later supported therapeutically from a clinical standpoint in the construction of the “helper principle”—that helping others helps yourself¹⁷ and in AA research itself.¹⁸ The fact that AA adopted a law of “corporate poverty,” never to own any property, declining any outside financial contributions to its operations, and even declining donations from its own members above a small annual amount (currently no more than \$5000 per year;¹⁹) was, and remains, so highly unusual of any organization—even religious ones—that it gained favorable press and media coverage that helped the public gain awareness of AA and its methods.²⁰

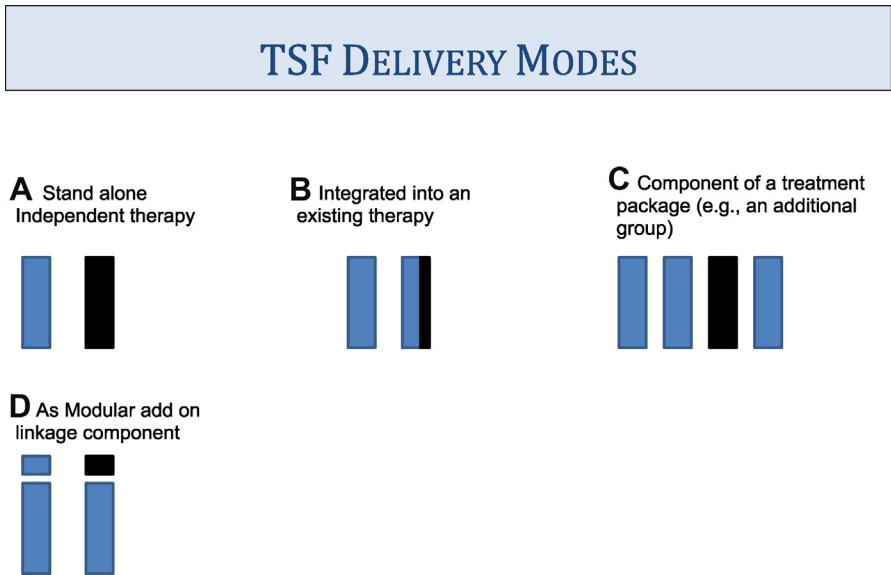


Fig. 2. Methods of delivery of twelve-step facilitation (TSF) techniques as compared with other types of treatments (TSF in black).

AA’s accessibility and presumed positive impact were acknowledged and awarded over the years since its beginning. In 1956, AA was awarded the Lasker Award from the America Public Health Association (America’s own version of the Nobel prize);

renowned Secretary of State, Henry Kissinger, described AA as “America’s gift to the world”; and AA’s main text was published in 1939 (“the Big Book”¹⁴; has a place among just 88 books in the US Library of Congress in the category of “books that have shaped America”).

AA was winning and has won many accolades, but popularity and even public recognition and awards are not always commensurate with scientifically verifiable clinical and public health impacts. Nonetheless, AA and its philosophy made their way into nearly every addiction treatment program in the US and by the 1980s was the predominant model of US care for addiction.¹⁶ The next section reviews the growing quantity and quality of evidence that has emerged during the past 70 years regarding AA.

Current Evidence

As reviewed in detail later in discussion, whereas the scientific picture of the true effectiveness of AA and related 12-step treatments has now been clarified, it was not until 1990 that an influential report from the US Institute of Medicine²¹ of the National Academy of Sciences was published that highlighted the need for greater study in the of MHOs. “Broadening the Base of Treatment for Alcohol Problems”²¹ explicitly requested more 12-step research be conducted and specifically on the mechanisms through which AA conferred benefit. For the first time, this legitimized serious scientific investigation into AA and 12-step treatment that brought with it funding support from the US National Institutes of Health (NIH), the Department of Veterans Affairs, and numerous private foundations. In the 30 years since, there has been a flurry of federally funded clinical trials, studies of health care cost offsets and cost-benefits analyses, and dozens of investigations of its mechanisms of behavior change, which has finally and convincingly revealed AA’s clinical and public health utility, cost-benefits, and clarity on how it helps people into remission.

This section reviews the most rigorous scientific evidence on AA participation, 12-step clinical treatments designed to link patients with AA, and cost-effectiveness studies. It also reviews the mechanisms of behavior change research that has begun to uncover the therapeutic factors that are dynamically mobilized by AA participation over time.

Systematic Reviews and Meta-Analyses of the Evidence on Alcoholics Anonymous and 12-Step Treatments

The first systematic quantitative review of scientific research on AA was published in 1993.³³ At that time, it included studies conducted during the 1960s, 70s, and 80s, concluding that AA conferred a moderate beneficial effect on alcohol use outcomes. Yet, it also noted that the quality of the research up until the time of the review was generally methodologically poor, comprised of nearly all correlational, nonexperimental, investigations; low follow-up rates; and use of poorly validated measures with low content validity.^{33,34} It also noted that the AA variable associated most strongly with future alcohol use reductions and abstinence was having an AA mentor known in AA terminology as an AA “sponsor” (ie, having a more experienced member with more sobriety duration who provides ongoing recovery coaching, advice, support, accountability, and role-modeling). As noted previously, as the initial request from the IOM,²¹ dozens of clinical trials have been conducted to test the clinical utility and benefits and cost-benefits of introducing patients with alcohol use disorder to the 12-step philosophy and practices of AA and proactively linking patients with this free community-based resource.

By far the most rigorous review of the best evidence was summarized and published in the Cochrane Library in 2020.³⁰ The Cochrane library of systematic reviews is

regarded worldwide as the gold standard in scientific rigor and is the organization that national governments and health agencies look to for informing and helping to guide decisions of health care protocol delivery for addressing a variety of high volume and high burden disorders including AOD use disorders.

The Cochrane review³⁰ included 27 studies published across 35 peer-reviewed papers and included almost 11,000 patients with mostly severe alcohol use disorder. In terms of included study designs, they had to be either randomized controlled trials (RCTs), or high-quality comparative effectiveness studies that followed patients prospectively over time. Any reported outcome was permissible with most of the studies reporting various types of abstinence-related outcomes (eg, proportion of patients who were completely abstinent at various follow-ups; the longest average period of abstinence; the percentage of days on which patients in the different treatment conditions were abstinent); the average intensity of alcohol use on days on which patients consumed alcohol (drinks per drinking day); or average heavy drinking days (usually 5 or more drinks); as well as combined indices of addiction severity measured typically via the Addiction Severity Index.³⁵ Despite all outcomes of any type being permissible for inclusion in the review, there were no measures included on quality of life or functioning in the published reports.

Economic analyses that examined the cost-effectiveness of different treatments were also included and examined for health care offset potential given that linking patients to freely available AA community resources was anticipated not only to help patients maintain remission but also to reduce the use of more expensive professional counseling and health care services (eg, emergency departments; overnight hospital stays).

The Cochrane review was coded also for studies that used manualized treatment approaches because having, and adhering to, a manual in treatment studies ensures that the presumed active ingredients of the therapy are actually delivered in an explicitly articulated way and are presumed to be a more scientifically rigorous test of the treatment. Also, manualized interventions can be replicated by others in different contexts to ensure that the effects of the therapy itself (ie, TSF) are not due to other factors.

Quite strikingly, compared with other active and theoretically well-grounded interventions to which TSF was compared, such as manualized and well-articulated cognitive-behavioral therapies (CBTs) and motivational enhancement therapies (METs), the TSF intervention linkage conditions to which patients had been randomly assigned were found to do as well as active comparison treatments on every single outcome measured except 2 whereby TSF outperformed such active comparison treatments: randomization to TSF resulted in substantially higher rates of continuous abstinence and remission from alcohol use disorder for up to 3 years following treatment; and TSF produced much greater health care cost savings of approximately \$10,000 per patient over a 2 year period. When extrapolated to the US population of alcohol addiction patients treated annually in the United States, this resulted in a health care cost reduction in the region of \$15 billion per year (in 2019 dollars) if all similar patients in the US were linked to AA.³⁰

The magnitude of these differences in clinical outcomes and health cost savings is even more striking when one considers that many patients in the active comparison treatments who received CBT, MI/MET, or other interventions, also elected to attend AA in the posttreatment follow-up period making these effect size estimates more conservative with regard to the true effect of AA/TSF.

Additional research using sophisticated instrumental variable analyses that used randomization as the instrumental variable to rule out self-selection bias (Boef, Cessie, Dekkers, 2013), also provides additional strong scientific support for the benefit of TSF to AA linkages in improving patients' outcomes.³⁶

Evidence on 12-Step Treatments and Community 12-Step Participation for Other Drug Use Disorders

Given the size and influence of alcohol use disorder in the substance use disorder (SUD) epidemiologic landscape, accounting for 75% of addiction cases nationally,³⁷ and thus the corresponding size and influence of AA, the vast majority of research on MHOs and related professional TSF linkage treatments have been conducted on patients with alcohol use disorder. A sizable scientific literature exists also, however, on RCTs and naturalistic observational studies for other drug use disorders.

Most of the more rigorous RCT studies of drug use disorders included patients who were addicted to cocaine (eg,³⁸) or methamphetamine (eg,³⁹). Naturalistic follow-up studies have included patients with a variety of drug use disorders (eg, opioids, cocaine, amphetamine/methamphetamine, cannabis) many of whom also had either a primary or secondary cooccurring alcohol use disorder.⁴⁰ A number of the more rigorous trials were summarized in another rigorous systematic review published by the Campbell Collaboration.⁴¹ This systematic review found that TSF interventions performed as well on every outcome measured and found some advantage of TSF at shorter-term follow-ups. The evidence base for this review was much smaller, however, compared with that of patients with AA and alcohol use disorder, consisting of only 10 studies and only about 1000 total patients.

The quality of these drug use disorder-focused studies in the Bog and colleagues⁴¹ review was judged to be generally of low quality. Consequently, more high-quality research is needed on TSF interventions and use of mutual-help groups (eg, NA, CA, Crystal Methamphetamine Anonymous [CMA], Marijuana Anonymous [MA]) for drug use disorders. That said, the Bog and colleagues⁴¹ review did not include some landmark RCTs, such as the Cocaine Collaborative Study comparing three different psychosocial treatments for cocaine use disorder, one of which was a 12-step oriented counseling ("Individual Drug Counseling" [IDC] which was compared with a psychodynamically oriented "Supportive Expressive Therapy," as well as to a "Cognitive Therapy" specifically catering to drug use disorders;³⁸) and the STAGE-12 study³⁹ for treating methamphetamine use disorder. It is possible that the cocaine collaborative investigation was not included because it may have not seemed in searches of "12-Step" because it did not explicitly mention that terminology in the titles or abstracts of the published studies. It is possible also that the STAGE-12 study was not included because it compared the experimental manualized intervention (STAGE-12) to "treatment-as-usual [TAU]" that also included 12-step elements. That said, the Cochrane Review on AA/TSF did include such studies and found a bigger benefit for the more well-articulated manualized AA/TSF interventions compared with TAU which often included elements of TSF. Both the Cocaine Collaborative study and the STAGE-12 RCTs found significant advantages for the manualized TSF treatments for cocaine³⁸ and methamphetamine use disorder,³⁹ respectively.

Regarding opioid use disorder, specifically, there have been numerous studies published on the effects of Narcotics Anonymous (NA), but none of these studies are of high quality from a rigorous scientific standpoint that allows for clear causal attributions to be made.^{42,43} Emerging evidence from statistically controlled prospective observational studies do show positive salubrious relationships between NA participation and better opioid use disorder outcomes, particularly increased abstinence and enhanced adherence to medications for the treatment of opioid use disorder.^{44,45}

NA attendance has been shown associated with better opioid outcomes among those with opioid use disorder in buprenorphine treatment,⁴⁴ in buprenorphine or extended-release naltrexone treatment, or over the long-term independent of

buprenorphine or methadone engagement.⁴⁵ In a long-term follow-up of participants in the Prescription Opioid Addiction Treatment Study, NA mutual-help attendance was associated with twice the rate of abstinence independent of buprenorphine or methadone engagement more than 3 years after entering the trial.⁴⁵ Professionally delivered behavioral treatment in that study, on the other hand, was not associated with opioid abstinence.

During a 24-week RCT comparing buprenorphine to extended-release naltrexone,⁴⁶ whereby all participants were offered individual and group therapy, and could attend 12-Step MHOs in the community, both self-selected 12-Step MHO attendance and individual therapy, but not group therapy, were associated with significantly greater opioid abstinence at the end of the trial controlling for treatment arm, baseline heroin use, and other clinical and demographic characteristics.⁴⁷ Each additional 1 hour (ie, 1 NA meeting) was uniquely associated with 5% increased odds of abstinence. Interestingly, individual therapy and NA attendance had multiplicative benefits on opioid abstinence, suggesting that the combination may offer unique recovery benefits.

Also, in a 6-month randomized trial comparing standard to intensive outpatient treatment, in which all participants received buprenorphine, self-selected attendance at NA meetings was associated with both treatment retention and abstinence during the 6-month study.⁴⁴ Controlling for demographic characteristics, treatment site, group therapy attendance, and counselor requirements to attend NA, each additional NA meeting attended was uniquely associated with 2% increased odds of treatment retention and 1% increased odds of abstinence.

These positive effects are perhaps somewhat surprising given NA's official, more negative, stance on agonist medication use in the treatment of opioid use disorder (buprenorphine, methadone), in particular, as such individuals are sometimes viewed as still being under the influence of opioids and therefore not yet in "real" recovery.⁴⁸ The Monico and colleagues⁴⁴ provide some helpful insights from extensive qualitative work as to how patients on medications for opioid use disorder are able to nevertheless use NA and benefit from participation. On the whole, however, much more research is needed on NA given its size, influence, accessibility, as well as its potential to assist many with opioid and other drug use disorders to achieve and sustain remission over the longer term.

How Do 12-Step Mutual-Help Organizations Confer Benefit: Research on the Mechanisms of Behavior Change?

As noted above, since the request for more rigorous research on the clinical and public health utility of AA and related professional treatments and greater understanding of its mechanisms, dozens of rigorous clinical trials have been conducted along with dozens of sophisticated mechanisms of behavior change studies. Largely funded by the National Institutes of Health (NIH) and the Department of Veterans Affairs, these studies have uncovered some of the many mechanisms through which AA confers benefit over time. Although the following review of such mechanism's research pertains specifically to AA participation, it is likely that many of these same mechanisms are mobilized by participation in other 12-Step, as well as non-12-Step, MHOs (eg, SMART Recovery, LifeRing, and so forth) as many of the same broad-based therapeutic dynamics are likely common to all types of groups.⁴⁹

Of note, 12-Step organizations' own theory about how recovery is purportedly achieved is through what it terms a "spiritual awakening." Although this was conceived initially to take the form of a sudden quantum shift in outlook and functioning (a new "God consciousness,"⁵⁰ that facilitated the ability to recover from deadly alcohol addiction, this notion was later expanded to include many member's recovery

experiences that were characterized by more of a gradual change in outlook and functioning of the “educational variety”⁵⁰). While much remains to be investigated regarding the examination of AA’s mechanisms, most of the existing body of research has revealed that AA confers relapse prevention and recovery benefit mostly by successfully mobilizing changes across multiple domains simultaneously; notably helping participants exclude heavy drinking/drug using individuals from their social networks and adopting abstaining and recovering individuals into their social networks.^{51–53} It also been shown to enhance recovery motivation and abstinence self-efficacy^{54–58} as well boost cognitive-behavioral relapse prevention skills,^{55,58} reduce impulsivity,⁵⁹ and reduce craving.⁶⁰ Empirical tests of some of its other central purported mechanisms such as spirituality^{61,62}; J. S.⁶³ have demonstrated that enhancing spiritual practices is one of the mechanisms through which AA also confers relapse prevention benefit. Other tests of AA’s central theoretic mechanisms through which the organization itself purports to prevent relapse (ie, through decreasing anger/resentment; and reducing self-centeredness),^{14,50} have also been tested but have not been supported as mechanisms of behavior change (eg, anger;⁶⁴; self-centeredness.⁶³) Reductions in symptoms of negative affect (depression symptoms) as a potential mechanism through which AA prevents relapse have also been rigorously tested showing that AA does reduce negative affect, but this reduction by itself may not relate to reductions in relapse risk in rigorously controlled analyses.⁵²

Given that each of these studies almost without exception tested only a single mediating variable (eg, abstinence self-efficacy alone or social networks alone), finding support for each one’s ability to explain at least some of AA’s beneficial recovery effects, a question has remained as to what are the most salient and important mechanisms through which AA confers a benefit.

The answer to this question was elucidated in several published studies testing multiple mechanisms simultaneously.^{52,65,66} In these tests of “multiple mediation,” we incorporated six different mediators simultaneously that had been shown previously in individual mediator analyses to explain, at least in part, AA’s beneficial effects on increasing abstinence and reducing relapse risk (see schematic in [Fig. 3](#)). Of note, we also examined variables that may have influenced the degree to which these multiple mechanisms helped AA participants reduce relapse risk (ie, we conducted tests of moderated multiple mediations). These sets of analyses, thus, examined questions such as: 1. What are the most important mechanisms through which AA confers benefit? 2. Do the various ways in which patients benefit from AA differ by addiction severity⁶⁶; [Fig. 4A](#)) by gender⁵²; ([Fig. 4B](#)) or by age⁶⁵; [Fig. 4C](#)).

Intriguingly, the mechanisms through which AA is shown to reduce relapse risk differ in nature and magnitude and also across different characteristics (ie, addiction severity; gender; age). As highlighted in [Fig. 4A](#), for more severely addicted “aftercare” patients, AA was shown to increase abstinence (percent days abstinent [PDA]) and reduce the intensity of alcohol use (drinks per drinking day [DDD]) mostly by the mobilization of adaptive changes in patients’ social networks, but also by boosting spirituality which in turn reduced relapse risk. Of note, spirituality was not found to be a mediator for the less severely addicted “outpatient” patients. Instead, the vast majority of the effect of the way that AA participation helped the less severely addicted patients recover, was through facilitating adaptive changes in their social networks and by boosting confidence in their ability to cope with high-risk social situations without drinking (ie, by enhancing abstinence social self-efficacy).

When testing whether men and women differ in the ways that AA aids their addiction recovery (see [Fig. 3](#)), analyses demonstrated that men and women both derived equal overall relapse prevention benefits from participation in AA, but the ways in which they

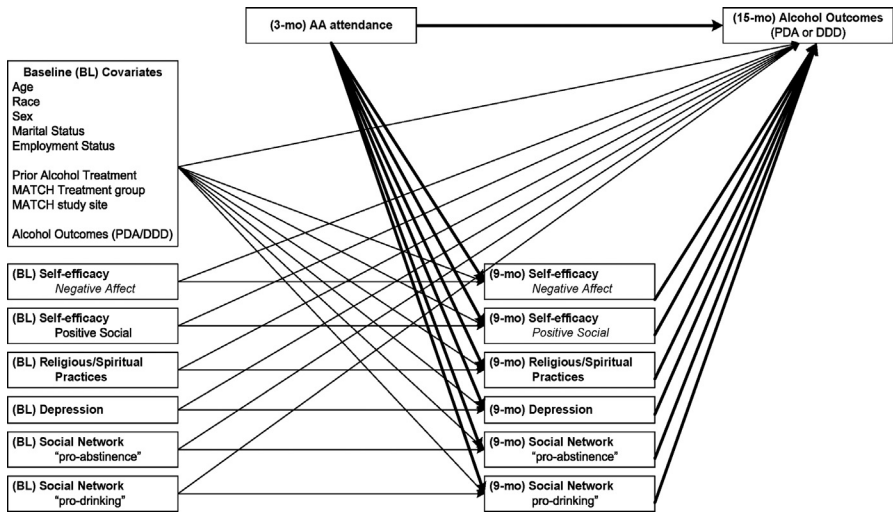


Fig. 3. Schematic of the mechanisms of behavior change studies testing the relative importance of six mediators of relapse prevention effects from AA participation. Note: "Pro-drinking" is measured to assess AA's ability to *reduce* pro-drinking social network members. DDD, drinks per drinking day; PDA, percent days abstinent. (Figure reproduced from Kelly, Hoepfner, Stout, Pagano (2012), Determining the relative importance of the mechanisms of behavior change within Alcoholics Anonymous: A multiple mediator analysis. *Addiction* 107(2):289-99.)

benefitted differed significantly and dramatically.⁵² Among women, for example, by far the most significant way that AA helped them to prevent relapse was by boosting their confidence in their ability to cope with negative affect without drinking (ie, by enhancing their negative affect-specific abstinence self-efficacy) and by reducing depression symptoms. Interestingly, men showed a strikingly different picture. Among men, by far the most salient way that AA helped them prevent relapse was by boosting their confidence in their ability to cope with high-risk social situations whereby alcohol was present without drinking and by helping men shift their social networks toward recovery-oriented ones.

The magnitude of these differences was stark and highlights the different types of biobehavioral and social context relapse risk factors facing men and women with alcohol addiction during the mid-stage of the life course: for men, the biggest risk for relapse seems to involve direct and indirect alcohol cue exposure in social contexts; for women, it is the experience of negative affect.⁵²

A further analysis compared young adults (18–29 years old) to older adults (30+ years old) again to investigate whether the mechanisms through which AA helped prevent youth relapse were different from those aiding older addicted patients (⁶⁷; see Fig. 3).

Noteworthy in these moderated multiple mediation analyses, was that young adults derived the same degree of relapse prevention benefit as older adults but once again the ways that this occurred differed in nature and magnitude across the 2 cohorts.

First, the set of 6 mediators (see Fig. 3) was only able to account for about 25% of the direct effect of AA in preventing relapse—this was half of that explained by these same 6 mediators for older adults. Second, the most striking way that AA helped young adults recover was by helping them exclude heavy drinking/drug using

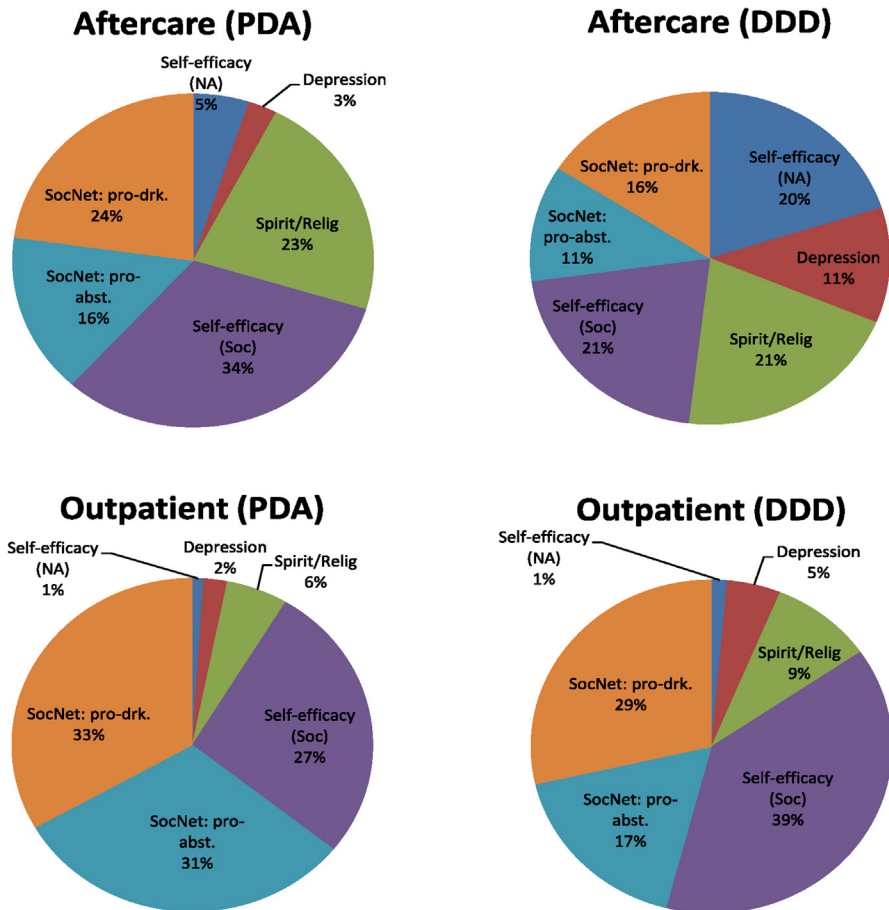


Fig. 4. (A) Figure reproduced from Kelly, Hoepfner, Stout, Pagano (2012), Determining the relative importance of the mechanisms of behavior change within Alcoholics Anonymous: A multiple mediator analysis. *Addiction* 107(2):289-99. (B) Figure reproduced from Kelly and Hoepfner (2013), Does Alcoholics Anonymous work differently for men and women? A moderated multiple-mediation analysis in a large clinical sample. *Drug and Alcohol Dependence*, 130(1-3), 186-193. (C). Figure based on data from Hoepfner, Hoepfner, Kelly (2014), Do young people benefit from AA as much, and in the same ways, as adult aged 30+? A moderated multiple mediation analysis. *Drug and Alcohol Dependence*. 143, 181-188. DDD, average drinks per drinking day; PDA, average percentage of days on which participants were abstinence from alcohol.

individuals from their social networks. The magnitude of this mediated effect was about twice that of their older adult counterparts (see Fig. 4A “pro-drink” segment). Interestingly, unlike the older adults, who benefitted from AA also by it helping them adopt abstainers and recovering individuals into their social networks, AA was not found to work through this mechanism for young adults. The exact reason for this big difference remains unclear, but one plausible explanation is the relative dearth of young adults in AA compared with older adults,^{68,69} making it simply more challenging for young adults to find new significant social network members in AA with whom such members can associate.

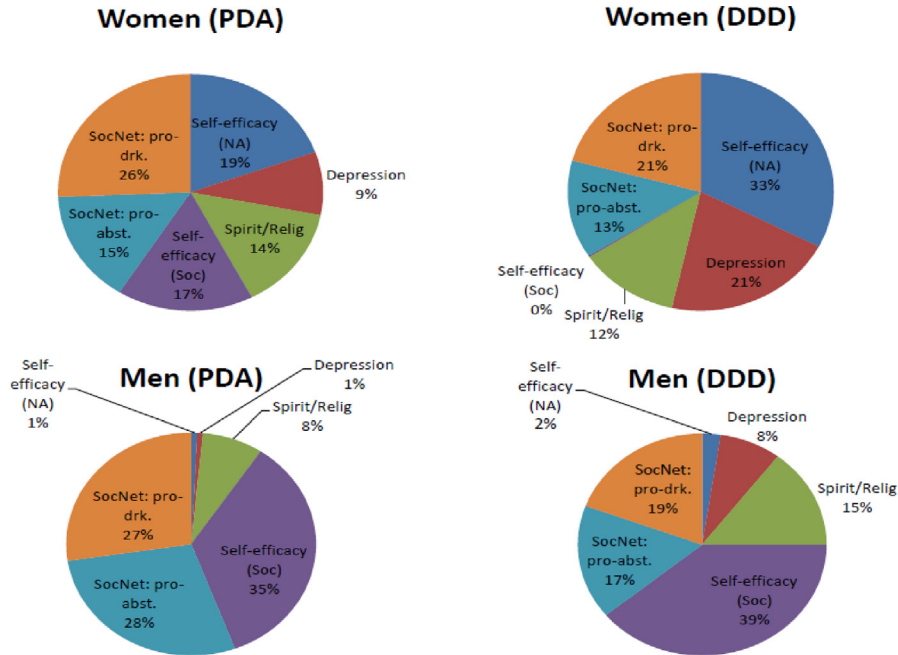


Fig. 4. (continued).

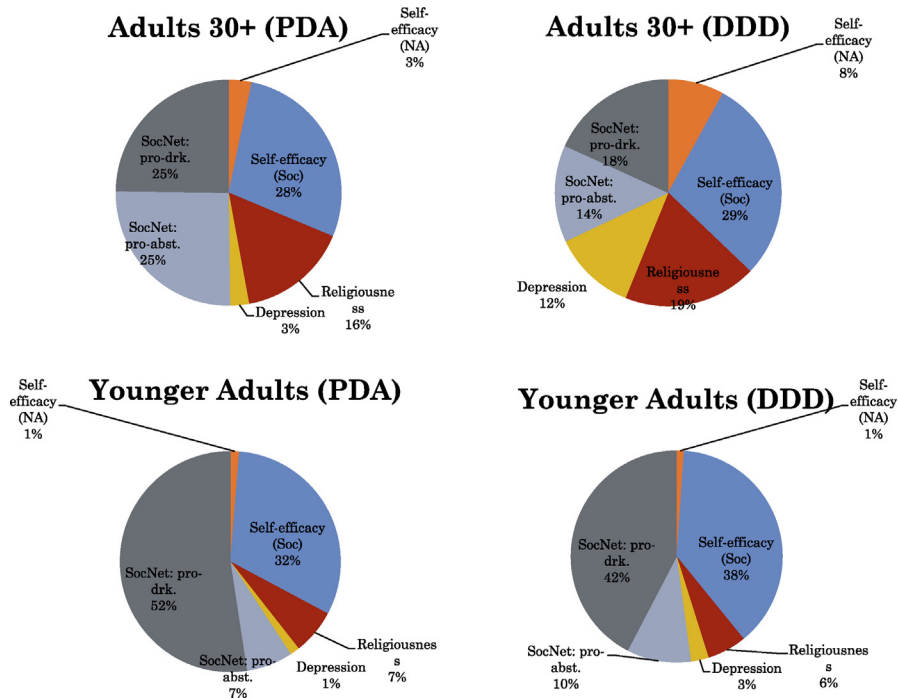


Fig. 4. (continued).

It is also noteworthy, that the 6 mediators that explained 50% of the direct of AA in preventing relapse for older adults, only explained 25% of this direct effect among young adults, despite young adults deriving the same degree of recovery benefit as their older adult counterparts. This means that we still have a lot to learn and investigate regarding how young adults, in particular, are benefiting from groups such as AA.

Summary of the Mechanisms of Behavior Change Research and Related Implications

In sum, this rigorous body of research on mechanisms of behavior change highlights a number of empirically supported mechanisms through which AA has been shown to confer benefit (Fig. 5). The findings have some potentially significant implications for how exactly AA and possibly other 12-step MHOs work to initiate and support addiction recovery.

The set of findings suggests the way AA works may have a closer fit with the broader pragmatic social, cognitive, and behavioral aspects of how its members stay sober documented in its later publications⁷⁰ than with its principle and original text, the *Big Book*^{14,50} first published in 1935 when the fellowship numbered only about 100 and consisted mostly of very severely addicted male patients (only 4 women), and based on the relatively little accumulation of sober experience (ie, most had short lengths of sobriety with a maximum of 3 to 4 years at the time of writing). The *Big Book*, first published in 1939¹⁴—with the main text remaining almost completely unchanged in the intervening years—relies heavily on the supposition that the liberating and curative active ingredients of recovery are explicitly spiritual as noted in its 12th step—“Having had a spiritual awakening as the result of these steps we tried to carry

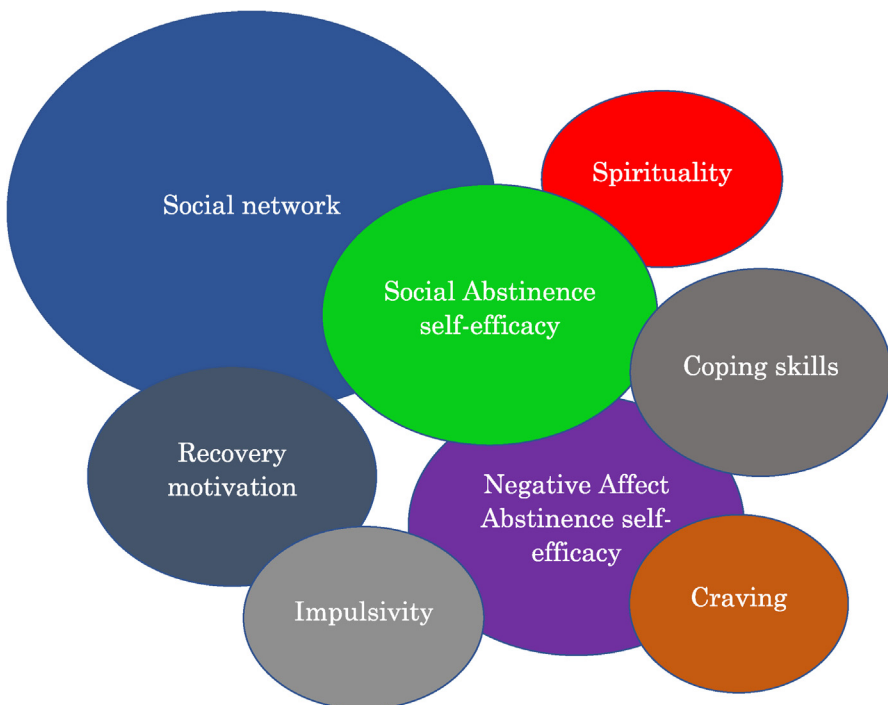


Fig. 5. Empirically supported mechanisms of behavior change through which alcoholics anonymous has been shown to confer recovery benefit.

the message to other alcoholics and practice the principles in all our affairs.” Interestingly, we have found support for “spirituality” being an important mechanism of behavior change in relapse prevention and recovery for AA participants, but only for those with more severe addiction.^{66,71} Consequently, given the clear severity of the documented addiction cases on which the Big Book^{14,50} and its 12-Step program is based, the reflections of the AA founders and early members that highlighted spirituality as an essential component of recovery may have been consistent with their actual observations at that time of these very severe cases (ie, spirituality was the answer). As the organization grew in size to several million;⁹), however, and become more demographically and clinically inclusive in the following decades (that is, about one-third are women and AA participants exhibit a broad range of clinical severity,^{72,73} it facilitated entry for less severe cases who seem to benefit from a variety of additional therapeutic elements that support recovery; and, for most, these benefits need not always include an explicit spiritual component.⁷¹ This, of course, may mean that irrespective of spiritual beliefs, or the degree of engagement with 12-Step specific spiritual philosophy or practices, many prospective AA participants can still benefit to a large degree from engagement with AA or other recovery specific 12-Step organizations.

For clinical providers, there are now numerous manualized, empirically supported TSF intervention protocols available that if adopted and implemented in clinical care settings are likely to produce higher rates of continuous remission or otherwise as good clinical outcomes as delivering other kinds of commonly used clinical interventions (eg, MET, CBT), while simultaneously providing greater reductions in health care costs.

CLINICS CARE POINTS

- For individuals with SUD who have also received professional treatment, clinicians’ opinions about mutual-help organizations (MHOs) such as AA, can have an impact on whether or not patients will attend.⁷⁴ Some clinicians may be unfamiliar with or object to particular aspects of 12-step (eg, spirituality). Some clinicians may not realize the potential of available community support networks to help sustain and complement professional treatment efforts and may even actively dissuade patients from participating in groups such as AA. Because of the increasingly compelling evidence base in favor of the use of MHOs, particularly, AA, for alcohol use disorder, and the fact that professionals have been found to substantially influence the likelihood that patients with SUD will attend such groups (for example,⁷⁴ clinicians should keep an open mind about the potential of these free, community-based resources to serve as a useful adjunct to treatment or as a form of continuing care after professional treatment has ended.
- Patients may oppose participation in AA or other 12-step organizations on grounds of spiritual incompatibility or other 12-step-specific aspects. In such cases, it can be helpful to inquire if such patients would be willing to sample other non-12 step alternatives such as SMART Recovery or LifeRing. There are also more religious alternatives to 12-step organizations, such as Celebrate Recovery (based on Christianity) and Refuge Recovery (based on Buddhist principles and practices). Some of these may be more palatable for certain patients. Also, some patients use a combination of mutual-help alternatives to help achieve and sustain remission.
- For reluctant individuals who may be willing nonetheless to at least sample some AA or other types of mutual-help meetings without investing too much effort or travel time, there are numerous online portals (eg, In The Rooms) that provide opportunities to observe, listen, and experience the nature and content of such meetings without the need to travel long distances or actively talk or otherwise participate. These might be prescribed as a way to introduce mutual-help practices to prospective patients who stand to benefit.

SUMMARY

A flurry of federally funded rigorous randomized clinical trials, cost-effectiveness, and mechanisms of behavior change studies during the past 30 years have now clarified the clinical and public utility and cost-benefits of AA, and also elucidated how AA confers benefits over time. In sum, a number of different modalities of professionally delivered TSF treatments demonstrate that these fairly unsophisticated linkages work at least as well as other empirically supported treatments such as cognitive-behavioral treatments on most outcomes, but TSF is able to produce superior outcomes when it comes to continuous abstinence and remission for alcohol use disorder. TSF also results in substantially reduced health care costs as patients are being admitted less frequently to the hospital or ED and also are relying more on peers with lived experience of active addiction and successful long-term recovery from it to remedy a variety of psychological challenges free of charge. AA and other ubiquitous, freely accessible and flexible, recovery-focused MHOs seem to be well-suited to the ongoing undulating course of addiction recovery risk. Given the burden of disease, disability, premature mortality, and economic costs, attributable to AOD use disorders annually in the United States and most other middle- and high-income countries globally, their ubiquity and utility may well be the closest thing public health has to a “free lunch.”

DISCLOSURE

Dr J.F. Kelly has received research funding from the National Institutes of Health (NIAAA, NIDA, NIMH), the Substance Abuse and Mental Health Services Administration (SAMHSA), the Department of Veterans Affairs, as well as state governments, and charitable foundations to conduct research on addiction, treatment, and recovery support services.

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