Published in final edited form as:

Curr Addict Rep. 2018 June ; 5(2): 134–145. doi:10.1007/s40429-018-0203-1.

MECHANISMS OF BEHAVIOR CHANGE IN 12-STEP APPROACHES TO RECOVERY IN YOUNG ADULTS

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Abstract

Purpose of review—Empirical evidence indicates that, in general, treatments which systematically engage adults with freely available twelve-step mutual-help organizations (TSMHOs), such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) often enhance treatment outcomes while reducing health care costs. Also evident is that TSMHOs facilitate recovery through mechanisms similar to those mobilized by professional interventions, such as increased abstinence self-efficacy and motivation, as well changing social networks. Much less is known, however, regarding the utility of these resources specifically for young adults and whether the TSMHO mechanisms are similar or different for young adults. This article provides a narrative review of the clinical and public health utility of TSMHOs for young adults, and summarizes theory and empirical research regarding how young adults benefit from TSMHOs.

Recent findings—Results indicate that, compared to older adults, young adults are less likely to attend TSMHOs and attend less frequently, but derive similar benefit. The mechanisms, however, by which TSMHOs help, differ in nature and magnitude. Also, young adults appear to derive greater benefit initially from meetings attended by similar aged peers, but this benefit diminishes over time.

Summary—Findings offer developmentally specific insights into TSMHO dynamics for young adults and inform knowledge of broader recovery needs and challenges.

Keywords

mutual-help organizations; mutual-aid; self-help; recovery management; 12-step groups; Alcoholics Anonymous; Narcotics Anonymous; emerging adulthood; young adults; mechanism; mechanisms of behavior change; mediation; moderated mediation; moderators

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Compliance with Ethics Guidelines

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

Conflict of Interest

The authors declare that they have no competing interests.

Introduction

The life-course approach to understanding substance use disorders and related conditions emphasizes developmental stages as important milestones that give rise to different risk and protective factors [1]. Ranging from fetus through birth, infancy, childhood, adolescence, young or "emerging" adulthood [2–4], and beyond, this life-course perspective recognizes and highlights an array of biological, sociocultural, and psychological factors that can heighten or lower the risk for the onset, progression, and offset of substance use disorders.

Of note, epidemiological data indicate the onset of substance use disorder and other forms of hazardous substance use in the US population and in most developed nations globally, occurs during young adulthood – a period typically represented by ages 18–29 years old [4–6]. These disorders have the ability to confer great harm during this otherwise, generally healthy, life-stage. More specifically, in developed nations, of any health risk factor affecting young adulthood, alcohol and other drug use contributes one of the highest burdens, in terms of disease, disability, and premature mortality, as measured by disability-adjusted life years (DALYs) lost. Worldwide, more than one-third of the disease burden attributable to alcohol use is accounted for by 15–29 year old individuals, while alcohol and drug use are the two leading risk factors for disease burden among 20–24 year old individuals [7, 8]. The reasons for these elevated risks associated with alcohol and other drug use (i.e., substance use) are complex. Researchers generally highlight the impacts of ongoing neurobiological maturation in frontal areas combined with role transitions marked by increased independence and stress, as well as socio-cultural contexts where substance use is reinforced [9].

Despite the obvious clinical and public health need for addressing substance-related harms during this critical life-stage, the bio-psycho-social developmental status and social context for young adults suggests that a straightforward application of adult-focused professional interventions for young adults may not produce the same degree of benefit because they fail to consider such developmental factors. Similarly, from a continuing care perspective, linkage to commonly used and freely available twelve-step mutual-help organizations (TSMHOs), such as Alcoholics Anonymous (AA) and Narcotics Anonymous (NA) may not be as effective because the vast majority of existing members of these organizations are much older [10], which may lead to less identification and sense of belonging [11], thereby decreasing the likelihood of engagement and benefit. But what is known, specifically, from an empirical standpoint about these free resources for young adults? And, are the mechanisms of behavior change through which TSMHOs have been shown to work for older adults, the same in nature and magnitude, for young adults? Greater knowledge could inform clinical and public health efforts to address young adult substance use disorder (SUD). In turn, these data could inform the field as to whether TSMHOs are a good fit or whether different alternatives should be developed.

This chapter begins by briefly describing some of the developmental factors specific to young adults that in theory could present barriers to youth participation in TSMHOs, and then, reviews what is known about young adult engagement with, and benefits derived from, these resources. Attention is then turned to what is currently known about the mechanisms and moderators of behavior change through which young adults have been shown to benefit

from TSMHOs and how these may differ from older adults. Finally, we discuss the implications of this research for clinical practice and recovery efforts more broadly.

Developmental Barriers to TSMHO Participation for Young Adults

Young adulthood is the life-stage during which young people typically leave their home and family of origin for the first time seeking more stable romantic partnerships, further education, work, and independent living [2]. “Leaving the nest” in this way brings with it inherent risks characterized by inexperience, trial and error learning, and the loss of immediate oversight and protection that parents, educational structure, and sometimes older siblings can provide. Failure to adapt successfully to meet these challenges can result in life-impacting problems [9, 12]. This stage of development is also characterized by greater impulsivity and risk-taking; presumably due to the evolutionary need for more diverse and expansive environmental exploration. During this life stage, the limbic system and other structures implicated in reward-seeking are well developed, while frontal areas implicated in goal-oriented behavior and response inhibition are still “works in progress”[12].

In addition to these neurocognitive and biological realities, there are cultural phenomena which add to the risks for young people when it comes to SUD. Specifically, in most western industrialized societies after the 1950s, there has been an increase in the availability of, and exposure to, potent illicit substances as well as licit ones, such as alcohol. Alcohol, in particular, is legal for consumption in most western societies at around age 18 years old (21 years old in the US). With perhaps an implicit desire for the “forbidden fruit” (in this case fermented fruit) and to fulfill normative adult cultural expectations, most young adults begin to consume alcohol regularly during this life phase. In fact, it is during this life-stage that the heaviest use of alcohol occurs in developed nations, as well as the development of alcohol use disorder. Similarly, for individuals who engage in regular cannabis use (e.g., weekly), this substance use pattern begins most often during young adult years [13]. The picture is similar for other drugs as well. For example, nationally-representative epidemiological data suggest that young adult rates of current alcohol (27%) and other drug use disorder (8%) are 2 to 3 times greater than those of 30–44 and 45–64 year olds [6, 14], and three times greater than adolescents [15]. The Institute of Medicine of the National Academies of Science [16] recommends that “federal, state, and local governments and nongovernmental entities that fund programs serving young adults or research affecting the health, safety, or wellbeing of this population should differentiate young adults from adolescents and older adults whenever permitted by law and programmatically appropriate.”

There is general consensus, that harmful substance use and SUD are related to health and well-being, necessitating examination specifically of SUD treatment and recovery approaches for this life stage. Thus, for those vulnerable to SUD, treatment, continuing care and recovery support services may need to be adapted to fit the developmental needs of young adults. In terms of TSMHOs, specifically, the majority of participants are much older with the average AA member around age 50, and the average NA member, age 48 (Kelly and Yeterian, 2013; AA, 2015, 2014 Membership Survey; [17]). This may create barriers which are: addiction specific; life-context specific; and 12-step specific [18–22].

Regarding addiction specific barriers, the degree, impact, and types, of substance use, engaged in by young adults entering TSMHOs may be quite different from the majority older members. Young adults for example, tend to have used a greater variety of substances together and often have not suffered from the same degree of physical impairment and damage as older existing members due the fact that they haven't used alcohol or other drugs for as long a period [29]. In contrast, they may have suffered greater psychological, social, and legal consequences which have contributed to their earlier TSMHO engagement. Overall, however, young adults may have lower levels of clinical severity than older adults. Clinical severity, and by association, more substance-related consequences, are robust predictors of affiliating with recovery support services and TSMHOs in particular [23–26]. Simply put, people who are suffering more tend to take more action to attempt to alleviate that suffering; TSMHO participation is one such strategy.

In terms of life-context specific barriers, young adults engaging with TSMHOs may have missed the developmental milestone of marriage and children due to SUD that is severe enough to have facilitated their TSMHO engagement [27]. Thus, a more predominant focus among existing older members on recovery challenges related to their own adult children, job/career, and marriage problems may leave younger adults feeling much of the conversation is irrelevant to their own life-context.

Furthermore, there may be 12-step specific barriers facing young people that may be less of a barrier for older adults. It is well known, for instance, that in the population religiosity and spirituality tend to increase with age. Consequently, the desire to spend more time discussing these components of 12-step philosophy and practices may be less appealing to young adults who wish to focus more on the social challenges of recovery [21, 28].

What is known about young adult engagement with, and benefits derived from, these resources

As highlighted above, participation can be broken down into attendance and active involvement. We organize this section according to tests of benefit derived from each of these two modalities of TSMHO participation. For a summary of these tests of TSMHO benefit, see Table 1 below [29].

In a study of over 300 patients (18–24 year old; $M_{age} = 20$ years) who attended residential SUD treatment in the mid-Western United States in a program specifically designed for young adults, the proportion who attended TSMHOs increased dramatically over time following treatment over a one year follow-up [30, 31]. While only 40% had attended a TSMHO meeting at pre-treatment, 90% attended a meeting by 3-month follow-up, decreasing only slightly at the 6- and 12-month follow-ups. Similarly, the average percentage of days attending a meeting and actively engaging with TSMHOs— using an index assessing the presence of, or participation in, eight activities (e.g., read 12-step literature, called a sponsor outside of meetings, met with other 12-step members outside of meetings, had read any 12-step literature outside of meetings, had spoken at meetings etc.) -- rose from baseline to 3-month follow-up, remaining fairly stable at 6- and 12-month follow-ups [30]. Participants derived both greater abstinence and heavy drinking-related reductions

in relation to TSMHO attendance across the first post-treatment year, using temporally-lagged analyses (e.g., 3-month attendance associated with 6-month abstinence), and controlling for several confounding covariates associated with better outcomes (e.g., commitment to sobriety at treatment entry). Controlling for covariates like this is a common strategy to isolate the effect of TSMHO participation on outcomes, thereby reducing the likelihood of a spurious effect.

More fine-grained analyses showed that young adults continued to derive benefit from attendance when active involvement was considered in the same model [30]. Like studies examining mainly older adults [e.g., 32], the effect of involvement on both abstinence and heavy drinking was stronger than attendance, however. Interestingly, in our study of 300 young adults the 12-step involvement effect on abstinence strengthened over the post-treatment year, while the attendance effect weakened. When the effects of TSMHO activities were explored one at a time, considering oneself a TSMHO member, and sharing at meetings were the strongest predictors of abstinence, while spending time with members outside meetings and step-work were the strongest predictors of reduced heavy drinking. In addition, the significant beneficial effect of active involvement on abstinence persisted even after taking post-treatment professional continuing care services into account in the model (e.g., residing in a sober living environment). Each additional TSMHO activity during a follow-up period (1-, 3-, 6-, or 12-months post-treatment) increased the odds of abstinence in that same time period by 25% [33]. We have also found that having a sponsor and contact with one's sponsor are associated with abstinence during the same time period [34]. One particularly novel finding in that study was that the *quality of the relationship* between the TSMHO participant and his/her sponsor – measured by an assessment of “sponsor alliance” adapted from a well validated measure of the professional therapeutic “working alliance” [35] – was uniquely related to abstinence. “Sponsor alliance” was an even stronger predictor of abstinence than having sponsor contact. Given the growing body of literature on the salutary effects of having a sponsor among adults [36, 37], early data on the importance of this core TSMHO relationship among young adults [34] suggest it is similar and merits further attention.

There have been several important secondary data analyses that have extracted a young adult sub-sample from the overall sample. In one such study, Delucchi, Matzger, and Weisner [38] conducted a secondary data analysis of 265 young adults (18–25 years) from a larger adult sample with either DSM-IV alcohol dependence (from the 4th edition of the Diagnostic and Statistical Manual of Mental Disorder) or “problem drinking” (meeting two of three harmful drinking criteria) recruited from treatment (outpatient and inpatient) or the community. At baseline – the only time point at which attendance was reported in the study 30% of the young adult problem drinkers had been to AA, while 51% of those with alcohol dependence had been to AA, a statistically significant difference. Overall, AA attendance was a significant predictor of both drinking volume and binge drinking in the year leading up to the 1-year, 3-year, 5-year, and 7-year follow-ups. This effect was independent of a host of demographic (e.g., ethnicity), clinical (e.g., baseline dependence symptoms and formal treatment attendance), and social factors (e.g., substance users in the social network).

Hoepfner and colleagues [39] also examined AA participation among young adults in a secondary analysis using Project MATCH data- a multisite controlled trial investigating the effects of randomizing patients to either 12-step facilitation, cognitive-behavioral treatment, or motivational enhancement therapy [40]. Reporting on all young adult participants (18–29 years) and controlling for treatment assignment and type of treatment, results showed a doubling in the proportion with any past 90-day attendance from 26% at baseline to 52% at 3 months (i.e., end of treatment). They also showed that, among attendees, mean percent days attending a meeting increased five-fold from 3% to 15% during this time. Young adults and older adults (30+ years) had similar proportions of any past-90-day AA attendance at baseline, though among attendees, older adults attended twice as frequently. At 3-month follow-up (i.e., post-treatment), 52% of young adults reported AA attendance in the past 90 days, significantly lower than the 64% of older adults. Again, among attendees, older adults went twice as often. Participants' AA attendance at 3-months was associated with both abstinence and fewer drinks per drinking day at 15-months [39]. Despite young adults' lower rates of participation, they and older adults both derived significant and similar abstinence-related benefit from AA attendance [39]. However, older adults derived more AA-related benefit for reduced drinking intensity (drinks per drinking day) than young adults.

In another study that only examined participation, including 98 young adults (18–25 years) with alcohol use disorder receiving outpatient SUD treatment, 68% reported lifetime meeting attendance at baseline and 36% considered themselves a member [41]. Weekly or greater 30-day attendance rose sharply from 26% at baseline to 51% at 3 months but declined essentially to baseline levels by 12-month follow-up (29%). Descriptive comparisons showed, compared to older adults (26+ years), young adults had similar rates of 30-day attendance at treatment entry, but lower rates of weekly attendance at 3-month (51 vs. 65%) and 12-month follow-ups (29% vs. 50%).

Other longitudinal studies have investigated TSMHO participation among adolescents over time through the transition to young adulthood. First, among a sample of 12-step-oriented residential SUD treatment patients initially 14–18 years old at baseline ($N = 166$; M age = 16), and followed for 8 years following inpatient treatment discharge, 90% reported any TSMHO attendance at 6-month follow-up, and 60% were still attending between months 7 to 12 [21]. Attendance declined through the transition to emerging adulthood at follow-up years 1–2 (50%), years 3–4 (45%), years 5–6 (40%), and years 7–8 (30%) [21]. Rates of weekly attendance showed a similar decline over time, starting off at 65%, but dropping to 35%, then 30%, 15%, 10% and 5%, respectively. Greater attendance during the first 6 months post discharge from inpatient care was associated with significantly better substance use outcomes up through 6-year follow-ups. Across the entire 8-year follow-up period (i.e., through the transition to emerging adulthood), each TSMHO meeting attended was prospectively and uniquely associated with an extra 2 days of abstinence in the next assessment period. Thus, approximately three meetings per week, on average, across the 8-year follow-up period, was associated with complete abstinence [21].

In a study of SUD outpatients (aged 13–18) enrolled in abstinence-based treatment where staff encouraged regular TSMHO attendance as part of a continuum of care (i.e., intensive

outpatient program followed by relapse prevention and continuing care; $N = 391$), 20% lifetime attendance at baseline increased to 42%, with 10+ meetings in the past 6 months at 1-year follow-up [42, 43]. Like Kelly et al. [21], attendance declined through the transition to emerging adulthood, including 12% with 10+ meetings at 3-year, 10% at 5-year, and 7% at 7-year follow-ups [42, 43]. A similar pattern emerged for active TSMHO involvement, where rates of considering oneself a member, calling other members for help, and having a sponsor, for example, decreased by half from the 3-year to the 7-year follow-up. In addition, this study also highlighted three long-term trajectories of TSMHO participation beginning in adolescence and continuing through emerging adulthood: 1) minimal or no attendance (60%); 2) attendance during the first year after treatment entry that drops off quickly thereafter (25%); and 3) attendance during the first year that drops off more gradually over several years (15%). Attendees with more gradual decline had 2 to 2.5 times greater odds of abstinence at 3-, 5-, and 7-year follow-ups compared to those with minimal/no attendance [42, 43].

Last, a study examined 564 young adult patients (18–39 years old) within a larger sample of adults attending a Health Maintenance Organization-covered outpatient SUD treatment program, which encouraged TSMHO attendance off-site [44, 45]. At 5-year follow-up, 34% of these young adults reported attending a meeting in the past year, and attendees went to 89 meetings, on average, corresponding with 24 percent days attending a meeting [44, 45]. Young adults and older adults (40+ years) attended a similar number of past-year meetings at several time points across 9 years of follow-ups, and had similar levels of active involvement measured by the AA Affiliation Scale at 5-year follow-up [44, 45].

In summary, these data highlight three patterns in young adults' TSMHO participation and derived benefit.

1. Young adults' participation can be clinically influenced with sharp increases in adolescent TSMHO participation after engaging in SUD treatment where attendance is actively encouraged or facilitated, with gradual decline thereafter in the transition to emerging adulthood. They appear to benefit from both TSMHO attendance and active involvement and like adults, involvement has greater benefits for increasing abstinence compared to merely meeting attendance.
2. Young adults demonstrate patterns of TSMHO participation consistent with prior known positive associations between SUD severity and participation among adults [23, 25, 46]. For example, young adults who attend inpatient or residential programs appear to participate in TSMHOs during and after treatment to a greater degree than those attending outpatient programs. Similarly, young adults on the whole appear to participate in TSMHOs to a lesser degree than their typically more severe older adult counterparts [39, 41].
3. As adolescent patients transition to emerging adulthood, and move further in time from an index treatment episode, their initially high TSMHO attendance declines. These data are consistent with a recovery management approach to the treatment of SUD in youth, where an initial treatment episode should be just the first step to a longer-term recovery plan [47–49].

One broad caveat to these findings is that programs from which participants were recruited, at a minimum, encouraged TSMHO participation, though not in all cases [39]. It seems unlikely that this degree of increased TSMHO participation among its young adult patients would be observed in programs that were less attentive to TSMHO participation [50].

What are the mechanisms through which MHO participation promotes better outcomes among young adults and what are the moderators of such benefits?

In analyses and summaries of the mechanisms of behavior change through which TSMHOs confer benefits among adults (18+ years) and adolescents (12–17 years) [51, 52], our group has found that participation in these free ubiquitous community-based recovery resources help individuals change their social networks towards those more supportive and conducive of abstinence and recovery, enhances common process mechanisms of abstinence self-efficacy, active coping, and motivation, reduces craving and impulsivity, and improves psychological well-being and spirituality [52]. Study of the young-adult-specific mechanisms through which TSMHOs have been shown to help young people has received comparatively little attention but some clues have emerged. Hoepfner et al. [39], for example, investigated the mechanisms through which young adults derive benefit from AA attendance using Project MATCH data, and whether these mechanisms differed from older adults. The study used a multiple mediation framework to examine 9-month mediators of the relationship between 3-month AA attendance and 15-month abstinence/drinking intensity for both young adults and older adults. The mediators examined included self-efficacy to cope with negative affect without drinking, self-efficacy to handle risky social situations without drinking, increased religiosity/spirituality, decreased depression, and increasing pro-abstainers and decreasing pro-drinkers in the social network (pro-abstainers were individuals who encouraged abstinence and/or discouraged drinking from the participant's perspective, while pro-drinkers encouraged drinking and/or discouraged abstinence). For young adults, only increased self-efficacy to handle risky social situations and decreased pro-drinkers in the network were significant mediators of the effect of AA on abstinence. They were less likely than older adults to increase their pro-abstinence networks via AA attendance. They also had significantly lower associations between improved drinking outcomes and enhanced self-efficacy to handle risky social situations as well as spirituality/religiosity. On the whole, all mediators accounted for 36% of the attendance-abstinence effect. The results for the drinking intensity model were similar, though the mediators accounted only for 22% of the attendance-drinking intensity effect. These were only about half the mediated effect that these same mediators were shown to explain among older adults [39, 52].

In our prospective observational study of young adults following residential treatment [30], we also investigated whether changes in social network members, characterized by their own substance use as either high-risk (e.g., “regular user”, “possible abuser”, abuser”) or low-risk (e.g., “infrequent user” or “abstainer”), mediated the effects of TSMHO attendance on substance use outcomes [53]. We observed an increase in low-risk friends and a decrease in high-risk friends from baseline to 6-month follow-up, and these changes were strongly associated with more abstinence and less heavy drinking (6+ drinks per day); however, of

note, TSMHO attendance was not associated with these network changes. In other words, in this study, these social network changes were not found to be related to TSMHO participation.

In contrast, in Chi et al.'s [42] study of adolescents through the transition to emerging adulthood, they found that adding number of family members and friends who supported participants' abstinence (as well as religious service attendance) to a model testing the effect of TSMHO attendance on 30-day alcohol abstinence at 3-years, reduced the effect of abstinence by more than 40%. This type of relationship between attendance, social support, and abstinence suggests a mediated explanatory effect, but it is important to note that these models were not temporally-lagged, which is required to show mediation (e.g., the outcome is preceded in time by the mediator which is preceded in time by the predictor). In fact, time-lagged effects of TSMHO attendance at 1-year on 3-year outcomes were non-significant, suggesting social network changes may not have been a true mediator of TSMHO effectiveness in this study either.

In addition to these more commonly tested mechanisms of TSMHO recovery, Blonigen, Timko, Finney, Moos, and Moos [54] tested whether reduced impulsivity explained AA benefit among young adults with alcohol use disorder and no previous SUD treatment recruited from a detoxification program or an SUD information and referral center. While reduced impulsivity has been studied comparatively less often than other TSMHO mechanisms (e.g., enhanced self-efficacy), it may be an appropriate target for investigation given its overlap with advice often heard in TSMHO meetings (e.g., "play the tape all the way through", meaning it is important to think through potential consequences of a decision before taking action). As hypothesized, decreased impulsivity did explain in part the effect of TSMHO attendance on each of several outcomes: a) reduced drinking consequences, b) increased self-efficacy to resist drinking, c) decreased emotional discharge coping (i.e., tension reduction-focused coping with the aim of avoiding the feeling), and d) increased general social support in the same year. These mediation models adjusted for drinking changes, suggesting the explanatory effect of reduced impulsivity is not accounted for simply by the impact of decreased drinking on improved behavioral control (i.e., reduced impulsivity). While this factor explained significant proportions of the effect of AA attendance on positive outcomes for EAs, this was not the case for older adults [54]. As such, reduced impulsivity may be an AA mechanism specific to the life stage of emerging adulthood. It is important to note that although these results highlight reduced impulsivity as a potentially fruitful mechanism of young adults' TSMHO benefit worthy of further investigation, the effects were not time-lagged similar to Chi et al. [42].

From the published empirical evidence to date specifically testing mediators of TSMHO-related behavior change, it appears that such participation may help young adults to reduce risky (substance-using) social network members, but does not appear to help in adding recovery-supportive members to their social networks. The older age composition of TSMHOs, and AA and NA in particular, with average ages of 50 years old and 48 years old, respectively, [17, 55], may limit the degree to which young adults engage with other members and develop new friendships. Finally, although models of TSMHO recovery for adults more generally may not fit as well for young adults, and the way they benefit remains

largely unknown, more recently delineated mechanisms, such as impulsivity, may explain at least some of the TSMHO recovery experience during this life-stage. More research is needed, however, to understand exactly how young adults are benefiting from these freely available community recovery resources.

What are the factors that influence young adults' participation and participation-related benefit (i.e., moderators)?

Studies that have examined factors which influence the degree of TSMHO participation and benefit (i.e., “moderator” studies) are organized below in relation to individual characteristics, meeting characteristics, and qualitative studies.

Individual characteristics

In our large young adult sample (Kelly et al, [30]), we found that young adult participants with co-occurring mood and anxiety disorders (47% of the sample; determined by structured clinical interview) had similar rates of TSMHO attendance and active involvement across the post-treatment year relative to their SUD-only peers [56]. Interestingly, despite poorer abstinence rates at 6- and 12-month follow-ups overall, the individuals with co-occurring disorders who had high active TSMHO involvement in the top half of the scale (five or more activities out of eight using a median split) had abstinence rates similar to their SUD-only peers. As such, young adults with mild to moderate co-occurring disorders may benefit more from higher levels of active involvement. Chi et al. [57] found that adolescents with co-occurring disorder as determined by clinical chart review (55% of the sample, including major depressive, conduct, attention-deficit hyperactivity, anxiety, psychotic, personality, and eating disorders), were more likely to attend 10+ meetings, and to engage in 3+ activities at 1- and 3-year follow-ups (but not 5- and 7-year follow-ups). Both groups demonstrated TSMHO attendance and active involvement-related benefit though their magnitude of benefit was not directly compared.

Other individual characteristics often leading to increased TSMHO participation relate to having more severe substance use problems, and in parallel, less perceived ability to moderate one's drinking and other drug use [21, 38, 42]. Importantly, studies generally do not support a relationship between attendance and demographic characteristics, such as race/ethnicity or gender [21, 42], or for religiosity [21].

Meetings and other 12-step characteristics

One of the primary characteristics thought to impact therapeutic change in a group setting is having a shared experience, or “universality” [11]. Due to the older adult majority in TSMHOs, as noted previously, being considerably younger could reduce this connection for young adults and influence rates of participation and benefit. Measured by an ordinal variable assessing the proportion of individuals present at meetings attended most often that were about the same age, attending meetings with similarly-aged individuals was associated with significantly better abstinence rates, particularly for individuals who were “on the fence” about AA/NA - attending fewer meetings overall and during the early months following residential treatment discharge [58]. Of note, however, was that those who

continued to attend meetings with similarly-aged peers had *worse* outcomes than those who attended meetings with older individuals by 12-month follow-up. A very similar dynamic pattern of relationships between meeting age composition and better outcomes was also found in a younger adolescent sample [20]. These findings suggest while attending meetings regularly with similar aged peers may be good for initial engagement and higher abstinence rates early on, it may be important to branch out and engage in meetings with a broader age-range of attendees, who have longer recovery, as well as greater life experiences.

Another factor moderating young adult participation in groups like AA is that for individuals whose primary substance is a drug other than alcohol the explicit alcohol focus in AA compared with the broader drug/substance focus in NA [59–62] could also reduce the therapeutic benefits of connecting with individuals around a shared, universal experience. However, we did not find evidence for a matching effect among young adults reporting a primary substance other than alcohol [e.g., opioids/stimulants/marijuana, referred to as, “primary drug patients”; 63]. Specifically, for these primary drug patients, a variable coding whether or not they attended more AA than NA in the first 3 months after treatment discharge, did *not* predict subsequent participation in, and benefit derived from, TSMHOs at 6- and 12-month follow-ups. While primary opioid and primary stimulant patients were more likely to attend NA than primary alcohol patients, all groups attended a similar number of AA meetings (~80% of total TSMHO meetings), on average, across the post-treatment year. Potential reasons for this include a) the common co-occurrence of alcohol and other drug use disorders (i.e., 62–80% of these “primary drug” patients also met lifetime criteria for an alcohol use disorder) and b) the conceptualization of their difficulties as “addiction” more generally, rather than addiction to any particular substance or group of substances. Both of these factors could help facilitate therapeutic processes of universality and cohesiveness [11] among group members.

Finally, our studies have shown that having a sponsor, contact with one’s sponsor, and having a good relationship with a sponsor (“sponsor alliance”) are related to TSMHO attendance and active involvement and better treatment outcomes [34].

Our group also examined qualitative data on young adults’ experiences in TSMHOs

by coding participants’ responses to several open-ended questions [Figure; 64]. Helpful aspects of meetings fell most readily into categories based on Yalom’s group therapeutic factors [11]. Results showed participants’ responses were most often consistent with universality/cohesion (43%) and installation of hope (24%). On the other hand, meeting structure (25%) and having to motivate oneself to attend (15%) were most commonly endorsed as aspects they disliked about TSMHO meetings, while logistical barriers (30%) and low recovery motivation (22%) were the most frequently cited reasons for discontinued attendance. Having the perception that one did not have a substance use problem or need treatment was the most frequently cited reason for never attending (41%). This pattern of results was consistent with a similar systematic qualitative study with adolescents [22].

Among a non-clinical sample recruited from a small liberal arts college and the surrounding community, interviews with 26 young adults (18–28 years old) who attended at least one AA or NA meeting [65] showed that many of the young adults viewed TSMHOs favorably.

However, those who had unfavorable attitudes were opposed to the concepts of powerlessness and reliance on a higher power in the TSMHO literature, as well as the slogans.

In sum, similar to older adults [66, 67], young adults with mild to moderate co-occurring psychiatric disorder (i.e., non-psychotic) may attend as much, or more, than their SUD-only counterparts. These young adult data are also consistent with findings in large, naturalistic adolescent SUD treatment studies [68]. However, the influence of chronic major depressive disorder and psychotic disorders, which may negatively impact one's ability to engage with the social milieu [69, 70], have not yet been examined. Finally, engaging with meetings that have high proportions of other young adults, as well as finding a compatible sponsor early in a treatment/recovery episode may promote subsequent recovery benefit. Taken together, these data suggest it may be helpful for young adults to engage with young adult-specific meetings initially, and then to branch out to meetings with older, more life-experienced, members with longer recovery time who could serve as stronger mentors and role models. Clinical interventions may be needed to facilitate these TSMHO activities among young adults, and to help them explore their opposition to TSMHO terminology and concepts, in the context of any perceived social advantages of the MHO milieu [9].

Conclusions

An increasingly rigorous and more analytically sophisticated body of scientific literature now reveals that TSMHOs, and AA, in particular are effective and cost-effective recovery support services [10, 71–73]. One major addition to this literature has been studies of TSMHO MOBCs, which have shown they work, in part, by mobilizing psychological and social processes similar to professional treatments [51, 52, 74]. These include increases in abstinence self-efficacy and motivation, as well as recovery-supportive social network changes [74]. In line with expert recommendation for research conducted specifically on young adults [16], we reviewed the literature, to date, on MOBCs in TSMHOs during this developmental stage, contextualized by findings on their benefit more generally as well as moderators of that benefit. This review showed that, compared to older adults, young adults benefit from TSMHO participation as much, but are less likely to engage with TSMHOs during and after treatment. Like older adults, more active involvement, including having a sponsor, may be an especially valuable TSMHO activity in terms of increased abstinence.

On the other hand, young adults may derive benefit in different ways than their older adult counterparts. They are less likely to enhance their abstinence-supportive social networks via AA, and do not demonstrate an association between changes in religiosity/spirituality and drinking outcomes as do older adults [39]. Overall, mediators that help explain AA-related benefit among older adults explain half as much of young adults' benefit. More work focused specifically on how young adults benefit from TSMHO participation is needed. Impulsivity – and the facets that comprise this complex construct, such as delay discounting [75] – represents a candidate mechanism that may be particularly relevant to the young adult AA experience, warranting further investigation [54]. Also important to consider as a candidate mechanism in future investigations given the fluid identities of many young adults [3, 4] is identification as an individual in recovery and/or a TSMHO member [30, 76]. Finally,

related to social network changes, future work might also test a potential moderated mediation effect, whereby young adults might add recovery-supportive individuals to their social networks via TSMHOs if they attend meetings that cater to young adult individuals.

In addition to research on impulsivity, our review gave rise to other potential directions for a preliminary research agenda targeting young adult MOBCs in TSMHOs.

First, research is needed on MOBCs in 12-step facilitation (TSF) interventions that link and engage young adults with TSMHOs. In Kelly et al. [50], for example, adolescents and young adults (ages 14–21) randomly assigned to an integrated TSF condition (iTSF) did as well as a motivational enhancement/cognitive-behavioral therapy (MET/CBT) condition in terms of days abstinent, but much better at reducing substance-related consequences across the entire follow-up. Also, that study found that, overall, greater participation in TSMHOs early following treatment was associated with greater abstinence.

Second, the Treatment Episode Data Set [77] shows 40–45% of young adults will present to SUD treatment with heroin or another opioid as their primary substance. Research is needed to test the benefit of TSMHO participation, as well as examine MOBCs of any observed benefit or iatrogenic effect, among these opioid-primary young adults, including but not limited to those who are prescribed empirically-supported medicines such as buprenorphine/naloxone, typically referred to by its brand name Suboxone [78–80]. While very little research has been conducted on this issue to date, and TSMHO attendees are likely to be exposed to anti-medication sentiment, both preliminary data [81] and theory suggest the two approaches may be used in tandem to more effectively help individuals with moderate to severe SUD [82].

Finally, young adult social lives (and the lives of a majority of all individuals in the US), integrate online and face-to-face experiences. In turn, there has been increased empirical attention to recovery-specific social network sites, and other types of online communities dedicated to helping individuals with alcohol and other drugs problems [83–85]. Data has shown, for example, that adults of all ages who use a recovery-specific site perceive benefit in terms of increased abstinence motivation and self-efficacy [83]. To date, however, little is known empirically about these modern social-recovery resources. Particularly given how prominent social network sites are in the day to day experiences of young adults (<http://www.pewinternet.org/fact-sheet/social-media/>) it will be important to examine whether and how young adults with SUD might benefit from participation in these online recovery-focused communities.

In conclusion, consistent with a call for research specifically on transitional age youth [16], data show young adults benefit from TSMHO participation, though clinical interventions may be needed to increase their levels of participation, which lags behind that of older adults. Importantly, older adult models of TSMHO MOBC may be inadequate to explain benefit among young adults. Preliminary data suggest a deeper investigation into how novel and innovative constructs may enhance our understanding of these phenomena, which would, in turn, help clinicians maximize patient outcomes, decreasing the overall disease burden attributable to substance-related harms during this vulnerable stage of the life course.

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Figure.

TSMHO Attendance (Left Axis) and Active Involvement (Right Axis) Over Time. From Bergman BG, Kelly JF, Fallah-Sohy N, Makhani S, in Smith, DC (Ed.) (2017) *Emerging Adults and Substance Use Disorder Treatment: Developmental Considerations and Innovative Approaches*, Figure 8.1, reproduced by permission of Oxford University Press. For permission to reuse this material, please visit <http://global.oup.com/academic/rights>.

Table 1

Overview of Effects of Twelve-step Mutual-Help Organization (TSMHO) Participation (Attendance and Active Involvement) on Alcohol and Other Drug Use. From Bergman BG, Kelly JF, Fallah-Sohy N, Makhani S, in Smith, DC (Ed.) (2017) *Emerging Adults and Substance Use Disorder Treatment: Developmental Considerations and Innovative Approaches*, Table 8.1, reproduced by permission of Oxford University Press. For permission to reuse this material, please visit <http://global.oup.com/academic/rights>.

First Author (Year)	TSMHO Fellowship	Age at Baseline (years) & % female	Setting	Last follow-up (years)	Modality	Measure	Benefit?
Delucchi (2008)	AA	18–25 39% female	I/O/C	7	Att	Yes/No	Y
Kelly (2008)	AA/NA	14–18; 40% female	I	8	Att	Number	Y
Chi (2009, 2012)	All	13–18; 34% female	O	7	Att	10+ (Yes/No)	Y
Kelly (2013)	All	18–24; 26% female	I	1	Inv	3+ Activities from AA Affiliation Scale (Yes/No)	Y
					Att	% Days	Y
					Inv	MMAS	Y*
Hoepfner (2014)	AA	18–29; 24% female	O	1.25	Att	% Days	Y

Notes: I = Inpatient/Residential; O = Outpatient; C = Community; Att = Attendance; Inv = Active Involvement; MMAS = Multidimensional Mutual Help Activity Scale (Kelly et al., 2011)

* Effect of active involvement on alcohol and other drug use is stronger than effect of attendance