
Adolescent Substance Use and Occupational Therapy Interventions: A Rapid Systematic Review

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Key Terms

- Substance use
- Adolescents
- Intervention
- Prevention
- Recovery
- Structured Activities
- Occupational therapy

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This rapid systematic review analyzes the evidence for substance use reduction through therapeutic interventions and activities in adolescents between the ages of 13-25, along with the potential for implementation in the field of occupational therapy. Adolescents with substance use disorders (SUDs) often have specific challenges regarding their family interactions, cultural beliefs, school engagement, and community support. It can be difficult for adolescents with SUDs to successfully navigate their ever changing lives, as they may also present with comorbid psychiatric conditions. It is noted that throughout this review, many interventions were the first of their kind and focused on targeting adolescents within the contexts of their environment. Many studies utilized specific techniques aimed at improving adolescents' intrinsic beliefs regarding their substance use. Overall, low to moderate evidence was found for the effectiveness of various interventions to reduce adolescent substance use. More exhaustive research is needed to evaluate the usefulness of these interventions, as many were done in very specific settings with very individualized populations. Moreover, occupational therapists should be cautious before implementation into practice, as none of the studies evaluated explicitly examined the role of occupational therapy. More investigation is required to determine how these interventions can be applied to the field of occupational therapy.

Focused Clinical Question

The purpose of this review was to systematically search the literature in order to critically appraise and consolidate the relevant evidence to address the following focused clinical question: In adolescents with and at risk for substance use disorders, what is the effectiveness of participation in interventions for supporting recovery and relapse prevention?

Statement of Problem and Background

Currently there is a plethora of research into intervention and recovery for adults with substance use disorder, but there is a deficit for adolescents (aged 13-25) of the same condition. There is a need for research involving adolescents and substance use disorders because adolescents use different substances and have different recovery needs than adults (National Institute of Drug Abuse [NIDA], 2014).

Rates of illicit drug use and binge drinking among teens and young adults are relatively high, and are especially prevalent among minority groups. In 2012, illicit drug use in the past 30 days was reported at 12% among 12-17 year olds and 26% among 18-25 year olds (Gonzales et al., 2014), and substance use has also been shown to be higher among sexual minorities than it is in their heterosexual peers (Hopkins et al., 2015).

There is also an elevated need for exploration on substance use, due to the advent of COVID-19. Exploratory research has found that adolescents are more likely to ignore social distancing guidelines to use substances with their peers in person, putting them at a higher risk for contracting COVID-19 (Dumas et al., 2020). This makes research on the participation in structured activities and interventions for recovery and relapse prevention all the more timely and important, especially when looking at how negative consequences, early morality, and high risk behaviors are associated with substance disorders that are left untreated (D'Amico et al., 2019).

Substance use is the leading cause of disease (D'Amico et al., 2019), in adolescents. According to NIDA, "When substance use disorders occur in adolescence, they affect key developmental and social transitions and can interfere with normal brain maturation" (2014). This indicates the need for our study in analyzing the evidence of current interventions because the issues listed above can interrupt one's occupational participation, cause worsening health outcomes, and disrupt one's social functioning. Occupational therapists can play a large role in recovery by assisting with establishing new routines, and returning to healthy occupations and roles. The purpose of this review is to assist occupational therapists in making evidence-based decisions regarding interventions for adolescents with substance use disorders.

Method for Conducting the Evidence-Based Review

This rapid systematic review examines the effectiveness of interventions that could fall within the occupational therapy scope of practice and address adolescent substance use. The articles included in this review were from the result of searches in PubMed, PsycINFO, and CINAHL databases.

This search was conducted by the review authors with guidance from the School of Health & Human Sciences and Ruth Lilly Medical Library librarians.

Search terms included in this review were adolescents, teenagers, youth, young adults, teens, substance use, substance abuse, drug addiction, drug use, prevention, intervention, treatment program, recovery, rehabilitation, healing, social participation, sports, sensory art therapy, treatment, therapy, and strategies. The review authors used MeSH terms to ensure inclusion of words and subjects that were associated with the search terms.

The articles selected for eligibility in this rapid systematic review included studies that focused on relapse prevention, substance use recovery, and prevention of initiation of substance use. Meta-analyses and systematic reviews were excluded from use. Initially, searches were restricted to be within the last 10 years, but this restriction was expanded to the last 15 when a limited number of studies were found.

The following inclusion criteria was used: (1) Age of participants 13-25 years, (2) within the occupational therapy scope of practice, (3) Level I, II, or III study design, and (4) conducted in North America or Europe. One additional exclusion criterion was pharmacological interventions. Covidence was utilized for the screening process of this systematic review (Covidence, 2021). One reviewer needed to approve an article from title and abstract review, and two people needed to approve an article from full text review for inclusion. Any conflicts were reviewed by the full review team for final determination on inclusion. Covidence produced a PRISMA diagram showing the inclusion process (Figure 1). Eleven studies were hand-selected and therefore are not included on the diagram.

This rapid systematic review used standards from the American Occupational Therapy Association (AOTA) on levels of evidence to rank the articles (AOTA, 2019). This ranking system was:

- Level I: Randomized controlled trials
- Level II: Two groups, nonrandomized studies (e.g., cohort, case-control)
- Level III: One group, nonrandomized (e.g., before-and-after, pretest and posttest)

The review team systematically analyzed the methodological soundness and quality of evidence for each article and reported strengths and weaknesses in the discussion section of this manuscript.

Results

A total of 30 articles were included in this rapid systematic review based on their adherence to inclusion and exclusion criteria. Of these articles, 19 were Level I Evidence, 3 were Level II Evidence, and 8 were Level III Evidence. The



Figure 1. PRISMA diagram

following six categories were identified to further organize these studies based on intervention type: culturally-specific interventions, family-based interventions, virtual interventions, 12-step programs, motivational interviewing and/or cognitive behavioral therapy, and school and community-based interventions.

Culturally-Specific Interventions

Culturally-specific interventions encompass those that are adapted to be specific for a minority group of adolescents with substance use disorders. This review found one Level I study and two Level III studies analyzing interventions specific to Latinx and American Indian/Alaska Native (AI/AN) populations. AI/AN youth use substances at a higher rate than their peers (Beauvais, 1996) and some research has shown that Latinx individuals experience higher rates of substance use disorders (CASA, 2011). This demonstrates a need for interventions for these populations. Historically, studies on substance use disorders have been conducted on white subjects (Whaley & Davis, 2007), but more recent studies have begun to address minority groups. Three studies examined the effectiveness of culturally-specific interventions on adolescents in minority groups.

One Level I randomized controlled trial (Burrow-Sanchez, 2019) investigated the effectiveness of culturally accommodated cognitive behavioral therapy with Latina/o adolescents with substance use disorder. The cultural accommodation aspects included discussions of real-life experiences with discrimination, experienced stressors, and the use of Latina/o names in examples. This study showed strong evidence for the effectiveness of culturally accommodated CBT in long-term effects only. It also demonstrated that parental familism can be a mediating factor.

One Level III cohort study (Kelley, Fatupaito, & Witzel, 2018) investigated the effectiveness of attending culturally-based prevention events on youth substance use in six Rocky Mountain region American Indian tribes. This intervention was not shown to be effective in reducing substance use.

There were many design flaws and unaddressed confounding variables that led to questionable validity of the results.

One Level III modified quasi-experimental study (Donovan et al., 2015) examined the effectiveness of a generalizable culturally-specific 12-session intervention for preventing substance use. The intervention was made generalizable to other tribes by the inclusion of “placeholders” where tribe-specific history and stories could be placed. This study provided evidence that this type of intervention can significantly reduce substance use and increase hope, optimism, and self-efficacy.

Family-Based Interventions

Five studies examined the effectiveness of family-based interventions. This category included multidimensional family therapy (MDFT), in which the intervention was inclusive of a family member.

One Level I randomized controlled trial (Mauro et al., 2017) examined the effectiveness of Risk Reduction Therapy for Adolescents (RRTA) in reducing substance use for adolescents who had been mandated into treatment by a juvenile drug court. RRTA involved the parents of the adolescent in each session and emphasized a collaborative partnership. This produced inconclusive results as to whether or not it was more effective than treatment as usual.

One Level I randomized controlled trial (Liddle et al., 2008) examined the effectiveness of multidimensional family therapy (MDFT) and cognitive behavior therapy (CBT) in reducing substance use related outcomes in adolescents. The interventions were delivered in 60-90 minute sessions held in an office and were distinctly different in how treatments were delivered but the same outcomes were measured. The results concluded both interventions as effective treatment options in decreasing cannabis consumptions and alcohol use. MDFT produced a significant effect in reducing problem severity, other drug use and zero or one occasion of use of all substances which continued 12 months after the participant concluded the intervention sessions.

One Level I randomized controlled trial (Henderson et al., 2009) examined the effectiveness of Multi-Dimensional Family Therapy (MDFT) and a peer group intervention on reducing substance use and abstinence rates in adolescents. Results concluded individuals who received MDFT reported less days of substance use and greater abstinence from drugs and alcohol for the year post-intervention ($p < 0.001$). Parental monitoring was identified as a mediator between decreased substance use and interventions.

One Level I randomized controlled trial examined if decision-making style predicted response to a brief intervention (BI) in reducing substance use amongst adolescents. The two interventions evaluated were brief intervention with the adolescent (BI-A) and brief intervention with additional parent session (BI-AP) (Piehler

and Winters, 2017). Overall, the study determined that both brief interventions were more effective with an adaptive problem solving style that was present in the participant. The participants in the BI-AP group were using marijuana less when compared to the BI-A group which is consistent with previous research.

One Level I randomized controlled trial conducted in the Netherlands (Hendriks et al., 2011) looked at the effectiveness of multidimensional family therapy (MDFT) when compared to cognitive behavioral therapy (CBT) in reducing cannabis use for treatment-seeking adolescents with a DSM-IV diagnosis of a cannabis use disorder. Both groups reported moderate clinically significant results on all accounts. The MDFT intervention did not report better results in terms of reported amount of cannabis use, reported amount of delinquent behavior, response to treatment, or treatment recovery during any of the follow-up assessments when compared to CBT.

Virtual Interventions

Virtual interventions included those that utilized a mobile phone or computer. Six studies examined the effectiveness of interventions involving texting or computer programs.

One Level I randomized controlled trial (Andersson et al., 2016) compared the effectiveness of Interactive Voice Response (IVR) versus IVR paired with IVR feedback on mental health symptoms and the impact of mental health symptoms on alcohol and drug use among adolescents receiving outpatient substance use services. IVR uses a programmed script to interact with participants, and IVR feedback in the intervention was personalized to participants' reported stress and mental health symptoms. While there was moderate evidence to support the intervention in improvement of symptoms of stress and anxiety, no significant effect was found on alcohol or drug use among participants in either group.

One Level I pilot randomized controlled trial (Gonzales et al., 2014) analyzed the effectiveness of a texting aftercare program compared to aftercare as usual (recommendation to a 12-step program) on relapse, substance use severity, and recovery behaviors in adolescents receiving treatment for substance abuse. Intervention participants received three types of text messages daily: self-monitoring, wellness tip, and substance abuse education and social support resources. Compared to the control, the intervention showed a significant decrease in substance use severity and relapse. Participation in 12-step programs and extracurricular activities was also significantly higher in the intervention group compared to the control.

One Level III cohort study (Haug et al., 2017) analyzed the effectiveness of a mobile-phone based life skills training program on alcohol use and cannabis use in adolescents at least 16 years old currently enrolled in vocational school. Participants received between two and four text messages

per week focusing on self-management skills, social skills, and substance use refusal skills. Using self-report measures, a significant decrease in at-risk alcohol use was found but there were no significant effects on cannabis use.

One Level I randomized controlled trial (Hopkins, J. et al. 2015) analyzed the effectiveness of a three session online intervention for sexual minority youth in the LGBTQIA+ community. The intervention focused on skills for identifying and managing stress, five-step guide for making decisions and drug use rates and refusal skills. Individuals in the intervention group reported less stress, past 30 day drug use, and peer drug use. These participants also reported higher coping and problem solving skills as well as drug-use refusal skills.

One Level I pilot randomized controlled trial (Trudeau et al., 2017) analyzed the effectiveness of supplemental online programming in reducing substance use in adolescents who were already receiving outpatient treatment. The intervention included participating in a minimum of 12/20 available online lessons over the course of 3 months. This study showed moderate evidence at increasing motivation to change, but only showed a decrease in substance use compared to the control group at 1 of the 3 follow-up time points.

One Level I randomized controlled trial (Walton et al., 2013) analyzed the effectiveness of computer brief interventions (CBI) and therapist brief interventions (TBI) on cannabis use, alcohol use, and other drug (illicit and non-medical prescription) use compared to a control group in adolescents ages 12 to 18 who are presenting to a federally-qualified health clinic. CBI utilized a computer program to administer role-play and decisional balance exercises. In TBI, therapists used motivational interviewing, open-ended questions, and role play exercises to encourage change. There was a significant decrease in cannabis use in all three groups. Short-term effects were found on other drug use, with a significant decrease at only 3 and 6 months in both intervention groups. There was no significant change in alcohol use in any group.

12-Step Programs

Three studies examined the effects of 12-step interventions on substance use, meeting attendance, and active involvement for adolescents struggling with substance use.

One Level III cohort study (Kelly et al., 2012) explored a treatment method that focused on Cognitive Behavioral Therapy (CBT), Motivational Enhancement Therapy (MET), and 12-step meeting models. The participants within this study attended weekly or bi-weekly group treatment sessions that were abstinence focused. Significant results showed that 12-step attendance and active involvement were strongly correlated with outcomes related to percentage of days abstinent (PDA).

One Level III cohort study (Kelly et al., 2016) examined the effectiveness of an intervention where adolescents who met DSM-IV criteria for substance use disorder attended ten therapy sessions. These sessions used a combination of Motivational Enhancement Therapy (MET), individual therapy (2), and group therapy, utilizing methods from Twelve-Step Facilitation (TSF) and Cognitive Behavioral Therapy (CBT) (8). Overall, participants' abstinent days increased significantly from baseline to the three month follow-up and those who attended more meetings had increased abstinent days.

One Level I randomized controlled trial (Kelly et al., 2017) analyzed the effectiveness of Integrated Twelve-Step Facilitation Treatment over Motivational Enhancement Therapy and Cognitive Behavioral Therapy in adolescents who meet DSM-IV criteria for substance use disorder and attend low intensity treatment in an outpatient facility. Percentage of Days Abstinent (PDA) was not different between control and intervention groups although researchers found that participants who were randomized to the iTSF group reported fewer substance use problems during treatment and at follow-up.

Motivational Interviewing and/or Cognitive Behavioral Therapy

Seven studies analyzed the effectiveness of Cognitive Behavior Therapy (CBT) and/or Motivational Interviewing (MI) in reducing substance use in adolescents.

One Level I randomized controlled trial (Stein et al., 2011) evaluated the benefits of utilizing motivational interviewing over relaxation training in reducing marijuana and alcohol use in incarcerated adolescents. All participants in the study were recruited from a Northeastern U.S state correctional facility, most were male, and a majority of them also received the standard care psychoeducational program delivered at the facility. Statistical significance and small to medium effect sizes were reported when looking at post-treatment effects after the adolescents left the facility, in a greater reduction in the average number of drinks per day, percent of heavy drinking days, and percent of days when >5 drinks were consumed in the MI group over the relaxation training group.

One Level I double-blinded randomized controlled trial (Spirito et al., 2018) compared motivational enhancement therapy (MET) for adolescents with a history of substance use and school truancy, in combination with a Family Check-Up (FCU) program, over a psychoeducation (PE) program, in reducing marijuana use, alcohol use, and truancy. Overall, more favorable outcomes were found for the MET/FCU group over the FCU group, when looking at lower rates of marijuana (MJ) use, drug use, and truancy, with low to moderate clinical effects.

One Level I randomized controlled trial (Brown et al., 2015) analyzed the effectiveness of motivational

interviewing (MI) in combination with treatment as usual for hospitalized adolescents with one or more psychiatric disorders as compared with primarily treatment as usual (TAU) in reducing reported substance use and psychiatric symptoms. Results indicated the MI treatment group had a longer delay between their time to use a substance after discharge from the hospital ($p=0.008$), had reductions in their total use of a substance during the 6 months after discharge ($p=.047$), and reported less rule-breaking after discharge. However, all of these results were negligible after 6 months, and no significant findings were found during the follow-ups over months seven to twelve after hospital discharge.

One level III single-group nonrandomized pre and posttest study (Fortuna et al., 2018) examined the effectiveness of MBCT-dual manualized therapy for adolescents with post-traumatic stress disorder (PTSD) and substance use. The therapy was a combination of CBT and mindfulness therapy and was delivered in both English or Spanish. No significant improvements were seen in a reduction on the severity of one's substance use, but there was a significant reduction in cannabis use specifically. In addition, statistically significant and medium to large clinical effects were seen pre- and post-test with improvements in PTSD symptoms, a decrease in the severity of PTSD impairments, a decrease of trauma-related cognitions, and a decrease in depressive symptoms.

One Level I randomized controlled trial (Mason, et al., 2015) examined the effectiveness of a single Peer Network Counseling session when compared to a single informational session in reducing substance use for adolescents who do not have a clinical diagnosis of substance use disorder. Gender effects on substance use found a decline among boys in the intervention condition but no significant outcome for girls in the intervention group. Regardless of gender the treatment had the best outcomes with participants with a protective peer network.

One Level I randomized controlled trial (D'Amico et al., 2020) examined the benefits of a 15-20 minute motivational interviewing intervention before primary care appointments in reducing alcohol and marijuana use in adolescents. Participants either received brief motivational interviewing intervention or received usual care. Adolescents in the CHAT group demonstrated less alcohol use, heavy alcohol use, and less negative consequences of alcohol compared to teens in the usual care group. Overall the study was methodologically sound and demonstrated evidence to support the intervention.

One Level III cohort study examined the effectiveness of the Seven Challenges program in reducing adolescent substance use and assessed the generalizability of the program through exploring the use in different settings (Korchmaros, 2018). Overall, the results concluded the intervention to be effective in reducing substance use, mental-health related issues, and criminal actions. All p-

values reported demonstrate significant differences ($p < .001$) in results from pre- to post-intervention and effect size was reported to be small to moderately sized in all categories of results.

School and Community-Based Interventions

Five studies examined the effectiveness of various school or community-based interventions on adolescent substance use and on relevant risk factors for substance use.

One Level II case-control study (Trujillo et al., 2019) examined the effects of animal assisted therapy (AAT) in a school-based mental health and substance treatment setting on adolescents with a substance use disorder diagnosis. The study found that adolescents participating in AAT with a certified therapy dog had a significant increase in the number of sessions attended and in overall well-being as compared with adolescents who participated in regular therapy with a counselor. The intervention group also had school engagement scores more than double the scores of the control group, though this difference was not statistically significant.

One Level II case-control study (Maalouf et al., 2019) measured how participation in a school-based prevention intervention focusing on teaching skills to build resilience against substance use, called Lions Quest Skills for Adolescence (LQSFA), affected substance use in adolescents in three Eastern European countries. The results showed that students participating in the intervention had significantly lower intention to use substances (marijuana and cigarettes) in the next 3 months and significantly lower prevalence of substance use (marijuana and cigarettes) in the last 30 days in two of the countries as compared with students receiving regular school curriculum.

One Level I randomized controlled trial (Butzer et al., 2017) found that a yoga intervention implemented during physical education classes for 7th grade students resulted in significantly greater increases in emotional self-control for females as compared with students receiving normal physical education. Students not receiving the yoga intervention were also found to have a significantly greater willingness to smoke cigarettes than students in the intervention group.

One Level III study (Bettmann et al., 2012) examined the effects of an 8-week wilderness therapy program on adolescents diagnosed with a substance use disorder. The intervention included 8 weeks of therapy in a group setting while living in a community in a wilderness environment. The results showed that participation in the program resulted in clinically and statistically significant improvement in overall well-being and that positive treatment outcomes were maintained after a follow-up interval of 6 months.

One Level II case-control study (Kristjansson et al., 2010) found that participation in a community-based substance use prevention program resulted in significant

reductions in alcohol use and intoxication as well as reductions in going to parties for adolescents in Iceland. There was also a greater reduction in daily smoking in adolescents participating in the program as compared with those not participating, though not statistically significant.

Discussion

This rapid systematic review analyzed 30 articles and found evidence supporting the use of the following interventions in reducing substance use in adolescents: culturally specific interventions, family-based interventions, virtual interventions, 12-step programs, motivational interviewing, and cognitive behavioral therapy. The following interventions were found to be moderately effective in reducing substance use in adolescents: school-based interventions (yoga, animal-assisted therapy, skills-building), 12-step programs, self-driven virtual interventions, motivational interviewing and/or CBT, and multidimensional family therapy.

Some of the interventions investigated were found to need further research done before a definitive claim about their efficacy was made. One such intervention type was culturally-specific interventions. Each study was the first of its kind, as they were trialing newly designed interventions. This category has moderate evidence, with mixed results as to the effectiveness. Another intervention needing further research is wilderness therapy. Positive results were found but the study design was weak and did not include a control group. Virtual brief interventions also need further research as the results were not consistent at follow-up points. Further research with more robust study designs could clarify the effectiveness of these three intervention types.

Limitations

There were low to moderate levels of evidence suggesting that many of these interventions may have the capability of improving substance use in adolescents, but more research needs to be done in this area before widespread implementation should be considered.

Common limitations throughout this rapid systematic review include lack of a control group, no-follow-ups to determine if intervention effects continued after cessation, short follow up periods, and a self-reporting of substance use that could have affected the validity of the results. A lack of diversity in subjects also presents a potential limitation in the generalizability in many of the interventions. Many of the studies examined groups of people, populations and cultures, and many were limited to specific geographic locations, thus, the varying perspectives and cultural beliefs regarding substance use make the results very specific to only certain populations.

It is important to emphasize that none of the articles specifically mentioned or analyzed the role of occupational therapy in utilizing these interventions. Thus, while many of the specific methods, steps, and ideologies fall within the scope of occupational therapy, one is cautioned against utilizing these interventions without additional training and formal supervision, as results will vary based on treatment provider.

The results of this RSR are also limited in that our search only included 30 articles, so significant results and interventions could have been missed. Other method limitations include the use of only three search databases from which to screen articles, the use of specific search terms, and the use of 11 hand-selected articles, which could have introduced the potential of review-bias in the interpretation of this RSR.

Implications for Occupational Therapy Practice

The scope of occupational therapy encompasses all of the interventions examined in this review and these interventions can be adapted to be implemented in occupational therapy practice to decrease substance use in the adolescent population.

- Occupational therapists should conduct research focusing on decreasing substance use among adolescents in order to determine interventions that can easily be utilized in outpatient, inpatient, school, and community settings.
- The holistic nature of many of the interventions make them appropriate approaches that could be utilized by occupational therapists.
- Additional research should be conducted to generalized populations that are more diverse and focus on a wider range of adolescents to ensure proper generalizability.
- It should be emphasized that the findings presented in the current study were not specific to the context of occupational therapy, but can be altered to fit in the scope of practice, with additional training and education as needed.

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Table 1: Evidence Table				
Type 1: Culturally-specific interventions				
Author (Year)	Level of Evidence/Study Design/Participants/Inclusion Criteria	Study Groups	Outcome Measures	Results
Burrow-Sanchez (2019)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=70 Latinx adolescents (ages 13-18) with substance use disorders</p> <p>Inclusion Criteria: ages 13-18 years, having parental/adolescent consent/assent, meeting DSM-IV-TR criteria for alcohol or drug abuse/dependence and self-identified as Latina/o or Hispanic</p>	<p>Control: Group-based cognitive behavioral therapy (S-CBT)</p> <p>Intervention: Culturally accommodated cognitive behavioral therapy (A-CBT)</p>	<p>Primary Outcome: number of days substances were used in the 90-day period prior to each assessment point. Measured using the Timeline Follow Back (TLFB) tool.</p> <p>Secondary Outcomes: mediating effects of acculturation, ethnic identity, and participant and parental familism. Measured using the Acculturation Rating Scale for Mexican Americans-II (ARMSA-II), the Multi Ethnic Identity Measure (MEIM), and the Familism Scale (FS).</p> <p>Outcomes were measured pre-treatment, post-treatment, and 3-, 6-, and 12-months post-treatment.</p>	<p>It was found that there were statistically significant differences at each timepoint within the S-CBT group and within the A-CBT group. Statistically significant differences were only found between the groups at the 12-month time point, with the A-CBT group having significantly less substance use. Analysis of the mediating factors indicated that the only factor with a significant impact was parental familism.</p>
Donovan et al. (2015)	<p>Level of Evidence: III</p> <p>Study Design: Modified Quasi-Experimental design; similar to a wait-list control</p>	<p>The participants were divided into groups based on which tribe they were a member of. They received the same basic treatment,</p>	<p>Primary Outcome: substance use. Measured using items from the Washington State Healthy Youth Survey.</p>	<p>Analysis showed that the two groups were statistically similar enough to combine for data analysis. The combined group results</p>

	<p>design.</p> <p>Participants: 23 high school age students in the Suquamish and Port Gamble S'Klallam tribes.</p> <p>Inclusion Criteria: No inclusion criteria outside of age was utilized. It was important to tribal leaders that anyone who wanted to participate be given the opportunity to engage in the workshops.</p>	<p>however, each group had elements that were specific to their culture. Placeholders were built into the 12-session intervention framework to allow for specification by culture. Interventions were provided at 3 2.5-3 day workshops over the course of 3 months.</p>	<p>Secondary Outcomes: Cultural identification and participation in cultural activities. Measured using a newly designed tool that combined elements of the Multigroup Ethnic Identity Measure, the American Indian Enculturation Scale, and the Traditional Activities Scale.</p> <p>Hope/optimism/self-efficacy. Measured using the Questions about Your Goals Questionnaire.</p> <p>Substance abuse knowledge. Measured using a 21-item newly designed test developed from information from the NIDA for Teens Drug Facts and from the National Institute on Alcohol Abuse and Alcoholism Fact sheets.</p> <p>Outcomes were measured pre-intervention, post-intervention, and 4-months post-intervention.</p>	<p>showed significant increases of hope/optimism/self-efficacy at both the post-intervention and 4 month follow-up. The combined results also showed significant reduction in substance use at both time points. Knowledge about substances was only significantly different at the 4-month time point, and cultural identification/participation in cultural activities showed no significant differences.</p>
<p>Kelley, Fatupaito, & Witzel (2018)</p>	<p>Level of Evidence: III</p> <p>Study Design: Cohort study</p> <p>Participants: N=569 youths from six American Indian communities in the Rocky Mountain Region.</p> <p>N=180 representatives of</p>	<p>Intervention: N=200. Survey respondents who had attended at least one culturally-based prevention activity.</p> <p>Control: N=369. Survey respondents who indicated they had not attended at least one culturally-based</p>	<p>Primary Outcomes: Substance use, culture, community connections, social support, self-esteem, and family communications about substance use.</p> <p>These outcomes were measured using data from the survey that had been developed and piloted</p>	<p>Social support and community connections were significantly higher in the intervention group. Substance use was not significantly different between the groups. Family communication about substances was significantly higher in the non-intervention group. Community readiness</p>

	<p>different community segments for the community readiness assessment (CRA).</p> <p>Inclusion Criteria: Surveys were given to middle and high school students of the six communities and then were divided into groups based on whether or not they reported participation in a culturally-based prevention activity.</p> <p>Selection of CRA participants was up to the discretion of the site coordinator.</p>	<p>prevention activity.</p> <p>CRA: N=30 participants per community that were selected by site coordinators based on their representation of a community segment. They were administered a 13-question survey to determine their perception of community readiness.</p>	<p>in the community.</p> <p>Secondary Outcomes: Community readiness. Assessed through interviews that addressed four areas: community knowledge of efforts, leadership, community climate, and community knowledge of the issue.</p> <p>Community involvement. Analyzed through collection of data about the number of people who received information about culturally-based prevention or attended a prevention activity.</p> <p>Primary outcome measurement and CRA was conducted pre- and post-intervention (3 years into a 5 year trial). Engagement was analyzed yearly.</p>	<p>average scores decreased throughout the intervention, and community involvement massively increased (365%). No other significant results were reported.</p>
Type 2: Family-based interventions				
Author (Year)	Level of Evidence/Study Design/Participants/Inclusion Criteria	Study Groups	Outcome Measures	Results
Henderson et al. (2009).	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=83 The participants were</p>	<p>Intervention: Adolescent group therapy (N=43) involved a manual-guided intervention based on principles of social learning and cognitive behavioral therapy. This intervention</p>	<p>Primary Outcomes: Substance use was measured using the Timeline Follow-Back Method (TLFT) to provoke recall.</p> <p>Parenting practices were</p>	<p>The results suggest that MDFT can improve parental monitoring more than peer therapy, which positively impacts substance use. Additionally, MDFT was more effective than peer</p>

	<p>recruited for the study through schools, juvenile justice system, substance abuse facilities, mental health facilities, and others such as parent recommendation.</p> <p>Inclusion Criteria: between ages 11 and 15, referred to outpatient treatment due to substance use, living with parent or caregiver willing to participate in therapy process, not currently receiving detoxification or inpatient care, and no risk of suicide.</p>	<p>was held in clinic offices in groups of 4-6 participants with one therapist leading the session.</p> <p>Intervention: Multidimensional family therapy (MDFT) (N= 40) includes four distinct domains including: adolescent, parent, family interaction, and extrafamilial domain. This intervention approach allows the therapist to meet individually with the child and caregiver, as well as together. Additionally, the therapist is able to collaborate with outside influences such as school, any juvenile relations, or social system the child operates within.</p>	<p>examined through the Adolescent Daily Interview (ADI) which analyzes family interactions over the last 24-hours by use of a check-list. The ADI assessed three components including: quality of parental relationship, level of monitoring, and negative relationship.</p>	<p>group therapy in abstaining from drug use.</p>
Hendriks, V. et al. (2011)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N= 109 male (79.8%), Dutch/western (71.6%), currently attending school (73.4%) (cannabis use past 90 days mean=62.7 ST=23.1) (cannabis use past 90 days, joints smoked mean=161.6 ST=128.7), (any alcohol use past 90 days mean=9.9 SD=13.2) any</p>	<p>Intervention: multidimensional family therapy (MDFT), group sessions that were developmentally based and focused on treating the adolescents in the context of their family, social, peer, and judicial, environments. These sessions happened 2x a week for 1 hour at a time, for 5-6 months, and included the adolescent, their family/parents, and other individuals apart of the</p>	<p>Primary Outcome: Adolescent Diagnostic Interview, given at baseline to see if they met criteria of DSM-IV diagnosis of cannabis use disorder</p> <p>National Institute of Mental Health Diagnostic Interview Schedule for Children Version IV, given at baseline to also look at substance use</p> <p>Dutch version of Family Environments Scale subscales Conflict, given at baseline to</p>	<p>The MDFT intervention did not report better results in terms of reported amount of cannabis use, reported amount of delinquent behavior, response to treatment, or treatment recovery, during any of the follow-up assessments, when compared to CBT. Both reported moderate treatment effects (Cohen's D 0.39-0.61).</p>

	<p>alcohol use past 90 days glasses/units mean=62.4 ST=107.1)(other substance use past 30 days 9.2%).</p> <p>Intervention group MDFT: N=55 Comparison Group; CBT: N= 54</p> <p>1 participant from the MDFT group and 7 participants from the CBT group never received the intervention after assignment N=54 actually received the MDFT intervention, and N=47 actually received the CBT intervention. At the 12-month follow-up, both the MDFT group and the CBT group individually lost 3 participants</p> <p>Intention-to-treat analysis was performed to calculate all drop-outs from baseline.</p> <p>No significant differences found between the MDFT group at baseline or follow-ups.</p> <p>Inclusion Criteria: All participants recruited from a region called The Hague located in the Netherlands, from either the Brijder Mistral Addiction Treatment, or at De</p>	<p>adolescents' school, court, or social environment. Delivered by trained therapists, who used an MDFT treatment manual, and trained by the original founders of MDFT approach.</p> <p>Control: cognitive behavioral therapy (CBT), conducted by certified therapists who followed a CBT treatment manual, and who had supervision from an experienced therapist, to promote motivation to change substance use behaviors, and harmful thinking, through coping skills and self-control training, with individual sessions 1w for 1hr, for 5-6 months. The adolescents' parents from this group also received treatment sessions every month for support and education.</p> <p>Because # of treatment days varied based on the intervention group, an individual was considered to complete their treatment if they attended 75% of their planned sessions.</p>	<p>look at family life</p> <p>Personal Experiences Inventory subscale, Personal involvement with chemicals, to look at adolescents substance use and it's psychological effects</p> <p>Parent and Adolescent Interview with items from Addiction Severity Index and Self-Report Delinquency Scale, given at baseline, 3,6,9, and 12 month follow-ups.</p> <p>Timeline Follow-Back, given at baseline, 3,6,9, and 12 month follow-ups, to measure the amount of substance use that occurred before each follow-up</p> <p>Urine samples collected at month 12-screened for tetrahydrocannabinol, to compare to self-reports at month 12</p>	
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	<p>Jutters Palmhuis, (treatment program for adolescents), between March 2006-July 2009. All 13-18 years old, had a DSM-IV diagnosis of a substance use disorder, used cannabis on a regular basis, consented to be a part of the study, had a guardian who consented, and all spoke Dutch.</p>			
Liddle et al. (2008)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=224 The participants were referred to the study from the juvenile justice system, child welfare service agencies, schools and other sources.</p> <p>Inclusion Criteria: between the ages of 12 and 17.5 years old, living with parent or caregiver who could engage in family therapy, no prior experience with organ dysfunction, no receiving detoxification in in-patient setting, and no risk of suicide.</p>	<p>Intervention 1: Half of the participants received Cognitive behavioral therapy (CBT) (N=112) in 60-90 minute weekly sessions. The CBT treatment was organized in three stages. The first stage identified and prioritized problem areas with the parent/caregiver present for the first two sessions to provide their insight as well as offer support through the process. The second phase carries out the actual CBT through increasing coping skills, and reducing threatening behaviors to quality of life and well-being. This phase emphasizes decreasing harm and not abstinence. The third and final phase is centered on relapse prevention through problem-solving and</p>	<p>Primary Outcomes: Frequency of substance use, cannabis use, and other drug use in the last 30-days were primary outcomes measured. The Time-Line Follow-Back (TLFB) is a memory prompt method used to recall frequency in the last 30-days.</p> <p>Secondary Outcomes: Abstinence in the last 30 days and intensity of substance use problem. Intensity of substance use problem was measured through frequency and psychological components. The Personal Experience Inventory (PEI) is a 29-item measure that focuses on psychological aspects of substance use, as well as related consequences.</p>	<p>The results concluded both interventions as effective treatments in decreasing cannabis consumptions and alcohol use. MDFT produced a significant effect in reducing problem severity, other drug use and zero or one occasion of use of all substances which continued 12 months after the participant concluded the intervention sessions.</p>

		<p>resistance to peer pressure.</p> <p>Intervention 2: Half of the participants received multidimensional family therapy (MDFT) (N=112). MDFT is organized in specific domains addressing the adolescent, parents, both, and "extrafamilial". The adolescent domain focuses on communication with family, coping skills, emotional regulation, improving school functioning, and creating replacements for substance use. The parent/caregiver domain focuses on involvement with the child, commitment to therapy process, parent skills, monitoring, child expectations, consequences, and their personal psychosocial components. The parent/caregiver and child domain is centered around family conflict and resolution, emotional attachments, and communication skill building. The "extrafamilial" domain is structured around other influential systems in the child's life such as school, social, or juvenile systems. Depending on the domain being addressed,</p>		
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		therapist may meet with just the child or parent or both.		
Liddle, H. A. (2018)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N= 113</p> <p>Inclusion Criteria: Ages 13-18, diagnosed with substance use disorder, diagnosed with at least one mental health disorder, referred and approved by the State of Florida Department of Children and Families (DCF) for residential substance use treatment, known to have failed previous substance use treatment, living with parent/caregiver at time of referral, not currently suicidal or demonstrating psychotic symptoms, not diagnosed with autism or other intellectual disability</p>	<p>Intervention 1: Multidimensional Family Therapy (MDFT)</p> <p>MDFT was provided by a therapist to each individual family. The therapist meets with the adolescent alone, with the caregiver (s) alone, and with the family together. The goal was to help the adolescents develop and improve their emotion regulation, coping skills, effective communication, and social competence. The therapist also helped the parents develop problem solving skills and an understanding approach to conflict. The goal of the family sessions was to develop problem-solving skills, improve communication, and improve emotional attachments among adolescents and caregivers. Outcomes were measured at baseline, 2 months, 4 months, 12 months, and 18 months.</p> <p>Intervention 2: Residential Treatment (RT)</p>	<p>Primary Outcomes: Substance use, measured using The Personal Experience Inventory (PEI) and the Timeline Follow-Back Method (TLFB)</p> <p>Frequency of delinquent behaviors, measured using the National Youth Survey Self Report Delinquency Scale</p> <p>Externalizing symptoms, measured using the Externalizing subscale of the Youth Self-Report</p> <p>Internalizing symptoms, measured using the Internalizing subscale of the Youth Self-Report</p>	<p>From baseline to 2 months, there was a significant decrease in all outcome measures in both intervention groups. From 2 months to 18 months, participants in RT demonstrated an increase in substance use and delinquent behaviors from the 2 month follow up assessment, while participants in MDFT maintained their decrease in substance use and delinquent behaviors. Both groups showed an improvement in externalizing and internalizing symptoms, but there were no significant differences between the groups.</p>

		Participants received both group and individual therapy at Village South, Inc. in Miami. Participants received psychiatric services, vocational training, education, and recreational therapy, and parents/caregivers were involved in the treatment process and offered participation in support groups. Assessments occurred at baseline, 2 months, 4 months, 12 months, and 18 months.		
Mauro et al. (2017)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=105 youths and their parents who had been mandated to treatment by a juvenile drug court (JDC).</p> <p>Inclusion Criteria: consent to participate in the study; primarily spoke English</p>	<p>Intervention: N=45. Participants in this group engaged in Risk Reduction Therapy for Adolescents (RRTA). This involved both parent and youth attendance at each session and their collaboration with the therapist in treatment planning.</p> <p>Control: N=60. Participants in this group received treatment as usual. This varied based on the individual but all were JDC-mandated treatment either state or privately funded with very limited parent involvement.</p>	<p>Primary Outcomes: Adolescent substance use. This was measured using youth self-report (timeline follow back methodology) and urine drugs screens (UDS). This was measured 3- and 6-months out from baseline.</p> <p>Secondary Outcomes: Caregiver/adolescent engagement in treatment. This was measured using the Family Engagement Measure (FEM).</p> <p>Treatment participation. This was determined using the number of missed appointments.</p> <p>Family engagement was</p>	<p>RRTA was found to produce a significant positive difference in parent and youth engagement on average across the time points when compared to TAU. However, the low level of response for parents in the TAU intervention might reduce the accuracy of comparison, and the factor of engagement in this group was excluded for subsequent tests (due to lack of data). Parent engagement level was significantly associated with the number of missed appointments. There was not a significant association between high parent engagement in month 2 of treatment and amount of</p>

			measured monthly through the duration of the sessions and participation was calculated at the end of treatment.	substance use. It is stated that there is a significant correlation between parent and youth engagement and substance use at month 3. Two people were excluded from the intervention treatment, but this was not considered significant enough to impact results. No other significant results were reported.
Piehler, T. F., & Winters, K. C. (2017).	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=259. Participants were recruited by school counselors in public school systems in the metro area of the Twin Cities.</p> <p>Inclusion Criteria: Identified by school counselors as students who have been caught using drugs, with drugs in their possession, or due to other drug-related reasons, between ages 13 and 18 years old, have a mild substance abuse problem according to the Personal Experience Screening Questionnaire (PESQ), not be in other treatment program, no risk of suicide, and have a parent/caregiver willing to participate.</p>	<p>Intervention: Brief intervention with adolescent-only (N=136). This group received two 60-minute motivational interviewing sessions. Session 1 focused on revealing information about the adolescents current alcohol and drug use, as well as any related consequences. The session then switched the focus towards the child's motivation to change through evaluating the child's goals and how to avoid triggers. The second session focused on the adolescents progress towards their desired goals and revealing barriers to these goals. The counselor worked with the child to adjust their goals appropriately, create more long term goals, and engaged in exercises to increase skills to resist drug use.</p>	<p>Primary Outcomes: Alcohol and marijuana use. Substance use and dependence was measured using the Adolescent Diagnostic Interview (ADI). The Timeline Followback (TLFB) method was used to measure alcohol and marijuana use within the last 90 days at baseline and 6-month follow-up.</p> <p>Secondary Outcomes: Decision making style. The Social Problem Solving Inventory-Revised-Short Form (SPSI-R:SF) was used to identify the participants decision making style when presented with various situations.</p>	<p>Participants in the BI-AP intervention group demonstrated greater decreases in marijuana and alcohol use when compared to the BI-A group. Those with a more adaptive decision making style demonstrated decreases in marijuana use. Participants with low levels of maladaptive decision making style demonstrated similar outcomes regardless of intervention. Participants with high levels of maladaptive decision making style in the BI-AP intervention group demonstrated greater improvements than the BI-A group.</p>

		<p>Intervention: Brief intervention with additional parent session (N=123). This group received the same 2 motivational interviewing sessions but also participated in a third session that included a parent/caregiver. The caregiver session addressed the following: revealing severity of child's substance use, developing communication amongst family members, identifying the current level of monitoring and adjusting accordingly, and creating support to help the child reach their goals.</p> <p>Control: A control group of 56 students was enlisted in the study but was no additional information regarding the control group was reported in the study.</p>		
Type 3: Virtual interventions				
Author (Year)	Level of Evidence/Study Design/Participants/Inclusion Criteria	Study Groups	Outcome Measures	Results
Andersson, C. et al. (2016)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p>	<p>Intervention: Participants received treatment as usual (substance use outpatient treatment), interactive voice response assessment (IVR),</p>	<p>Primary Outcomes: Symptoms of stress, measured using the Arnetz and Hasson stress questionnaire (AHSS)</p>	<p>The intervention group showed significantly greater improvements in symptoms of stress and anxiety, but there were no significant</p>

	<p>Participants: N= 73</p> <p>Inclusion Criteria: Maximum age of 25 years, seeking treatment at substance use outpatient center Maria Malmo, no severe psychiatric disorder or learning disability, Swedish language speaker, own cell phone</p>	<p>and IVR feedback. IVR uses a preprogrammed script to interact with participants. IVR assessment occurred twice weekly for 3 months and IVR feedback was personalized to reported stress and mental health symptoms.</p> <p>Control: Participants received treatment as usual (substance use outpatient treatment) and IVR assessment, but did not receive IVR feedback. IVR occurred twice weekly for 3 months.</p>	<p>Depression, measured with the Symptoms Checklist 8D (SCL-8D)</p> <p>Anxiety, measured using the Symptoms Checklist-8D (SCL-8D)</p> <p>Secondary Outcomes: Impact of primary outcomes on intensity of alcohol use, measured by participants answering “yes” or “no” when asked if they had used alcohol on the present or preceding day</p> <p>Impact of primary outcomes on intensity of drug use, measured by participants answering “yes” or “no” when asked if they had used drugs on the present or preceding day. If participants answered “yes”, they were asked to specify what kind of drug they used.</p>	<p>changes in depression. While there was a slight improvement in alcohol use and drug use among participants, there were no significant differences between changes in the intervention group and changes in the control group.</p>
Gonzales, R., et al. (2014)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=80</p> <p>Inclusion Criteria: 12 to 25 years old, currently completing treatment for substance abuse, owning a cell</p>	<p>Intervention: Three types of text messages were sent to participants: daily self-monitoring, daily wellness tip, and substance abuse education and social support resources. Data was collected at baseline, once a month during the 12 week program, at discharge, and 90 days after discharge</p>	<p>Primary Outcomes: Relapse, measured using a urine sample and self-reported substance use</p> <p>Secondary Outcomes: Substance use severity, measured by the Global Appraisal Inventory of Needs</p>	<p>Participants in the intervention group were significantly less likely to relapse compared to the aftercare as usual group ($p=.002$). Participants in the intervention group showed significant reductions in substance use severity over time, while the aftercare as usual group showed an</p>

	<p>phone with Short Message Service (SMS) texting capabilities, willing to comply to study procedures, and able to provide caregiver consent if under 18 years old</p>	<p>Aftercare as usual: Community based treatment programs from which participants were recruited in the control group to 12-step programs. Data was collected at baseline, once a month during the 12 week program, at discharge, and 90 days after discharge</p>	<p>(GAIN) past month substance severity scale</p> <p>Recovery behaviors, measured using subscales from the Brief Addiction Monitor (BAM). The subscales used were: Number of days in the past month that participant reported engaging in extracurricular recovery activities and participation in self-help/12-step meetings</p>	<p>increase in severity. Participation in self-help meetings significantly decreased among participants in both groups over the course of the study ($p < .001$). At discharge, participants in the intervention group had significant higher participation in 12-step meetings than aftercare as usual participants, but this disappears at 90 day followup. There was a significant increase in participation in extracurricular activities among participants in the intervention group compared to the aftercare as usual group, and the intervention group was significantly more likely to participate in extracurricular activities compared to the aftercare as usual group at discharge and 90 day follow-up.</p>
Haug, S. et al. (2017)	<p>Level of Evidence: III</p> <p>Study Design: Cohort</p> <p>Participants: N=877</p> <p>Inclusion Criteria: At least 16 years old, enrolled in vocational school, own a mobile phone</p>	<p>Intervention: Participants received between 2 and 4 text messages per week for 24 weeks focusing on self-management skills, social skills, and substance use refusal skills. The messages were individually tailored according to each participant's baseline data.</p>	<p>Primary Outcomes:</p> <p>Life skills:</p> <p>Stress, measured using a 4-item version of the PSS.</p> <p>Self-management skills, measured using the Questionnaire for the Measurement of Stress and Coping in Children and</p>	<p>There was a statistically significant decrease in perceived stress and significant increase in the self-management skills <i>seeking social support and palliative emotion regulation</i> and for social skills. There was a statistically significant decrease in the number of participants with at-risk</p>

			<p>Adolescents</p> <p>Social skills, measured using the Assertion Inventory</p> <p>Substance use:</p> <p>At-risk alcohol use, measured using the Alcohol Use Disorder Identification Test (AUDIT)</p> <p>Tobacco smoking, assessed using the question “have you taken at least one puff of a cigarette within the past 30 days?”</p> <p>Cannabis use, assessed with the question “Within the last 6 months, how often did you use cannabis or marijuana?” and answer options 1.) “never”, 2.) “1-5 times”, 3.) “6-20 times”, 4.) “more often than 20 times”</p>	<p>alcohol use, but there were no significant changes in cannabis or tobacco use.</p>
Hopkins, J. et al. (2015)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Control Trial</p> <p>Participants: N=236</p> <p>Inclusion Criteria: Sexual minority youth (LGBTQ+) ages 15-16 on Facebook</p>	<p>Intervention: N=119. Three session online intervention focused on skills for identifying and managing stress, five-step guide for making decisions and drug use rates and refusal skills.</p> <p>Control: N=117. The control group completed the pre, post and follow-up test and did not participate in any type of intervention.</p>	<p>Primary Outcomes: Substance use.</p> <p>Secondary Outcomes: Perceived stress, coping skills, problem-solving skills, drug refusal skills, peer drug use, 30-day alcohol use, cigarette use, marijuana use and other drug use.</p>	<p>Small effect sizes were found for all areas of measurement. This study found that the individuals who participated reported less stress, past 30 day drug use, and peer drug use. These participants also reported higher coping and problem solving skills as well as drug-use refusal skills.</p>

Trudeau et al. (2017)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=129 adolescents in substance abuse treatment at an outpatient facility in California</p> <p>Inclusion Criteria: currently meeting with a counselor in the study at least twice per month; between the ages of 13 and 21; able to read and speak English; have drugs and/or alcohol as their primary or secondary substance used; have completed detox as necessary.</p>	<p>Intervention: N=49. Participated in a minimum of 12 online lessons over 3 months with additional engagement opportunities at the discretion of the participant. Also participated in TAU.</p> <p>Control: N=80. Participated in TAU and were encouraged to read a new online article about substance use each week.</p>	<p>Primary Outcomes: Substance use. Measured using the Drug Use and Alcohol Use scales from the Comprehensive Health Assessment for Teens (CHAT). Motivation to change. Measured using the University of Rhode Island Change Assessment Questionnaire (URICA). Relapse coping skills. Measured using the Adolescent Relapse Coping Questionnaire. Self-efficacy. Measured using the Drug Avoidance Self-Efficacy Scale (DASES). Secondary Outcomes: Therapeutic alliance. Measured using the Working Alliance Inventory-Short form (WAI-S). User Engagement. Measured by compiling data from the online program. Participant Satisfaction. Measured by a survey developed by the authors. Outcomes were measured pre-intervention, post-intervention, and 3- and 6-months post-intervention.</p>	<p>Substance use (excluding alcohol) was found to be significantly lower at the 3-month follow-up in the intervention group than the control group, but was not significant post-intervention or at the 6-month follow-up. Motivation to change was significantly higher in the intervention group at the 3- and 6-month follow-ups. No significant effects were found for relapse coping skills, self-efficacy, or any of the secondary outcomes.</p>
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Walton, M. A. et al (2013)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=328</p> <p>Inclusion Criteria: 12-18 years old, self-report of past year cannabis use, presenting to a federally-qualified health clinic</p>	<p>Intervention:</p> <p>Computer Brief Intervention(CBI): N=100; Participants used an interactive computer program that utilized decisional balance and role-play exercises. Data was collected at baseline, 3 months, 6 months, and 12 months.</p> <p>Therapist Brief Intervention (TBI):N= 118; Therapists were trained in Motivational Interviewing (MI) and then provided brief intervention (BI) by using open-ended questions and role play exercises to encourage change talk.Data was collected at baseline, 3 months, 6 months, and 12 months.</p> <p>Control: N=110; Participants received a brochure containing warning signs of cannabis problems, resources, and cannabis information websites.</p>	<p>Primary Outcomes: Cannabis use: Measured using Add Health item: Cannabis</p> <p>Cannabis-related consequences: Measured using 23 items from the Rutgers Alcohol Problems Index and 5 items from the Severity of Dependence Scale</p> <p>Secondary Outcomes: Alcohol use: Measured using a question from the Alcohol Use Disorder Test</p> <p>Other drug use (illicit and non-medical prescription drugs): Measured using Add Health items: inhalants, cocaine, heroin, other hallucinogens, non-medical use of painkillers/opioids, stimulants, and sedatives</p> <p>Driving under the influence of cannabis: Measured using rating scale of “never”, “1-2 times”, “3-5 times”, “6-9 times”, and “10 or more times” for driving under the influence of cannabis in the past 3 months</p>	<p>There was a significant decrease in cannabis use among all three groups at all follow up points. There was a significant decrease in cannabis consequences in the CBI condition at 3 and 6 months, and in the TBI condition at 6 and 12 months. There were no significant decreases in cannabis consequences in the control group. There were no significant decreases in alcohol use in any condition. There was a significant decrease in driving under the influence of cannabis in the TBI condition at 3 months, but not at any other follow-up point. There were no significant changes for DUI in the CBI or control condition. There was a significant decrease in the frequency of other drug use in the CBI and TBI conditions at 3 and 6 months, but no significant change was found at 12 months</p>
Type 4: 12-step programs				
Author (Year)	Level of Evidence/Study Design/Participants/Inclusion Criteria	Study Groups	Outcome Measures	Results

<p>Kelly, J. F. et al. (2012) (three)</p>	<p>Level of Evidence: III</p> <p>Study Design: Cohort</p> <p>Participants: N=127</p> <p>Inclusion Criteria: Participants had to be in their first month of treatment, be between the ages of 14 and 29, have parental consent and speak English.</p>	<p>Intervention: Participants in this study took part in abstinence focused treatment based on a combination of CBT, MET and 12-step models. Most participants at the facility included an initial assessment, attendance at 12 weekly or biweekly 60-minute group treatment sessions and reassessments following the 12 weeks of treatment.</p>	<p>Primary Outcomes: Meeting attendance, Active 12-Step Involvement, Recent Substance use and Prior Treatment, Abstinence Goal, Abstinence Self-Efficacy, and Biological Verification of Self-Report</p> <p>Secondary Outcomes: Bivariate relationships. Strong correlations were found between program attendance and involvement. Some findings showed that this relationship had correlation with PDA.</p> <p>Influence of 12-step attendance and involvement over time.</p> <p>Incremental effects of individual aspects of 12-step involvement on outcomes over time.</p>	<p>The results showed that 12-step attendance and involvement were strongly correlated with one another at all follow-ups with and outcomes related to percentage of days abstinent (PDA).</p>
<p>Kelly, J. F. et al. (2016) (two)</p>	<p>Level of Evidence: III</p> <p>Study Design: Cohort</p> <p>Participants: N=36</p> <p>Inclusion Criteria: Adolescents seeking SUD treatment who were between the ages of 14 and 19, have parental consent, meet the DSM-IV criteria for drug and alcohol abuse or dependence</p>	<p>Intervention: A ten session combination of MET individual therapy (2) and group therapy which utilizes methods from TSF and CBT(8).</p>	<p>Primary Outcomes: Perceptions of Treatment, Treatment Satisfaction, 12-Step Meeting Attendance, Percent Days Abstinent, and Substance Use and Mental Health Diagnoses</p>	<p>The results show that an intervention such as this can reduce substance use.</p> <p>1)Treatment Satisfaction- At the 3-month follow-up assessment participants reported a mean of 4.29 (out of 5) showing that there were high levels of satisfaction with the treatment experience. 2)12-Step Attendance and Abstinence- Overall, participants abstinent</p>

	and be able to speak and understand English.			<p>days increased significantly from baseline to the three month follow-up ($p=0.03$). There was a significant positive correlation between 12-step attendance during treatment and percent of days abstinent (PDA) at the 3-month follow-up (when looking at the total number of meetings $p<0.05$ and non-inpatient meetings $p<0.05$). Participants who attended more meetings had more abstinent days. 3)Participants' Reactions to 12-step in-services- Participants who took part in Marijuana Anonymous (MA) on average rated their reaction a 3.96 (out of 5) those in Narcotics Anonymous (NA) on average rated their reaction 4.04 (out of 5). They rated the in-services as most helpful and AA in-services the least helpful. 80% of the participants said that AA in-service was not helpful. 4)Drug Test Results- Saliva tests were taken at the 3 month follow-up but were mainly used to encourage accurate self-reporting from participants.</p>
Kelly, J. F. et al. (2017) (one)	<p>Level of Evidence: I</p> <p>Study Design: Randomized</p>	<p>Intervention: Integrated Twelve-Step Facilitation Treatment</p>	<p>Primary Outcomes: Group interaction effects were not significantly related to</p>	<p>Associations were found between more attendance and longer periods of abstinence</p>

	<p>Control Trial</p> <p>Participants: N=59</p> <p>Inclusion Criteria: Individuals between 14-21, consenting legal guardian, meet DSM-IV criteria for drug/alcohol abuse and/or dependence, have used alcohol or drugs in the past 90 days, meet placement criteria (low intensity outpatient care), provide necessary contact information and speak/understand English.</p>	<p>Control: Motivational Enhancement Therapy/Cognitive Behavioral Therapy</p>	<p>PDA.</p> <p>Secondary Outcomes: 12-step attendance and the number of meetings participants went to showed no significant effects.</p>	<p>at 3, 6, and 9 months. 3 months, $p=.008$, 6 months, $p=.049$, 9 months, $p=.63$. For substance related consequences researchers found that participants who were randomized to the iTSF group reported fewer substance use problems during treatment and at follow-up.</p>
Type 5: CBT and/or Motivational Interviewing				
Author (Year)	Level of Evidence/Study Design/Participants/Inclusion Criteria	Study Groups	Outcome Measures	Results
Brown, R. A. et al. (2015)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=151</p> <p>Intervention (MI) group: 79 Control (TAU) group: 72</p> <p>Groups were very similar in terms of the number that were female (MI mean =46, TAU mean=52), age (MI mean=15.85, TAU mean age</p>	<p>Intervention: two 45-minute Motivational Interviewing (MI) sessions in combination with the treatment as usual given from the hospital, MI sessions delivered by trained doctoral level clinical psychologists, and psychology and post-doctoral fellows from Alpert Medical school. The sessions focused on allowing the adolescents to evaluate their substance use behaviors, become more aware of the</p>	<p>Primary Outcomes: All participants were assessed using the Timeline Followback interview (TLFB) (Sobell & Sobell, 1996) at baseline, and follow-ups in person (months 1, 6, 12) and over the phone (months 3 and 9), to collect information about daily alcohol, marijuana, and drug use. The researchers re-calculated their results to exclude days in which the participants were in the treatment facility, where drug</p>	<p>The MI treatment group had a significantly longer delay between their time to use a substance after discharge from the hospital ($p=0.008$), had reductions in their total use of a substances during the 6 months after discharge ($p=.047$), and reported less rule-breaking after discharge. However, all of these results were negligible after 6 months, and no significant findings were found during the follow-ups over months</p>

	<p>=15.85), the number of participants who were white (MI mean =66 TAU mean=64), and the number of participants who were Hispanic (MI mean= 6, and TAU mean =4).</p> <p>At the 6th month follow-up, MI group (n=50) and TAU group (n=50)</p> <p>12-month follow-up participants were gained, MI group (n=59) and TAU group (n=58).</p> <p>Intention to treat analysis was <u>not</u> performed as only 139 participants were included in the data analyses.</p> <p>No significant differences were reported between the 2 groups at baseline.</p> <p>Inclusion Criteria: All adolescents were between 13-17 years old, had access to a telephone, had a non-nicotine substance use disorder in the year prior, and had an Axis 1 psychiatric disorder, and were enrolled, in an adolescent inpatient unit at Butler Hospital or Bradley Hospital, in Providence Rhode Island</p>	<p>personal consequences of their substance use, and make personal goals to reduce their substance use.</p> <p>Control: treatment as usual (TAU) from the hospital included pharmacotherapy, individual and family sessions, and psychoeducational group sessions, delivered by a designated hospital psychiatrist and a variety of healthcare specialists.</p>	<p>use was prohibited, to prevent a skewness of the data.</p> <p>All participants had to provide a urine sample at follow-up for months 1, 6, and 12 to test for drugs and compare to self-reports.</p> <p>Secondary Outcomes: The Adolescent Problem Use Scale was also given at baseline and all follow-ups, in person (months 1, 6, 12) and over the phone (months 3 and 9), to look at the social, health, and legal effects of substance use.</p> <p>The Youth Self Report (YSR) (Achenbach & Rescorla, 2001), was given to look at psychiatric symptoms and negative behaviors, at baseline and follow-up at months 6 and 12.</p>	<p>seven to twelve after hospital discharge. Clinical significance was not reported.</p>
Fortuna, L. R. et al.	Level of Evidence: III	Intervention: All	Primary Outcomes:	No significant improvements

(2018)	<p>Study Design: One-group, nonrandomized (before, after)</p> <p>Participants: Intervention group before study: n= 37 Girls n=27; Boys n= 10; Latino n=14; White/other n=23; US born n=27 Foreign born n=10 Mean age (SD)=16.76 (1.30) Age range= 14-20 Alcohol use n =24 Cannabis use n=30 Physical abuse/assault n=14 Sexual abuse/assault n=11</p> <p>After study: N=23 participants end of the study Girls n=16; Boys n=7; Latino n=11; White/other n=12 US born n=16; Foreign born n=7; Mean age (SD)= 16.68 (1.43) Age range= 14-20 Alcohol use n=13 Cannabis use n=18 Physical abuse/assault n=11 Sexual abuse/assault n=6</p> <p>30% of n=23 took prescribed medications before beginning the study (8-20 weeks prior), 90% prescribed Serotonin Specific Reuptake Inhibitor or bupropion, 20% were on stimulants for comorbid ADHD, 55% received past</p>	<p>participants received the MBCT-dual manualized therapy for 12 weeks, which is a combination of CBT and mindfulness therapy. The intervention involved weekly therapy sessions that were 50-60 minutes long for a duration of 12 weeks, along with a manual and worksheets for the participants to fill out as they progressed through treatment. The therapy focused on reducing substance use and mental health symptoms through the use of psycho-education, relaxation, and breathing training through the use of meditation, mindfulness training for recognizing one's internal thoughts and feelings, and training for noticing PTSD triggers, and reframing for one's negative thoughts. Participants who attended less than 6 therapy sessions (6 weeks) were identified as drop-outs and no follow-up intervals occurred for any of the participants. The therapy sessions, manuals, and worksheets were done in either English or Spanish. The intervention was adapted to be done in Spanish based on focus groups and</p>	<p>To measure the change in substance, use from baseline to end of treatment, the Time-Line Follow-Back was used.</p> <p>To measure the change in depressive symptoms, from baseline to end of treatment, the Beck Depression Inventory was used.</p> <p>The Child PTSD Symptom Scale (CPSS) was given at baseline, and end of treatment, to monitor change in PTSD symptoms and symptom severity.</p> <p>The Posttraumatic Cognitions Inventory was used, to measure differences in trauma related thoughts and feelings from baseline to the end of the study.</p> <p>The Teen Addiction Severity Index was used to assess the severity of one's substance use, at baseline and the end of the study.</p>	<p>were seen in a reduction on the severity of one's substance use, but there was a significant reduction in cannabis use. Statistically, significant and medium to large clinical effects were seen with improvements in PTSD symptoms, a decrease in the severity of PTSD impairments, a decrease of trauma-related cognitions, and a decrease in depressive symptoms.</p> <p>However the efficacy of these findings is limited, due to the small sample size of the study, lack of intention to treat analysis, lack of a control group from which to compare these results, and lack of follow-up assessments.</p>
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	<p>psychiatric or substance use care in an outpatient or inpatient unit.</p> <p>No significant differences were reported between the Baseline participant (n=37) and those who completed the intervention (N=23), on gender, age, nativity, substance use, or trauma history.</p> <p>Inclusion Criteria: All had a PTSD diagnosis, and reported current substance and use or moderate substance use in last 3-6 months, and reported risk for relapse. All were recruited from an urban community mental health clinic, or from 2 health centers for high school students, and both the adolescents and their parents consented to join.</p>	<p>individualized interviews from 10 adolescents who provided feedback before the intervention began. Three clinicians, and a bilingual Spanish-speaking adolescent psychiatrist delivered the intervention. The Spanish-speaking psychiatrist and one of the clinicians administered the intervention in Spanish to 11 participants, and they received extra training, and supervision for treatment adherence.</p> <p>Control: n/a</p>		
Korchmaros, J. D. (2018).	<p>Level of Evidence: III</p> <p>Study Design: Cohort Study</p> <p>Participants: N= 392 Participants were referred from seven different adolescent substance programs including both urban and rural areas within the United States.</p> <p>Inclusion Criteria: Between ages 13 and 17 years old,</p>	<p>Intervention: The Seven Challenges intervention follows an individualized approach to treating adolescent substance use with its focus on self-evaluation and decision making. The seven challenges include: 1) relationship development with the counselor, 2) considering why they participate in alcohol and</p>	<p>Primary Outcomes: Frequency of substance use. This was measured using Global Appraisal of Individual Needs (GAIN) and its subscales. GAIN is a standardized biopsychosocial assessment based on self-report and is used for adolescents or adults with substance use challenges.</p> <p>Secondary Outcomes:</p>	<p>Results concluded the intervention to be effective in reducing substance use, mental-health related issues, and criminal actions. All p-values reported demonstrate significant differences (p<.001) in results from pre- to post-intervention and effect size was reported to be small to moderately sized in all categories of results.</p>

	<p>diagnosed substance use disorder based on the American Society of Addiction Medicine, and were charged with a nonviolent offense.</p>	<p>other drug use, 3) identifying harmful consequences related to their alcohol or drug use 4) taking into consideration their own role, as well as the role of others in their problems, 5) identifying where they want to be long term and how their current lifestyle may be not provide an avenue for them to reach their goals 6) decision-making in regards to their life and drug use 7) monitoring progress, learning from mistakes, and identifying progress.</p>	<p>Number of crimes committed, severity of substance use problem, frequency of substance use issues, substance use disorders, mental health challenges, and health-promoting behaviors were also measured using the GAIN and its subsets.</p>	
2	<p>Level of Evidence: I</p> <p>Study Design: Randomized Control Trial</p> <p>Participants: N=119</p> <p>Inclusion Criteria: Individuals between the ages of 14-18 who presented at an outpatient adolescent clinic who have not been diagnosed with substance use disorder.</p>	<p>Intervention: 20 minute intervention known as Peer Network Counseling. The 20 minute intervention was separated in four, 5-minute sections. 1)Rapport building and laptop presentation of substance use feedback, 2)discussion of substance use likes/dislikes and discrepancies, 3)introduction of peer network information and graphical feedback and 4)summary and talking through plans. This was all done verbally and with the use of a laptop.</p> <p>Control: The control group reviewed an informational handout with a therapist and</p>	<p>This study looked at alcohol and marijuana use, alcohol use intentions and offers over a 6 month period. This study also looked at gender effects on substance use and peer networks characteristics.</p>	<p>The alcohol model (for males) had a p value of .08. Girls on the other hand showed a p value of 0.24 which has very weak significance. Under gender effects on substance use figures show a decline among boys in the intervention condition but no significant outcome for girls in the intervention group. The intervention worked best for individuals with a protective peer network. The results were reported for each outcome in each study group at every interval.</p>

		discussed topics such as life skills, exercise, etc. This session was also 20 minutes long.		
Spirito, A. et al. (2018)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=69 adolescents, N=69 parents</p> <p>Intervention group: motivational enhancement therapy (MET) in combination with Family Check -up (FCU) group n=34 teens, n=34 parents Teens in MET/FCU mean age (SD): 15.7 (1.4) Female (41.2%) White (66.7%) Parent mean age (SD): 41.3 (8.0) Female: (88.2%) White (73.9%)</p> <p>Comparison group: psychoeducation (PE) group n=35 teens, n=35 parents Teens in PE group mean age (SD): 16.0 (1.2) Female (37.1%) White (51.4%) Parent mean age (SD): 43.1 (8.6) Female (94.3%) White</p>	<p>Intervention: participants completed a 45-minute assessment session. After that, for 90 minutes the adolescents completed an MET session while the parents completed an FCU session at the same time. In the MET session, the teens were in charge of the session and given the power to create their own goals and develop their own reasoning/motivation to change their substance use behaviors. In the FCU session, parents received feedback on the results of a pre-recorded video of them with their teen, discussed their motivations to come to therapy, strengths and weaknesses they displayed in the video, and brainstormed future steps to help their teen moving forward. This was delivered by therapists. (1 Ph.D. in developmental psychology; 4 master's degrees in social work or mental health counseling), who were trained through the use of an MI workshop, individualized instruction on</p>	<p>Primary Outcomes: Marijuana use (quantity and frequency), was assessed using Timeline Follow-Back (Sobell & Sobell, 1996)</p> <p>Alcohol use (frequency, quantity, number of high volume drinking days) was assessed using The Adolescent Drinking Questionnaire (ADQ; Jessor, Donovan, & Costa, 1989)</p> <p>Truancy was assessed using the Timeline Follow-Back (Sobell & Sobell, 1996),</p> <p>Drug use was assessed using, a urine drug screen (UDS; Redwood Toxicology) at the end of the study, and through self-reports of more than 9 drugs in the prior year</p> <p>Secondary Outcomes: The Videotaped Family Assessment Task (FAsTask), given at baseline and at six month follow-up, to look at parent-teen interactions while discuss family topics</p> <p>4 items on Session Evaluation</p>	<p>The most significant results found the intervention group had a medium treatment effect size when analyzing the number of days MJ was used (d=0.49) and the number of times it was used per day (d= 0.53). Other results found small to medium treatment effect sizes when looking at the percentage of days MJ was used over a 90-day period, the amount any other drug was used over the time span of a year, and the number of days 5 or more drinks were consumed. Lastly, only a small treatment effect size was found when analyzing the results of frequent alcohol use, and when analyzing truancy. Overall, more favorable outcomes were found for MET/FCU group when looking at lower rates of marijuana (MJ) use, drug use, and truancy when compared to the PE condition, but both groups did find a reduction in substance use and truancy.</p>

	<p>(45.7%)</p> <p>No statistically significant differences were reported between groups.</p> <p>Inclusion criteria: All adolescents lived with a parent or legal guardian at home in a suburban/urban area, lived in the Northeast U.S, were between 13-18 years old, and reported using marijuana a minimum of 3 times in the past 90 days. All had a history of being in a truancy court or had a minimum of 10 skipped classes or unexcused absences/tardies in the prior year.</p>	<p>MET/FCU from specialists, and through practice role play.</p> <p>Comparison: In the PE group, participants similarly completed the same 45-minute assessment. Following that, for 60 minutes the adolescents and parents completed PE sessions that occurred at the same time but separately, where information about the effects, risks, and myths surrounding marijuana and alcohol use were discussed and educational handouts were provided. This was delivered by the same counselors who delivered the MET/FCU intervention, (1 Ph.D. in developmental psychology; 4 master's degrees in social work or mental health counseling), they received extra training to ensure there was no cross-over of MI, through role-playing, and a review of PE materials.</p> <p>Both had 3-month follow-up sessions, where they received 30- minute booster sessions of their specific intervention (with high retention rate for both groups, at 94%)</p>	<p>Forms (SEF; Harper, Contreras, Bangi, & Pedraza, 2003) were assessed on Likert scale, to gauge degree of helpfulness/relevance of the interventions</p>	
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<p>Stein, L. A. R. et al. (2011)</p>	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N=162 Intervention group: n=# not given Control Group: n= # not given 31.5% Hispanic, 30.3% African American, 29.6% White, and 8.6% other. 84% male, 59.9% qualified for alcohol use disorder 88.9% qualified for marijuana use disorder</p>	<p>Intervention: Motivational Interviewing (MI), where the research counselors focused on using empathy and personal feedback to help the adolescents develop self-efficacy and motivation to make personalized goals in relation to reducing their alcohol/ marijuana use, and the risky behaviors and consequences that can accompany them, delivered by 4 research counselors, (1= master's degree, 3=bachelor's degree). They</p>	<p>Primary Outcomes: The TLFB -Timeline Followback, was conducted at baseline and follow-up, to note one's amount of alcohol and marijuana use.</p> <p>At baseline, all participants were given a structured clinical interview for DSM-IV for alcohol and marijuana abuse and dependence, and were given the Center for Epidemiological Studies-Depression (CES-D) scale).</p>	<p>Statistically significant effects were seen when looking at reducing the average number of drinks per day, with a small effect size when looking at % of heavy drinking days) with a small effect size, and % of days when >5 drinks were had with a small-medium effect size. It was also found that a statically significant number of adolescents in the MI intervention with lower levels of depression reported having fewer drinks, when compared</p>

	<p>89.5% enrolled in the facility standard care substance use program after being given the baseline treatment, $M_{age}=17.10$ ($SD=1.11$)</p> <p>No significant differences were found between those who completed their intervention and those who dropped out, actual demographic statistics were not reported with specific data for each intervention group, only reported that more white participants dropped out ($p<0.023$).</p> <p>Inclusion Criteria: Participants were recruited from a U.S Northeastern state juvenile facility between April 2001-March 2006, all between the ages of 14-19 years old, sentenced to be in the facility for 4-12 months. All participants had used marijuana or drank at least monthly in the year prior to their incarceration, or drank heavily at least 1 time, in the year prior to their incarceration (5 or more drinks= males, 4 or more= females), or in 4 weeks before their offense that caused their incarceration or before their actual incarceration, they used marijuana or drank.</p>	<p>received 56 hours of manualized training, had 2 hours of group supervision per week, 1 hour of individual supervision per week, and were observed by a licensed clinical psychologist. The data they collected was reviewed (by either licensed clinical psychologist/master's-level project member).</p> <p>Control: Relaxation training (RT), delivered by the same research counselors who delivered the MI intervention with the same requirements. The research counselors instructed the adolescents through guided imagery using 5 senses, gave broad advice to help reduce alcohol and marijuana use, and gave instructions and handouts on progressive muscle relaxation, as a means to reduce stress and indirectly reduce self-medicating behavior</p>	<p>Record Review at baseline, done to compare, self-reported alcohol/marijuana use, and illegal activity, against records</p>	<p>to the RT group, with a medium effect size.</p>
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	All participants or their guardians consented to involvement.			
D'Amico et al. (2020).	<p>Level of Evidence: I</p> <p>Study Design: Randomized Control Trial</p> <p>Participants: N= 294. Participants were recruited for the study from 4 different primary care clinics that provide services for ethnically and racially diverse adolescents in the Los Angeles and Pittsburgh area.</p> <p>Inclusion Criteria: English speaking, ages 12-18 years old, and attended an appointment at one of the 4 primary care clinics in Los Angeles and Pittsburgh that were recruited for the study.</p>	<p>Intervention: CHAT motivational interviewing (MI) was delivered in a 15-20 minute brief intervention to assess assesses motivation for change, and discussed whether or not teens were eager to make changes, as well as provide normative data regarding alcohol and other drug use.</p> <p>Control: Participants in the control group (N=141) were provided usual care in the primary care visits.</p>	<p>Primary Outcomes: Alcohol and marijuana use. The article specified “well-established measures” were used to determine alcohol and marijuana use through questions on a 6-point frequency response scale (0= never, 5= more than 20 times).</p> <p>Secondary Outcomes: Heavy drinking, negative outcomes from drinking, negative outcomes from using marijuana, perceived peer use of alcohol and marijuana, and time spent with others who participate in alcohol and marijuana related activities, as well as resistance self-efficacy (RSE). Negative outcomes associated with alcohol and marijuana use were measured using what the study described as “well-established measures for adolescents”. This consisted of a rating scale to gauge negative consequences experienced from drinking or smoking. Influence of peers was measured with a similar rating scale. Resistance self-efficacy was measured using a 4 item rating scale to determine how likely the individual was to</p>	Individuals in the CHAT group who reported more alcohol related consequences and with alcohol use disorders demonstrated a decrease in alcohol use and alcohol-related consequences at the 1-year follow-up. At baseline, those with more consequences related to marijuana demonstrated less marijuana use 1 year later when compared to those receiving usual care. These results suggest that individuals with increased consequences related to alcohol and drug use may benefit more from the CHAT long term or 1 year later.

			participate in the described scenarios.	
Type 6: School and Community-Based Interventions				
Author (Year)	Level of Evidence/Study Design/Participants/Inclusion Criteria	Study Groups	Outcome Measures	Results
Trujillo et al. (2019)	<p>Level of Evidence: II</p> <p>Study Design: Case-Control</p> <p>Participants: N = 31 (adolescents aged 12-17) Intervention group n =14 Control group n =17</p> <p>Inclusion Criteria: Ages 12-17, ability to provide written and informed parental assent, DSM-V diagnosis of at least one SUD, willingness to participate</p>	<p>Intervention: School-based mental health and substance treatment with licensed clinical social worker and certified addictions counselor plus animal assisted therapy (AAT) with a certified therapy dog</p> <p>Control: School-based mental health and substance treatment with licensed clinical social worker and certified addictions counselor</p>	<p>Treatment participation (# of sessions attended)</p> <p>Proportion of negative urine drug screen tests</p> <p>Overall well-being (Outcome Rating Score)</p> <p>School engagement (School Engagement Instrument)</p>	<p>Participants in intervention group had increase in number of sessions attended and change in overall well-being (statistically significant)</p> <p>Intervention group had school engagement scores more than double of control group (not statistically significant)</p> <p>Intervention group had larger improvement in overall well being scores compared to control group (not statistically significant)</p>
Kristjansson et al. (2010)	<p>Level of Evidence: II</p> <p>Study Design: Case-Control</p> <p>Participants: N = 5024 (adolescents aged 14-15) Intervention group n = 3117 Control group n = 1907</p> <p>Inclusion Criteria: 9th and 10th graders (ages 14-15), living in towns and villages</p>	<p>Intervention: Participation in the Icelandic Centre for Social Research and Analysis (ICRSA) community-based substance use prevention programs</p> <p>Control: No participation in ICRSA programs</p>	<p>Alcohol use in last 30 days</p> <p>Alcohol intoxication during the last 30 days</p> <p>Daily smoking</p> <p>Going to parties</p>	<p>Greater reductions in alcohol use and alcohol intoxication in intervention group than in control group (statistically significant)</p> <p>Greater reduction in daily smoking in intervention group as compared to control group (not statistically significant)</p>

	outside capital area in Iceland			Decrease in going to parties in intervention group (statistically significant)
Maalouf et al. (2019)	<p>Level of Evidence: II</p> <p>Study Design: Case-Control</p> <p>Participants: N = 5196 (students aged 11 to >14) Intervention group n = 2964 Control group n = 2232</p> <p>Inclusion Criteria: Students in Serbia, Macedonia, and Montenegro aged 11 to >14</p>	<p>Intervention: Participation in Lions Quest Skills for Adolescence (LQSFA) school-based prevention intervention that focuses on teaching skills to build resilience against drug and alcohol use</p> <p>Control: Regular school curriculum</p>	<p>Substance use (including alcohol, cigarettes, or marijuana) in the last 30 days</p> <p>Intention to use in the next 3 months</p>	<p>Larger relative increase in reported alcohol consumption, cigarette smoking, and smoking marijuana in the last 30 days in control group as compared with intervention group (not statistically significant)</p> <p>Higher prevalence of substance use in last 30 days in control group as compared with intervention group (statistically significant for marijuana smoking in 1 country and cigarette smoking in 1 other country)</p> <p>Intention to use in next 3 months higher in control group as compared with intervention group (statistically significant for marijuana in 1 country and cigarette smoking in 1 other country)</p>
Bettmann et al. (2012)	<p>Level of Evidence: III</p> <p>Study Design: Case-Control</p> <p>Participants: N = 41 (adolescents with substance use disorders participating in a wilderness therapy (WT))</p>	<p>Intervention: Participation in an 8-week wilderness therapy program</p> <p>Control: No control group was utilized due to high cost and lack of a waiting list</p>	<p>Overall adolescent well-being: subscales included interpersonal distress, somatic, interpersonal relations, critical items, social problems, and behavioral dysfunction (measured by Y-OQ scores)</p>	<p>Improvement in each subscale of Y-OQ assessment after intervention (clinically and statistically significant)</p> <p>Participants maintained positive treatment outcomes across all Y-OQ domains</p>

	<p>program)</p> <p>Inclusion Criteria: Adolescents with SUD participating in WT program, consenting to participate in outcome monitoring, completing pretreatment Youth Outcome Questionnaire (Y-OQ) assessment, agreeing to participate in post-treatment and follow-up assessments</p>			<p>with continued improvement at 6 months post-treatment (statistically significant)</p>
Butzer et al. (2017)	<p>Level of Evidence: I</p> <p>Study Design: Randomized Controlled Trial</p> <p>Participants: N = 209 (7th grade students at an urban public school) Intervention n = 116 Control n = 93</p> <p>Inclusion Criteria: 7th grade students at an urban public school in Boston</p>	<p>Intervention: Yoga intervention during physical education classes</p> <p>Control: Normal physical education</p>	<p>Stress (Perceived Stress Scale)</p> <p>Impulsivity (UPPS-P Impulsive Behavior Scale)</p> <p>Emotional self-regulation (self-report scales)</p> <p>Substance use willingness (Youth Risk Behavior Survey)</p> <p>Lifetime substance use and frequency (YBRS-MS)</p>	<p>Greater willingness to smoke cigarettes in control group than in intervention group post-treatment (statistically significant)</p> <p>Greater increases in emotional self-control for females in intervention group as compared with males in intervention group and both males and females in both groups (statistically significant)</p>