



CONNECTIONS BETWEEN COGNITION AND BEHAVIORAL HEALTH IN SUBSTANCE ABUSE PREVENTION AND TREATMENT:

Effective Multidimensional Interventions, including
Cognitive-Behavioral Therapy (CBT), Motivational
Interviewing (MI), and Contingency Management
(CM)

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INTRODUCTION

Substance abuse is a significant issue for adolescents with potentially serious social, physical, emotional consequences that come from use and/or misuse. Stanger et al (2009) reported that marijuana is still the most widely abused illicit substance for adolescents, with a number of serious risks, including “delinquency, school failure, physical and psychological problems, and selling illegal drugs” (p. 2). Schinke et al (2008) noted that underage drinking among young women is steadily increasing, “with girls’ rates of heavy drinking growing faster than boys’ rates” (Schinke et al, 2008, p. 70). McHugh (2010) found that substance abuse disorders (SUD) are quite common, with “lifetime rates of over 30% for alcohol use and over 10% for other drugs” (p. 1). In addition, prescription opioid use and misuse is reaching epidemic proportions, with nearly one-third of all Americans receiving treatment for chronic pain (Garland et al, 2014).

In previous research reviews completed by the Prospectus Group, we have described population-level programs, policies, and projects designed to target the physical, social, and cultural environment in which substance use and misuse may occur. For example, we have completed research reviews on the following critical substance abuse topics: prescription drugs, underage drinking, the effective use of media campaigns, building community awareness, and the social-ecological framework. All of these research reviews affirmed the importance of large-scale, population level efforts that attempt to “move the needle” on critical substance abuse challenges facing the United States.

At the same time, the field of substance abuse prevention has begun to incorporate principles from behavioral health (conceptualized here as *the study of emotions, behaviors, and biology relating to a person’s mental well-being, their ability to function in everyday life, and their concept of self*). This focus on interventions driven by the individual’s ability to affect change over their substance use acknowledges that substance use is influenced by contextual factors that include the environment, as well as individual level decisions, practices, and competencies. In recent years has worked to individual-level interventions designed to increase protective factors that have been shown to reduce substance use among adolescents (Karki, 2012, p. 384). Research has suggested that a wide variety of interventions may lead to reductions in adolescent substance use/misuse aimed, including:

- 1) those that increase “social and emotional competence skills in adolescents,”
- 2) those that take into account the psychological reasons for substance use (e.g., those that involve cognitive-behavioral therapy, and/or motivational enhancement therapy), and
- 3) those that aim to improve interpersonal dynamics (e.g., family-based interventions) (Karki, 2012, p. 384).

This research review aims to supplement previous reviews we have done by focusing on individual and interpersonal-level interventions that represent emerging strategies to tackle adolescent substance abuse. Previous research has suggested the interdependence of family, community, school, and social

domains in substance use, and these interventions aim to increase the social, emotional, and cognitive skills and competencies of adolescents for the purpose of reducing overall substance use.

ARTICLE 1: TREATING ADOLESCENT DRUG ABUSE: A RANDOMIZED TRIAL COMPARING MULTIDIMENSIONAL FAMILY THERAPY AND COGNITIVE BEHAVIOR THERAPY

SUMMARY

In addition to the effectiveness of environmental strategies, which aim to make changes in the ecological context around substance use, emerging substance abuse prevention research has begun to explore the connection between cognition, interpersonal dynamics, and behavioral health. According to Liddle (2008), **interventions that include cognitive-behavioral therapy (CBT) and multidimensional family therapy approaches (MDFT) can be considered promising approaches to reducing adolescent substance use and misuse.**

Liddle and colleagues conducted a randomized control study, in which participants received either a CBT or MDFT-based intervention. Participants were mainly low-income, African-American young men, aged 15 years old, most of whom were referred from the juvenile justice system. 75 percent of study participants were classified as being “cannabis dependent,” and 20 percent of whom were classified as being “alcohol dependent.” Thirteen percent were classified as “other drug dependent” (Liddle, 2008, p. 1661). Participants were randomly assigned to receive either CBT or MDFT.

Cognitive-behavioral therapy suggests that substance use is a learned behavior, and acknowledges that environmental factors (e.g., the household, community, social networks, and others) can lead to substance use and misuse, and cognition plays a role in this use/misuse. In conjunction with their parents, school officials, and juvenile justice officials, participants identified problem areas to focus on, with the goal of increasing coping skills and reducing unhealthy behaviors (i.e., substance use).

Multi-dimensional family therapy is a treatment option that aims to provide tools for communication, coping, interpersonal relationships (i.e., including working with parents to set appropriate boundaries, and decreasing emotional conflict and increasing problem-solving), and navigating systems (e.g., the juvenile justice system) in order to foster a number of different competencies.

The results found that both CBT and MDFT are “efficacious treatments” (p. 1667) under certain conditions; however, MDFT is more successful in “decreasing drug severity...[which] is important because they reveal the extent of impairment resulting from drug use” (p. 1667). In addition, **the effects of MDFT were found to be significant one-year after treatment completion; one year later, 64% of**

youth receiving MDFT treatment showed minimal drug use, compared to 44% of youth in CBT condition.

REFERENCE

Liddle, H. A., Dakof, G. A., Turner, R. M., Henderson, C. E., & Greenbaum, P. E. (2008). Treating adolescent drug abuse: A randomized trial comparing multidimensional family therapy and cognitive behavior therapy. *Addiction*, *103*(10), 1660-1670.

ARTICLE 2: COGNITIVE BEHAVIORAL THERAPY FOR SUBSTANCE USE DISORDERS

SUMMARY

In attempting to establish the effectiveness of cognitive-behavioral therapy (CBT) for substance abuse disorders (SUD), McHugh et al conducted a meta-analytic review of CBT for drug dependence. They examined 34 randomly controlled trials, finding a “moderate effect” ($d=0.45$), **suggesting that CBT, on the whole, can be a valuable tool in reducing drug use, misuse, and dependence.** They then examined the effectiveness of a number of different cognitive-behavioral therapies, including **motivational interviewing (MI), contingency management (CM), couples and family therapy, skills training, and a number of emerging treatments that use a combination of the above interventions.**

The information below highlights the efficacy of each “mode” of CBT in regard to reducing drug use, misuse, and dependence.

Motivational Interviewing (MI) aims to elicit the particular psychological reasons for substance use, aiming to help users establish reasons for behavioral change through “motivational enhancement.”

Often, MI is used in individual treatment settings, although participants can also work in groups. Though MI can be used a stand-alone treatment for short-amounts of time, it can also be combined with other strategies over a longer period of time, which the authors note resulted in “greater efficacy” (2010, p. 2). Overall, the authors noted that MI results in a “moderate” effect.

Contingency Management (CM) aims to counter the reinforcing effects of substance use by providing rewards for abstinence (e.g., often in the form of money or voucher for goods or services). Many programs included in this meta-analysis suggested that the use of both small prizes (\$1), in conjunction with a chance to win a larger prize (\$50), is fiscally effective and also motivation for non-use (2010, p. 3). The effect of CM is “moderate to large.”

Relapse Prevention (PR) intends to educate substance users to identify high-risk situations that may trigger relapse, such as preferred bars or friends who use. In RP, substance users are provided information that counters their “expectation of perceived positive effects of use” (p. 3). RP was found to have a small effect for reducing substance use, but a large effect for overall behavioral health.

Behavioral-Couples Therapy (BCT) serves to point out the connections between negative consequences of substance use and dysfunction within a couple, “whereby substance use can have a detrimental effect on the relationship and this relationship distress can lead to increased substance use” (2010, p. 4). This treatment aims to improve partners’ coping skills, to provide rewards for abstinence from substance use, and to reinforce partners’ enjoyment of activities that can be shared without the use of substances. In short, the aim of BCT is overall relational flourishing, and the authors noted that BCT is related to a decrease in frequency of use and “improved relationship functioning” (p. 4).

Skills Training intend to provide users with increased coping, communication, problem-solving, interpersonal, and emotional regulation skills, so that users are less likely to use, misuse, or abuse substances. Interpersonal skills have been shown to be an important factor in abstinence; support from family members and peers is linked to both relationship functioning and non-use. This social support can assist users in rejecting substance by providing “role-playing” opportunities where individuals can learn refusal skills. Emotional regulation skills help to decrease distress by helping users develop skills to manage the chaos of everyday life. At the same time, patients are instructed to find joy in sober activities (whereas there might have been little before).

Overall, different kinds of cognitive-behavioral therapy have been shown to be effective in a number of different settings, dependent on a number of factors. However, there are similarities across CBTs as a whole. **The authors reported, “Consistent across interventions is the use of learning-based approaches to target maladaptive behavioral patterns, motivational and cognitive barriers to change, and skills deficits” (p. 6).** Research continues to be an important factor in determining which particular combination of CBT may be the most effective tool in reducing drug use, misuse, and abuse.

REFERENCE

McHugh, R. K., Hearon, B. A., & Otto, M. W. (2010). Cognitive behavioral therapy for substance use disorders. *Psychiatric Clinics*, 33(3), 511-525.

ARTICLE 3: GENDER-SPECIFIC INTERVENTION TO REDUCE UNDERAGE DRINKING AMONG EARLY ADOLESCENT GIRLS: A TEST OF A COMPUTER-MEDIATED, MOTHER-DAUGHTER PROGRAM

SUMMARY

While many substance abuse prevention programs focus on reducing the negative consequences of use and misuse by young men, **Schinke et al (2008) reported that young women are also engaging in alcohol use at increasing rates.** For example, up to one-third of young women have drunk alcohol by the time they begin high school, and girls are drinking heavily (e.g., defined as five drinks in one sitting) at a rate similar to young men (p. 70). **Girls' underage drinking seems particularly dangerous, as it is associated with "unsafe sexual behavior, school failure, riding in automobiles with impaired drivers and later misuse of alcohol"** (p. 70).

For these reasons, Schinke et al suggested that, in order to be successful, **interventions should focus on risk and protective particular to young women, such as those emphasizing relationship-building, parental monitoring, and positive social supports.** Research has found a number of risk factor for later alcohol use, including poor familial relationships (e.g., especially with mom), minimal parental monitoring, and infrequent meals shared with family members (Schinke, 2008). **On the other hand, having strong parental relationships can mitigate harmful peer substance use effects.** In addition, online interventions expand service delivery, offering participants options for how to access services. Therefore, family-based, online interventions may be a viable strategy for reducing the consequences of alcohol use in young women.

Schinke and colleagues enrolled mother-daughter dyads in order to enhance young women's relationship with their mom, and to teach them cognitive-behavioral skills to avoid underage drinking (p. 72). **The pairs completed online modules that aimed to increase communication, develop conflict-management skills, understand the media's role in alcohol promotion, and to practice alcohol refusal skills.**

The online intervention "modestly support the viability of a mother-daughter, [online] program to prevent underage drinking" for young women (2008, p. 74). The study found that **young women reported an improvement in conflict-management skills, alcohol refusal skills, and noted that they drank less after the intervention.** In addition, participants noted that their communication skills increased as well, offering them ways to communicate effectively with their mom, especially in the area of parental monitoring and self-efficacy.

Overall, this intervention suggested the effectiveness of gender-specific programming, especially those that are aimed to improve family dynamics, and those that are offered online.

REFERENCE

Schinke, S. P., Cole, K. C., & Fang, L. (2009). Gender-specific intervention to reduce underage drinking among early adolescent girls: A test of a computer-mediated, mother-daughter program. *Journal of Studies on Alcohol and Drugs*, 70(1), 70-77.

ARTICLE 4: MINDFULNESS-ORIENTED RECOVERY ENHANCEMENT FOR CHRONIC PAIN AND PRESCRIPTION OPIOID MISUSE: RESULTS FROM AN EARLY-STAGE RANDOMIZED CONTROLLED TRIAL

SUMMARY

Garland et al (2014) reported on a novel intervention designed to test the effectiveness of a novel, multidimension intervention for patients with chronic pain, who take prescription opioids (e.g., even those who take large amounts of prescription opioids). The authors noted that, although prescription opioids are effective at treating chronic pain, **there is a significant portion of this population who may be “exhibit addictive tendencies towards opioids,” perhaps as high as 10% of patients with chronic pain (2014, p. 2). Further, Garland and colleagues argued that those in chronic pain typically do not respond well to motivation enhancement or behavioral therapies alone.** Therefore, there is a need for a multidimensional intervention that includes mindfulness training, cognitive reappraisal skills, and emotional regulation “designed to modify attentional biases, habit behavior, affective dysregulation, and autonomic stress responses underlying the feedback loop between chronic pain, craving, and opioid misuse behaviors” (2014, p. 3).

Garland et al investigated the effectiveness of this multidimensional intervention named MORE, as compared with support groups, a common therapeutic intervention for patients exhibiting addictive tendencies. **Participants receiving the multidimensional MORE intervention took part in mindfulness training, cognitive reappraisal training, and emotional regulation training (e.g., learning to enjoy life’s pleasures and emotions),** while those in the control group participated in support groups where they discussed the various dimensions of living in chronic pain, including dealing with opioid cravings, unpleasant emotions, and how to plan for the future (2014, p. 6).

The results from this intervention were promising, and notable. **First, participants in the MORE intervention “significantly reduced symptoms associated with chronic pain and prescription opioid misuse,” leading to larger improvements in “pain severity and pain-related functional interference”** than participation in the traditional support group (p. 13). In addition, these improvements stayed constant at the three-month post-intervention mark, which the authors reported is “notable, given that many participants were taking prescription opioids in large doses” (p. 13). These findings are coupled

with participants reporting a “significant” decreased desire to use opioids, which aligned, the researchers proposed, with de-linking “craving desires from addictive behaviors” (p. 14).

To conclude, the authors noted that “among patients suffering from chronic pain **MORE reduces pain severity and functional interference for up to 3 months following treatment and decreases sympathetic stress arousal, desire for opioids, and disordered opioid use at the end of treatment**” (2014, p. 15). The authors suggested that cognitive skills training (i.e., mindfulness training, which helped participants focus on their opioid cravings; cognitive reappraisal, which taught participants coping mechanisms, and nonreactive skills, which demonstrated to participants the importance of interpreting affective pain as a sensory mechanism) helped patients in chronic pain learn to regulate cognitive and behavioral mechanisms associated with opioid dependence.

REFERENCE

Garland, E. L., Manusov, E. G., Froeliger, B., Kelly, A., Williams, J. M., & Howard, M. O. (2014). Mindfulness-oriented recovery enhancement for chronic pain and prescription opioid misuse: Results from an early-stage randomized controlled trial. *Journal of consulting and clinical psychology, 82*(3), 448.

ARTICLE 5: A RANDOMIZED TRIAL OF CONTINGENCY MANAGEMENT FOR ADOLESCENT MARIJUANA ABUSE AND DEPENDENCE

SUMMARY

Stanger et al (2009) reported that marijuana is widely used by young people (“the majority of all adolescents in substance abuse treatment report marijuana as their primary substance”), and **that the number of young people in marijuana treatment has tripled in the period between 1992 and 2002** (p. 2). This, coupled with research that suggests the effectiveness of cognitive-behavioral therapy (CBT) as part of a multidimensional program, served as the impetus for the author’s novel intervention.

This intervention used a number of novel treatments, including contingency management (e.g., rewarding children for abstaining from substance use and providing consequences for use), to motivational enhancement and cognitive-behavioral health. **The authors noted that contingency management (CM) is designed “to increase adolescents’ motivation for abstinence and enhance parents’ abilities to use effective parenting to decrease substance use and other problems” (p. 3).**

This study found that CBT, in conjunction with motivational enhancement and contingency management, “resulted in enhanced abstinence outcomes during the treatment period compared with control condition” (2009, p. 9). Roughly half of the participants had 8 weeks of documented abstinence

from substances. **The authors found that participants receiving cognitive-behavioral therapy and motivational enhancement “improved on measures of internalizing and externalizing psychopathology” (p. 10).**

The authors conclude that while these programs are emerging, some challenges remain for the use of these interventions. **Despite a novel intervention including contingency management, cognitive-behavioral therapy, and motivational enhancement, many adolescents were unable to achieve abstinence from substances, and those who did were likely to relapse (2008, p. 11).**

REFERENCE

Stanger, C., Budney, A. J., Kamon, J. L., & Thostensen, J. (2009). A randomized trial of contingency management for adolescent marijuana abuse and dependence. *Drug & Alcohol Dependence, 105*(3), 240-247.

CONCLUSION

Substance abuse remains a costly challenge for the United States, one that has severe economic, social, political, and behavioral consequences for the millions of Americans who face the challenges of substance use, misuse, and abuse. This research review provided a summary of five key articles that explain the connections between behavioral health and cognition, as well as exploring emerging interventions and treatments aimed at helping individuals develop cognitive, emotional, and social skills to handle the destabilizing forces of everyday life without relying on substances.

First, Liddle et al (2008) demonstrated the effectiveness of both Cognitive Behavior Therapy (CBT) and Multidimensional Family Therapy (MDFT) in reducing adolescent substance use and misuse. Both CBT and MDFT aim to provide individuals with tools to support the development of communication and interpersonal skills, and emotion regulation. While CBT and MDFT were almost equally effective, MDFT showed more lasting improvements (i.e., at one-year post intervention).

Second, McHugh et al (2010) conducted an extensive meta-analysis of research literature on the effectiveness of CBT in treating substance use and abuse. They analyzed particular “modes” of CBT, finding that CBT can be a valuable tool in reducing drug use, misuse, and dependence. There a number of effective interventions, including contingency management (CM), motivational intervention (MI), relapse prevention (RP), behavioral couples therapy (BCT), and skills training. The authors reported, “Consistent across interventions is the use of learning-based approaches to target maladaptive behavioral patterns, motivational and cognitive barriers to change, and skills deficits” (p. 6).

Third, Schinke (2008) and colleagues investigated an innovative program designed to respond to the increasing rates of young women engaged in underage drinking. Girls' underage drinking seems particularly dangerous, as it is associated with "unsafe sexual behavior, school failure, riding in automobiles with impaired drivers and later misuse of alcohol" (p. 70). The authors found that after completing online modules that provided training in communication, conflict management, media literacy and alcohol refusal, young women reporting drinking less and improvements in communication and conflict management.

Fourth, Garland et al (2014) designed a novel intervention to test the effectiveness of a multidimensional intervention for patients with chronic pain and take prescription opioids (e.g., even those who take large amounts of prescription opioids); many of these patients are at risk for opioid dependence. According to the authors, this intervention was successful, and patients in the treatment group who received training in mindfulness, cognitive reappraisal, and emotion regulation. Participants in the intervention "significantly reduced symptoms associated with chronic pain and prescription opioid misuse," leading to larger improvements in "pain severity and pain-related functional interference" (p.13), and these gains were present three months following treatment.

Fifth, Stanger et al (2009) reported on an innovative intervention designed to test the effectiveness of CBT, contingency management (CM), and motivational enhancement (ME) in reducing adolescent marijuana use and misuse. This study found that CBT, in conjunction with motivational enhancement and contingency management, "resulted in enhanced abstinence outcomes during the treatment period compared with control condition" (2009, p. 9).

In short, many innovative interventions and treatments are emerging that attempt to explore the relationship between cognition, behavioral health, and substance use.

AUTHOR INFORMATION

Benjamin Gleason, PhD is the Director of Applied Research for the Prospectus Group. He earned a PhD in Educational Psychology & Educational Technology from Michigan State University, researching how to best support communities of learners through educational technology. Before academia, Benjamin has worked in youth and adult- serving learning spaces for almost fifteen years, from designing youth-initiated community service projects and teaching high school in Richmond, California, to working as a university instructor in Guatemala. Benjamin is also a founder of the Prospectus Group.

