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Treating Substance Use Disorders with Cognitive Behavioral Therapy and Growth Mindset Interventions

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Abstract. Substance use disorders (SUDs) affect a relatively small portion of the population, yet their consequences extend far beyond those struggling with addiction. The effects of it spread to their families, communities and to larger social systems. One of the most evidence-based treatments of substance abuse is Cognitive Behavioral Therapy (CBT). On the other hand, the Growth Mindset Intervention (GMI) method is a new area of research. GMI is based on the Growth Mindset Theory, a widespread concept that has been incorporated into the Psychology curriculum. Nevertheless, limited studies have been conducted on how Growth Mindset Theory can be applied in the non-educational environment. This paper will review peer-reviewed articles on CBT and GMI and assess the merits and demerits of both methods with particular attention to how they treat SUDs. The findings suggest that GMI may complement CBT by reframing identity and increasing treatment engagement, particularly for individuals who view addiction as a fixed aspect of themselves. It could be beneficial to integrate GMI into the early stages of treatment as well as into maintenance beyond formal sessions.

Keywords: Substance Use Disorders, Cognitive Behavioral Therapy, Growth Mindset

1. Introduction

Substance use disorders (SUDs) are long-term conditions that are difficult to overcome. It is through coping capacity, self-efficacy and self-esteem that resilience is created. The recovery process needs change in behavior as well as resilience, as those who developed greater resilience were significantly less likely to relapse [1]. Relapse rates for SUDs are between 40% and 60%, making relapse common and similar to other chronic illnesses [2]. Among a cross-sectional survey of individuals with SUD, the prevalence of relapses was 59.9%. Individuals hospitalized for a shorter period of time were 11.2 times more likely to relapse [3]. SUD affects a relatively small portion of the population but leads to substantial health, economic, and social impact. Therapy is a management of the condition, and relapses is likely once the individual no longer stays in treatment [2]. Relapse can be dangerous for some drugs and lead to severe symptoms and even mortality. It is therefore important to develop therapies that can help the brain adapt to abstinence. The purpose and scope of this review are to examine existing empirical studies and investigate the effectiveness of two theoretical interventions for treating SUD: Growth Mindset Intervention (GMI) and Cognitive Behavioral Therapy (CBT).

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2. Core concepts

2.1. Growth Mindset Intervention (GMI)

In this context, GMIs are defined as any intervention that incorporates the Growth Mindset Theory. Growth Mindset Theory, proposed by Carol Dweck, is a theory that distinguishes between two different types of thinking: fixed mindset and growth mindset, concepts that have been increasing in popularity [4]. Those with a fixed mindset view abilities like intelligence as innate, while those with a growth mindset view those abilities as malleable [5]. Dweck's theory proposes that having a growth mindset benefits individuals by viewing challenges as opportunities to grow and interpreting setbacks as a part of learning.

Combining the Growth Mindset theory with recovery from substance abuse, GMIs could be beneficial by encouraging individuals to reinterpret addiction as a condition rather than a fixed personal flaw. Longitudinal alcohol-use study demonstrated that growth mindset mediated the connection between identity as a drinker and consumption of alcohol over time [6]. Clinically, neuroplasticity, the brain’s capability to change, may be the reason why therapy could cause enduring changes in cognition and behavior. Growth mindsets also prove more resilient in people faced with challenges such as addiction, in part due to their alignment with theories of neuroplasticity [7,8].

2.2. Cognitive Behavioral Therapy (CBT)

CBT is a therapeutic approach that changes maladaptive ways of thinking. A functional analysis is one of the significant elements of CBT where both the individual and the therapist work together to identify and then modify patterns of thinking. This pattern encompasses antecedents, behavior and consequences and this will enable the clients to comprehend the way maladaptive habits are maintained [9,10]. Other methods that are incorporated in CBT include cognitive restructuring to help clients develop adaptive coping mechanisms. Such strategies assist the clients to substitute disorganized thinking with more helpful thoughts, improving mood and quality of life in general. The underlying theory draws from cognitive psychology, that through reinforcement, learned behavior and thought patterns can be altered [11].

2.3. Substance Use Disorder (SUD)

According to the Diagnostic and Statistical Manual of Mental Disorders (DSM - 5), Substance Use Disorder (SUD) is defined as a pattern of using substances problematically that leads to significant impairment or distress [12]. The diagnosis of SUD is found on the presence of at least 2 out of 11 criteria within 12 months. Based on the number of criteria people satisfy by using drugs or alcohol in a way which causes serious problems in their lives, people can be categorized into three severity levels. Matching two to three criteria represents mild, matching four to five represents moderate, while matching six or more criteria potentially lead to the diagnosis of severe SUD. The current view of addiction acknowledges interplay between neurobiological, psychological, and social aspects of addiction. Therapy, community support may be included in treatment, medicine, and support.

Under SUDs, there are a variety of substance specific disorders that share common diagnostic criteria but vary in terms of their physiological, psychological, and social effects. Such differences can be helpful in the choice of the right interventions and targets. Alcohol Use Disorder (AUD), an

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abnormal consumption of alcohol leading to serious problems. The symptoms might be an unsuccessful effort to decrease drinking, interpersonal difficulties, and physiological withdrawal. AUD has established medical risks that include liver disease, cardiovascular and cognitive impairment. The problematic use of cannabis resulting in impairment or distress is Cannabis Use Disorder (CUD). Opioid Use Disorder (OUD) involves the problematic use of prescription or illegitimate opioids. Dysphoria, nausea, and intense cravings can be considered the withdrawal symptoms of OUD. OUD is associated with increased risks with both overdose and mortality. Nicotine Use Disorder or Tobacco use Disorder is also prevalent, and it consists of dependence on tobacco products. Nicotine use is legal and normalized, but it has proven to be among the most dangerous substances in the world as it is related to cancer, cardiovascular diseases, and long-term respiratory diseases.

3. The effect of CBT on SUD

CBT is a therapeutic approach with a solid empirical research basis. Mental health professionals use CBT to teach coping skills, relapse prevention strategies, and offer problem-solving techniques in a goal-oriented way that help clients manage their behaviours [13]. Randomized controlled trials (RCTs) and meta-analyses show that CBT works for alcohol use disorders and for illicit drug use disorders [14]. Researchers collected neuroimaging data and investigated different techniques, ultimately finding CBT effective at the neurobiological level [15]. Through several trials, cognitive - behavioural approaches seem to normalize the reduced activation in the prefrontal areas of the brain, which is commonly observed in individuals with SUDs. This supports the idea that therapy can help restructure neural circuits changed due to addiction., and the results demonstrated the efficacy of CBT at a neurobiological level [15]. Across multiple trials, cognitive-behavioural approaches appear to normalize the hypoactivation within the prefrontal regions commonly seen in individuals with SUDs, supporting the notion that therapy can help reorganize neural circuits changed in addiction.

A narrative review of evidence for CBT found that the literature supports the effectiveness of traditional CBT for SUD treatment, although the results were highly heterogeneous [16]. Studies on tobacco and nicotine dependence offer mixed but generally supportive findings. The comparison between different contingency management (CM) structures that use rewards to reinforce positive behaviours suggests that long-term outcomes are achieved regardless of reinforcement schedules. These findings suggest CBT is effective for smoking cessation but may show its best effects when paired with behavioural reinforcement strategies.

Reviews also demonstrated the effectiveness of CBT in treating alcohol use disorder (AUD) in a digital format. It was found that adding technology to the equation did not affect the working alliance between therapist and client [17]. Meta-analytic findings confirm that CBT performs better than no treatment or minimal treatment, though not always better than other active treatments [18]. The follow-up data show that the effects of CBT for SUDs last around six to twelve months after treatment [18]. This suggests CBT has long-term effects in potential relapse-prevention over time.

CBT is effective for cannabis use disorder (CUD), with evidence showing superiority over treatment-as-usual, particularly in RCTs with psychiatric populations [19, 20]. Studies on opioid, benzodiazepine, and cocaine use show more variable evidence. CBT was shown to be effective in reducing opioid use and stress, co-occurring chronic pain, and OUD [21]. This RCT examined the effectiveness of a treatment that focused on internal cues for drug use, known as CBT for Interoceptive Cues (CBT-IC) [22]. However, CBT-IC did not outperform standard drug counselling [22]. In 25 RCTs, CBT combined with tapering, the slow reduction of medications, reduced benzodiazepine use within a three-month period. In long-term follow-ups of over six months, the

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treatment was no longer effective [23]. Nevertheless, treatment adherence and therapeutic alliance appear central to successful outcomes [17].

A growing body of research explores different populations and supports digital CBT. Telehealth CBT performs on the same level as in-person CBT for co-occurring depression and alcohol misuse [24]. Web-based CBT and computerized CBT consistently reduce the misuse of substances, either as a stand-alone treatment or when added to usual care. Telehealth CBT delivered through video sessions or mobile platforms also improves relapse prevention outcomes. However, evidence for individuals with serious mental illness is inconsistent. Across 32 RCTs, there was not enough evidence to prove that CBT is significantly more effective than other standard care [25].

While CBT is a decently reliable intervention for SUDs, it is by no means perfect. Its positive outcomes were linked to a variety of factors. They are the involvement of clients, the severity of sessions, and the continued support during the recovery. This is, however, highly variable among populations. More studies are required to evaluate the intervention in RCTs, evaluate among different populations, and whether or not the specific intervention can be generalized to other SUDs.

4. The effect of GMI on SUD

GMI is an emerging area proposed for its potential benefits from reshaping innate beliefs about addiction-related behaviours [26]. However, while there are countless studies on CBT and a growing amount of research on GMI, there is little research focused on its use in SUD. Parada conducted a review to examine how the mindset theory has been applied to research [27]. Of the 1903 records screened, 18 studies met the criteria. It was found that the field remains limited and methodologically underdeveloped. Most existing studies relied on cross-sectional designs and self-reports, and not a lot of RCT exist, which limits causal inference.

One pilot study tested a web-based GMI in a smoking-cessation app. The pilot found higher cessation rates among participants who engaged with the mindset content [26]. The web-delivered mindset intervention did not significantly increase engagement, measured by the number of log-ins. Still, among those who engaged with the intervention at least once, the GMI group had higher 30-day abstinence at 2-month follow-up (21% vs. 13%, P = .03). The authors concluded that GMI is feasible to implement and may increase cessation success.

GMI could also moderate the adverse effects of substance use among adolescents. When 1,759 adolescents with substance use experience were surveyed, substance use was found to be negatively correlated with reasoning. However, for those with a stronger growth mindset, the negative association, especially for illicit drug use, was weaker [28].

In a longitudinal study examining growth mindset and heavy drinking/alcohol use in adults, 422 heavy-drinking participants with stronger growth mindsets reported greater reductions in alcohol consumption over 8 months, especially among those who had a strong drinking identity at baseline [5]. The authors interpret this as evidence that mindset beliefs can moderate the link between identity and drinking behaviour. For those whose identity is tied to drinking, seeing themselves as a drinker, believing that “alcoholism is changeable,” seems to help them decrease consumption over time [5].

While CBT focuses on identifying maladaptive thoughts and acquiring coping skills in the present, GMI targets the client's fundamental belief systems. GMI could shift the client’s underlying assumptions about their capabilities and about whether addiction is changeable. The alcohol-drinking identity study suggests GMI may work particularly well where identity is a risk factor: if someone strongly identifies as a “drinker” or “addict,” GMI may help reframe that identity as not

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permanent and open a path toward change. This aspect of GMI helps maintain what CBT alone may not explicitly address.

Noting that there is a lack of literature for GMI on SUDs, Parada attempted to design a formal intervention for alcohol use combining mindset change and planning strategies, using empirical data [27,29]. The study describes the intervention aimed at reducing alcohol consumption by integrating growth mindset and implementation intentions. Using a mixed-methods design, the authors first conducted four focus groups with both general-population drinkers and clinical patients with alcohol use disorders to explore beliefs about alcohol, perceived malleability of drinking behaviour, common triggers, and strategies used to cope with drinking urges. They identified arguments supporting the idea that alcohol use can change, as well as typical high-risk situations and coping responses. The resulting Growth Mindset integrated with Implementation Intentions (GMII) intervention consists of several components: a popular-science article conveying alcohol use as a malleable behaviour, two internalization exercises designed to deepen endorsement of a growth mindset, and a volitional help sheet that guides participants in creating "if-then" plans linking high-risk drinking situations to specific coping actions. The study, however, focuses solely on developing the intervention rather than evaluating its efficacy and reliability. As a result, the extent to which GMII changes long-term substance abuse patterns remains unknown. Further research is needed to test the intervention in randomized controlled trials, test across diverse populations, and determine whether the specific approach can extend to other SUDs.

5. Discussion and suggestion

5.1. Overall findings

CBT remains a empirically supported intervention to SUD, particularly in terms of substance abuse reduction and relapse prevention when appropriately delivered and sustained. Despite its strengths, CBT is not a perfect or universal approach to treatment. Engagement, therapist skill, and adherence to the protocol all have a large bearing on the efficacy of CBT. Long-term CBT shows improvements, but its ability to maintain abstinence post-treatment is still questionable. Prolonging commitment to sessions might not be feasible for all clients. Intensive CBT may also be inappropriate for individuals who have not yet met the requirements of SUD diagnosis or with individuals whose substance use can be considered as mild or moderate. Therein, they can be served better by low intensity, scalable interventions such as GMI.

GMI has been shown to be successful in reducing drug or alcohol intake or changing consistent excessively damaging drinking habit over time, specifically for people whose identity is strongly tied to substance use. The combination of GMI and digital tools appears feasible and improved cessation outcomes compared to app alone [26]. Nevertheless, the evidence that is available today is still initial and is prone to a number of limitations. Most of the available research is based on self-report and follow-up of a limited duration, often between two to eight months instead of analysing results over a long period of time. Generalizability is also an issue with the study of heavy drinking restricted to recent U.S. college graduates, a rather privileged demographic. Only the 2-month-long follow-up was carried out in the study, and therefore researchers do not know the long-term abstinence or the risk of relapse [26]. GMII intervention had not been subjected to longitudinal RCT. According to the example of smoking cessation RCT, GMI was not observed to contribute to engagement, which puts difficulties on digital or self-administered interventions [26]. The findings observed among populations of relatively light drinkers might not be applicable in a clinical context

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of SUDs. This raises doubt whether GMI can produce clinically meaningful change on its own, especially for severe addiction.

5.2. Implications for practice

Practitioners could include GMI modules providing psychoeducation on neuroplasticity and the potential for behavioural change at the start of treatment. GMI can be particularly applicable to clients who strongly self-identify with a label such as "addict". The idea that a person is not obliged to such labels permanently may create a new motivation to change even in absence of mindset change. Simple language about growth-mindset can also be employed by therapists, expressing the idea to the clients that one can change and learning involve setbacks. This could diminish shame and make clients participate in the treatment instead of dropping out.

5.3. Future research

Further studies may determine the efficacy of GMI through conducting more RCTs. Further studies could also aim at assessing online versions of CBT and GMI. Ideally, bigger and heterogeneous participants need to be enlisted. Access to underserved populations is essential since many people lack access to care due to various barriers that they have to overcome. Cheap interventions like online programs can decrease disparities through reaching the underserved groups that do not or cannot access traditional treatment.

Additionally, research to make the GMI a more coherent subject concerning whether it works, how, and why may be fruitful in relation to the further development of GMI and its integration with other methodologies. It is unclear as to whether GMI can enhance self-efficacy, change personal identity away labels, enhance coping, lessen self-stigma, or enhance personal commitment and perseverance in the treatment. To effectively determine the potential of GMI in the SUD environment under specific consideration, it should be further work in the future to implement additional longitudinal RCTs that will test the practice of standalone GMI and integrated GMI with CBT interventions.

It is also essential to expand sample diversity as well as representativeness. Research may be carried out at different substances, levels of severity, age groups, socioeconomic statuses, and cultural backgrounds. As an illustration, the sample may be tested which includes not only smokers or heavy drinkers, but also people having difficulty with other substance dependence. Such measures should be objectively recorded in the form of attendance, relapse rates, neural plasticity indicators through neuroimaging and long-term post 6 months follow-up. Additional studies of these approaches such as RCTs can help conclude how the approaches can be effective, to whom, and on which conditions they are most effective.

6. Conclusion

Considering the advantages and disadvantages of both models, CBT and GMI, an integrated approach could be offered. Individuals can be trained through GMI to change their self-defeating thoughts, thereby increasing their willingness to engage in CBT and other treatments. For individuals reluctant to enter therapy, a web-based GMI/GMII program could serve as their first step towards receiving treatment. Patients with more severe SUD or those that require more profound intervention can consider it useful to transition into CBT for more intense structured treatment. During post-acute CBT, it could also be useful to maintain motivation and self-efficacy using GMI-

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based modules as a maintenance measure after the behaviour change has been implemented. This continuing mindset support can help individuals cope with setbacks, maintain abstinence, and avoid the shame-guilt spiral if relapse occurs.

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