

Manifestations and Treatment of Alcohol Addictive Behavior under Coronavirus Disease 2019 (COVID-19)

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Abstract. The topic of alcohol addiction has been on the world's radar. Since the global outbreak of COVID-19, people worldwide have been affected by COVID-19 to varying degrees, including economically, in health, and in education. In the context of COVID-19, the psychosocial strain has caused an escalation in alcohol addiction and issues such as suicide, violence, and severe alcohol dependence, leading to increased attention to alcohol addiction. This paper aims to examine the reasons for the increase in alcohol addiction (both new and relapsed) and the generalization of treatment options (pharmacological and non-pharmacological) for alcohol addiction in the context of COVID-19 through a biopsychosocial model. The mechanism of alcohol addiction involves different levels such as biological, psychological and social. This paper also discusses the advantages and disadvantages of popular online counseling in the context of the epidemic. For the individual, this paper may help enhance the future treatment of alcohol addiction to mitigate the harmful effects of alcohol addiction on the individual. This paper also provides a reference for research in related fields. More research into the treatment of alcohol addiction in the context of a large epidemic could help alleviate the suffering of patients in the future.

Keywords: COVID-19; Alcohol addiction; Treatment; Transmission; Biosocial-psychological model.

1. Introduction

Since the COVID-19 outbreak in 2019, there has been an upward trend in the number of COVID-19 infections detected worldwide. Furthermore, a dramatic increase in the number of confirmed diagnoses. Using mathematical models, researcher investigated whether COVID-19 can reduce transmission by isolating infected patients and contacts, and found that the validity of using isolation to prevent the spread of COVID-19 [1]. As isolation of patients and contacts reduces the transmission of COVID-19, countries have begun to implement varying degrees of restriction. The introduction of quarantine policies has had an impact on the global economy. Restrictions were also associated with an increase in suicide rates [2]. The social and financial pressures have caused a sharp rise in alcohol consumption. From the beginning of the COVID-19 outbreak through March 2020, alcohol sales in the U.S. grew 54% year-over-year; online sales increased 262% compared to 2019 [3]. Moreover, as alcohol use and alcohol addiction are closely linked, it becomes essential to focus on the reasons for the rise in alcohol addiction in the context of COVID-19 and treatment.

Socio-cultural factors are responsible for the beginnings of alcohol addiction. The mechanisms of addiction are related to an individual's social background, consumption status, and educational attainment. Each individual is influenced differently and with different importance [4]. In past research on alcohol addiction, few kinds of research contemplate the influences of worldwide events like COVID-19 on the rise of alcohol addiction, which is a gap in the mental health field. In order to prevent the ensuing large-scale human health, livelihood, and economic catastrophe, the increase in the number of alcohol addicts is prevented. This paper will analyze the causes of rising alcohol addiction (relapse and addiction) in the context of COVID-19 through a biopsychosocial model and summarize treatment options for alcohol addiction.

This review will divide into the following parts in the next section. The first part is to present the diagnostic criteria for alcohol addiction in the DSM-5 and the manifestations of alcohol addiction, focusing on the negative consequences. The second part of the study analyzes why alcohol addiction is rising during the COVID-19 period through data reflecting the rise in alcohol consumption and

alcohol addiction and through a biopsychosocial model. The third section summarizes some approaches to treating alcohol addiction, encompassing pharmacological and non-pharmacological therapies. It will discuss the current state of popular online counseling and future challenges and research directions.

2. Alcohol Addiction in the Context of COVID-19

Clinicians have different diagnostic criteria for alcohol addiction. Alcohol disorders should routinely screen for using clinical interviews, questionnaires, blood tests, or a combination of these methods. According to the description of alcohol addiction in the DSM-5 [5]: Alcohol addiction, a dysfunctional pattern of drinking, results in a clinically significant impairment lasting 12 months (for which at least two of the following criteria must be met)

- a. chronic heavy drinking
- b. persistent desire/great effort to abstain from alcohol
- c. time invested in buying, drinking, or recovering from the effects of alcohol
- d. craving
- e. repeated drinking, but lack of social and family integration
- f. continued drinking despite relationship and career deficits
- g. reduced participation in social, family, and occupational activities due to alcohol use
- h. Drinking in situations that are risky to health
- i. continuing to drink despite the increased risk of poor health
- g. tolerance
- k. Withdrawal

Depending on the symptoms, there are also three categories of severity when diagnosing alcohol addiction. The presence of 2-3 symptoms defines as Mild, 4-5 symptoms describe as moderate, and 6 or more will define as Severe.

Alcohol addiction dependence and abuse can be harmful to both the physical health and mental health of the patient. Prolonged and heavy drinking can lead to cardiovascular disease, gastrointestinal problems, and liver cirrhosis. It can also impact the brain, including cognitive and sleep disorders. The mental health effects of heavy alcohol use are mostly comorbid. And there is also an association between alcohol addiction and suicidal behavior, with one study estimating that the lifetime risk of suicide for alcoholics is about 2-5% [6]. Alcohol addiction can also contribute to violence, as explained in the attention model proposed by Taylor and Leonard, which explains the cognitive distortions of alcohol use. Cognitive errors affect cognitive behavior causing errors in comprehension and expression [7]. Such mistakes in understanding and expression occur in social activities predisposing to violence. The most common forms of this violence are partner violence, domestic violence, and sexual violence.

3. Biopsychological Model

In past research, conventional medicine considered addiction a chronic recurrent brain disease with genetic causes. The disease model of addiction assumes that addiction's social, psychological, and behavioral aspects are not as important. However, many medical practitioners believe psychological, social, and biological factors are equally important in the biopsychosocial model [8].

3.1 Psychological Model

Among the psychological factors, this paper focuses on self-efficacy theory to explain the rise in alcohol addiction during COVID-19. Self-efficacy theory posits that people are less susceptible to alternative coping strategies in the face of an inability to cope with a situation or negative influences. A decrease in self-efficacy in the ability to reject the use of addictive substances when faced with future challenges ultimately increases addictive behaviors [8]. Following the outbreak of COVID-19,

job losses and unemployment increased as restrictive solid measures were implemented [2]. the effects of COVID-19 are long-term and may cause dependence on addictive substances for some individuals under the stress of facing long-term unemployment. According to research on the unemployed and alcohol consumption, unemployment significantly affects alcohol behavior during economic recessions [9]. In the past treatment of the unemployed, nearly 51% had alcohol use problems [10], so it is possible that the number of alcohol addictions increased with unemployment during COVID-19, especially for those with pre-existing depressive disorders or mood disorders which are more likely to become dependent on alcohol. Those with alcohol use problems may also have their alcohol use problems exacerbated by unemployment or mandatory segregation policies, ultimately resulting in alcohol addiction.

3.2 Social Model

Regarding social factors, social learning theory suggests that those around them influence addictive behaviors. Especially for adolescents, observing addictive behaviors in their parents or peers is more likely to lead to their use of addictive substances. Not only are there behavioral influences, but attitudes toward addictive substances can also impact adolescents. The relationship between parental perceptions of alcohol consumption and early experiences of drinking problems is positive. According to studies, the most crucial reason for adolescents to drink alcohol is to socialize with friends and cope with feelings of tension and relieve stress by drinking alcohol [8]. With the increased rate of COVID-19 transmission worldwide, countries have introduced different levels of quarantine policies. During this pandemic, nearly 4 billion people lived in social isolation [11]. There is evidence that the pandemic increased the prevalence of PTSD symptoms and confusion, isolation, boredom, and anger during and after isolation [12].

Furthermore, reducing loneliness through alcohol may be preferred by adolescents. During isolation at home, adolescents have more contact with their families. After witnessing heavy parental alcohol use over an extended period, the adolescent or child may influence parental behaviors that lead to alcohol use, which will contribute to a future increase in alcohol addiction. Alcohol is also more readily available in Covid-19 from a substance availability perspective. According to studies, in some countries, excessive alcohol use rose after COVID-19. For example, almost 30% of subjects in Poland had excessive alcohol use, and 14% of subjects reported an increase in alcohol consumption after the COVID-19 epidemic [13]. Alcohol consumption also rose during COVID-19 due to its easy availability online and in stores, which may also account for the rise in alcohol addiction.

3.3 Biological Model

According to research related to biological models, biological and genetic predispositions may increase the risk of addictive substance use. Studies have shown that the risk of becoming a problem drinker is four times greater for male children of alcohol-addicted mothers compared to children of non-alcohol-addicted parents and three times greater for female children of alcohol-addicted mothers [8]. In the context of COVID-19, biological models may have little association with rising numbers of preaching addiction in the short term. However, as the number of alcohol addicts rises (both relapse and addiction), the probability of alcohol addiction passed on to children may rise.

4. Treatment

4.1 Pharmacological Treatment

4.1.1 Benzodiazepines

Before discussing the pharmacological treatment of alcohol addiction, it is essential to understand the biological and neurological content associated with alcohol addiction. The most significant feature of alcohol addiction is the loss of control over the use of alcohol, including the withdrawal response and tolerance. The prolonged use of alcohol causes maladaptive changes in neuronal mediators.

Alcohol withdrawal is most commonly characterized by a neurological overactivity that remains after cessation of alcohol use [14]. Withdrawal symptoms of alcohol addiction include anxiety, insomnia, seizures, and delirium tremens. Although some patients spontaneously reduce their alcohol use, some will still require clinical monitoring and medication. There are many options for the treatment of alcohol addiction. The most common drugs used to treat alcohol addiction are benzodiazepines. The action of benzodiazepines is to enhance the action of γ -aminobutyric acid neurotransmitters on γ -aminobutyric acid receptors to achieve withdrawal from alcohol addiction. According to studies, benzodiazepines are the only drugs that can reduce alcohol withdrawal syndrome and a reduced risk of withdrawal episodes and delirium tremens. However, there are still risks associated with benzodiazepines, namely that patients may abuse and overdose on benzodiazepines or even become dependent on them. Therefore, benzodiazepines should be clinically supervised, and the dosage of benzodiazepines should be strictly adhered to [15].

4.1.2 Naltrexone

The second drug is naltrexone, a mu-type opioid receptor antagonist whose mechanism of action is to reduce the rewarding effects of alcohol, that is, to reduce alcohol cravings. Naltrexone is an effective and safe drug based on research and analysis. The risk of overdose, the days of alcohol drinking, and γ -glutamyl transferase were clearly diminished with naltrexone. Another advantage of using naltrexone is the mild side effects, including sedation and gastrointestinal problems [16]. No significant drug dependence was observed with naltrexone compared to benzodiazepines.

In conclusion, naltrexone has demonstrated to be an efficient treatment to prevent relapse into severe alcohol abuse, with mild side effects. Conversely, strategies adopted in using naltrexone include continuous daily dosing or dosing based on episodes of alcohol addiction. The second approach is practical for heavy, problem drinkers and alcohol-dependent individuals [17].

4.2 Non-Pharmacological Treatment

4.2.1 Cognitive behavioral therapy (CBT)

Cognitive behavioral therapy (CBT) treatment is one of the most effective interventions for alcohol addiction treatment addresses cognitive and emotional situational triggers and provides specific skills training to cope with alternative programs. CBT treatment strategies for alcohol addiction typically include:

- a. Identifying individual triggers (relapse).
- b. Skills to cope with the trigger (relapse).
- c. Skills training for substance refusal.
- d. A functional evaluation of alcohol utilization
- e. Add activities not associated with alcohol.

Cognitive behavioral therapy can intervene for alcohol use disorders and co-occurring symptoms of alcohol addiction or depression that trigger alcohol addiction. According to feedback from participants in cognitive behavioral therapy, participants felt an increase in self-efficacy. They had increased confidence, The ability to share past experiences with others in group activities, and the ability to cope with their negative thoughts [18]. This is consistent with the results of another study, which showed that participants' increased self-confidence allowed for self-motivation and had a positive therapeutic effect on alcohol addiction and the co-occurring disorders caused by alcohol addiction [19]. Based on the above study, it was concluded that CBT could effectively treat depression-induced alcohol disorders and co-occurring disorders caused by alcohol disorders by strengthening the self-confidence and self-efficacy of the visitors. During COVID-19, alcohol addiction due to unemployment, segregation policies, and other factors met the treatment criteria for CBT. However, due to segregation policies, many settings restrict or reduce people's ability to congregate, making it challenging to conduct cognitive behavioral therapy face-to-face or in small groups.

4.2.2 Deep Brain Stimulation Surgery (DBS)

Cognitive behavioral therapy is a conservative treatment approach. However, after cognitive behavioral therapy is administered, patients continue to experience the pain of alcohol addiction and the mental and social activities that are affected by alcohol addiction. DBS is an alternative treatment that can help patients who have experienced prolonged treatment without significant results. According to research, participants in clinical studies of DBS have experienced prolonged and ineffective treatment. Although the number of participants in the study was only five, four participants in the clinical study had resolved their alcohol addiction-related unemployment problems, and no significant side effects were observed. Only one participant reported mild manic symptoms [20]. DBS can help treat patients who are chronically affected by alcohol addiction and who may have been involved in pharmacological or other non-pharmacological treatments that were not effective. In the context of COVID-19, it is a treatment option that can be tried for people who want to treat alcohol addiction in the short term.

4.2.3 Online therapy

Today, with the rapid development of the Internet, people are in contact with the Internet every day, from socializing to entertainment activities. Along with the development of the Internet, it has also brought convenience to conducting psychological counseling and treatment, and the use of the Internet for remote psychotherapy is a growing market. Particularly during the COVID-19 period, participating in therapy at home via the Internet became a viable treatment option due to segregation policies and reduced foot traffic in public areas. However, there is still controversy about remote treatment via the Internet, especially regarding ethical debates. According to the study, the main points of contention contain five areas, and the arguments in favor of conducting online therapy include.

- a. increasing the selectivity of psychotherapy and services
- b. Increased communication between the parties
- c. increased accessibility of services
- d. Increased access to necessary psychotherapy for diverse populations.
- e. increased patient satisfaction

Contrary arguments against online treatment include.

- a. privacy protection for patients with alcohol addiction
- b. whether online therapists need to pass specialized training
- c. whether communication via the Internet can lead to errors in communicating information
- d. how to intervene in emergencies for alcohol-addicted patients
- e. whether there are regulatory and legal issues [21].

5. Limitation and Future Direction

Treatment for alcohol addiction is currently not without its drawbacks. Both pharmacological and non-pharmacological treatments have advantages and disadvantages. The disadvantages of these treatment options cannot be ignored to explore the most optimal treatment options for alcohol-addicted patients. In the future, there is a need to continue developing new medications for the treatment of alcohol addiction to reduce side effects and address the problems that can cause dependence on drugs.

For CBT therapy in the context of COVID-19 online treatment has been proposed due to the development of the internet. Online therapy can effectively address the limitations associated with physical contact due to mass disease outbreaks. In the future, it will be more important to focus on online therapy's effectiveness and regulate its ethical and legal aspects.

More clinical research data are needed for future DBS treatment options. A central problem that other research should resolve is whether the nucleus accumbens represents a generic site for DBS for

addiction treatment or whether various categories of substance dependence require separate target stimulation [22].

6. Summary

Alcohol addiction has become an essential category of substance addiction disorders of worldwide concern. Alcohol addiction is harmful to individuals and society in terms of the burden it places on the body's functioning organs and the violence and impulsive behaviors it causes. The rise in alcohol addiction has not been explained in the past by the inclusion of global harm events such as COVID-19. Therefore, in the context of COVID-19, this article explains the rise in alcohol addicts (including new additions and relapses) through a biosocial-psychological model. It also predicts that the number of alcohol addicts may continue to increase due to the hereditary nature of alcohol addiction. Today, while COVID-19 still exists, it is essential to find a treatment to help alcohol addiction and explore the reasons for the rise in the number of alcohol addicts. In addition to known medications, behavioral treatments (CBT), and Deep Brain Stimulation Surgery, with the growth of the Internet and the restrictions of segregation policies, remote internet treatments are now more widely known.

The significance of this review of past data and biopsychosocial models is to increase awareness of the dangers of alcohol addiction and to help people understand how to treat alcohol addiction effectively. For public health, the necessary implication of this article is to be alert to the subsequent rise in alcohol addiction resulting from a global health security event like COVID-19.

More research on treatment options for alcohol addiction in the context of COVID-19 is still needed in the future. One option that needs to be studied more in the future is remote online treatment. Remote treatment has the advantage of being able to communicate with and seek help from therapists across the country or even the world from the comfort of one's own home, and it can reduce the spread of COVID-19 while in treatment because one does not have to leave home. For infectious diseases, remote treatment via the Internet is a reasonable and safe option. However, there are still drawbacks to remote web-based treatment. Issues such as the effectiveness of remote online treatment, the privacy and security of patients, and the therapist's treatment techniques and protocols still need to be studied.

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