Causes and Treatments of Alcohol Addiction among Adolescents

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Abstract. Alcohol addiction is one of the most serious problems around the world and accounts for personal death and disability. The paper reviews serval studies in recent years about the causes and treatment of alcohol addiction among adolescents, and focuses on adolescents aged 9-19 years. Alcohol addiction inflicts damage on problematic and irreversible consequences such as decline in attention and decrement of intellectual function. This is especially the case for adolescents, who is one of the most vulnerable groups in society. For youth adults, there are several reasons for becoming alcohol addiction ranging from internal factors including genetic predisposition and specific types of personality to external factors which refer to environmental effects. Currently available treatments will be introduced from different perspectives followed by general education could be provided by family, school and community. This paper exposes the causes of alcohol addiction from various aspects, which can provide a reliable reference for further intervention research. Implications of the findings will be discussed in terms of the different parenting styles and the benefit of treating adolescents' alcohol addiction and future development. Future research could further consider the cultural differences and comprehensive therapies in order to see more implications.

Keywords: Alcohol Use Disorder; Adolescent; Alcohol Addiction.

1. Introduction

Alcohol is frequently used in social situations. However, alcohol addiction would cause serious problems and it represents one of the most widespread addictions. Because of alcohol addiction, individuals lost their ability and energy to function normally to complete their job duties. For instance, drunk journalists are not able to report news calmly, drunk drivers are prone to traffic accidents, and drunk doctors cannot hold scalpel steadily. This is especially the case for people with high-risk occupations, whose small mistakes might cause serious consequences. Nevertheless, it is not only a problem among adults but also adolescents. As one of the most vulnerable groups in the world, adolescents are also considered as the future of one country, determining the future economic and social development of a country. To become a responsible person, adolescence occupies an integral role in life and it is more significant than ever for human development [1]. For adolescents, abuse using alcohol might bring them relatively long-term negative consequences. Alcohol addiction poses a threat to cognitive disadvantages, including reduced visuospatial processing and memory [2], intellectual functions, academic performance, processing speed, and sustained attention [3].

Alcohol addiction, which combined with alcohol dependence (AD), are also officially known as Alcohol Use Disorders (AUDs), is a progressive mental disorder with high prevalence in the general population [4]. Compared to adults, adolescents' alcohol intake is restricted for several reasons. On one hand, youth information-seeking approaches are mostly through social media due to the rise of social media, not well-developed adolescents are able to expose to a large amount of unprocessed information, they realized that those adults look forward to their leisure time with alcohol after they end their works, which imperceptibly results in the belief that drinking alcohol with peers is not also acceptable behavior but also an indispensable component in maintaining their friendship and good times. Alcohol addiction is problematic for underage youths since they might spend exorbitant time and attention on entertainment instead of learning, which is destructive for their further development. On the other hand, the adolescent period and high level of curiosity usually go hand in hand, although it is a positive motivator that drives them to explore and discover, their lack of self-regulation would

lead to permanent brain damage, which is related to the memory problems mentioned above, inability to learn and problems with verbal skills, which indirectly results in poor academic performance. According to previous literature review [5], it is found that related research about alcohol addiction among adolescents are inadequate. Since the consequences brought by adolescents to the society are not as serious as adults, and their personalities are also not well-developed, the factors affecting adolescents to become alcohol addiction are not seriously considered as determined components of their problematic behaviors. Since alcohol addiction involves multifactorial sitology, multidisciplinary treatment with combining pharmacologic and psychological interventions will be applied. For the pharmacologic interventions, medicines such as disulfiram, acamprosate, and naltrexone are used, while lots of psychological treatments are developed for adolescents' alcohol addiction in recent years including cognitive-behavioral therapy, family therapy. More and more studies are being conducted to investigate better treatment plans for adolescent substance abusers such as Integrated Family and Cognitive-Behavioral Therapy.

This paper aims to review the paper with the causes and treatments available for adolescents with alcohol addiction. This subsequent paper would be finished with the division of four parts. Firstly, the general definition and negative impact of alcohol addiction among teenagers will be introduced. Next, the paper will specify the causal framework from internal factors and external factors. In addition, available medical and non-medical treatments will be found for alcohol addiction. Last but not least, the last part of this paper will discuss some general guidances for families, schools and communities about reducing adolescents' problematic drinking behavior.

2. Adolescent Alcohol Addiction

2.1 Definition

Alcohol addiction, which is clinically called alcohol use disorder (AUD), comprised alcohol abuse and alcohol dependence. Adolescents aged from 9-19 will be targeted in this paper and the diagnosis of alcohol addiction for adolescents are same as the diagnosis in DSM-V. A clinical diagnosis of alcohol addiction is currently made on the basis of diagnostic criteria that are standardized across addictive disorders by the DSM-V, which is defined as a pathologic condition manifested by 11 criteria. According to the definition given by American Psychiatric Association [4], individuals who meet any 2 of the 11 criteria during the same 12-month period would be diagnosed as alcohol use disorder, and the severity of the AUD depends on the number of presence of symptoms.

2.2 Negative Impacts

Such abuse of alcohol brings in its wake health-related problems and accidents. According to Horton [6], alcohol addiction inflicts damage on thousands of death and injury in traffic accidents, physical and mental disability, millions of dollars lost in productivity every year, deteriorating response, confrontational and disruptive behavior leading to problems with intimate's family members and friends, and personal financial loss as well. Adolescents, the most sensitive population in terms of tendencies, peer pressure, and identity, are vulnerable to alcohol abuse. Such vulnerability brings in its wake negative impacts including decreased academic performance, increased legal troubles, increased risky sexual behavior, and higher risk for alcohol abuse [7].

3. Causes

3.1 Internal Factors

Some individuals are born to be vulnerable due to their genetic predisposition and specific types of personality. Although their gene would not play a determining role in being alcoholism, they indeed have a higher chance to become alcohol addiction when they are exposed to the same level of stressful environment as others.

3.1.1 Genetic predisposition and alcohol addiction

In terms of the internal influence factors of being alcoholism, genetic predisposition is a driving force behind alcohol addiction. The classic studies of Swedish adoptees provide strong evidence that biological inheritance is a main culprit in the development of alcohol use disorder [8]. Dysfunction in the brain reward cascade might be caused by certain genetic variants (polygenes), especially the low dopaminergic features in the dopamine (DA) system, such kind of people's brains need DA fixation to ensure the regular body function, including pleasurable feeling, motivation, memory and movement. This trait leads to multiple drug-seeking behavior which is called "reward deficiency syndrome" [9]. This hypothesis is useful in explaining the two types of genetic predisposition which are type I or Milieu-Limited Alcoholism, and type II or Male-Limited Alcoholism. Type I is the more common one which occurs in both males and females and requires both genetic predisposition and the effect of environmental stressors. Type II is relatively less common and is found only in men. According to Schuckit et al. [10], males with alcoholic parents are 9 times likely to become alcoholics, which are unaffected by the environment. For these two types of adolescents, this susceptibility is partly due to inheritance.

3.1.2 Personality and alcohol addiction

Another major internal influence factor is considered to be the type of personality. As proposed by Eysenck [11], certain personality traits are prominent vulnerability factors for addiction. Many people took up smoke during the stress period and had no difficulty in giving it up after a certain period or at least controlling their intake. However, "addictive" people remain wedded to their addiction in spirit of changing circumstances. Eysenck also indicated that two dimensions appear to be relevant to the aetiology of alcohol addiction which are psychoticism and neuroticism. Patients tend to have higher psychoticism and neuroticism scores compared to people without alcohol addiction. In the recent study conducted by Hakulinen et al. [12], extroverts who are low on conscientiousness have the relatively high and increasing risk in alcohol consumption. Meanwhile, high agreeableness and low openness predispose individuals to reduce alcohol consumption and preferring abstinence. It might be not only because people with low openness are relatively afraid to try new things and are relatively stubborn about things. Their curiosity about drinking is overridden by their conservatism, which dramatically reduce their risk to be alcohol addiction.

3.2 External Factors

It is clear that the above internal factors, which partly explain the aetiology of alcohol addiction, cannot account for individual differences in the risk of alcohol addiction individually. Apart from genetic susceptibility and personality traits, environmental influence takes an irreplaceable role of becoming alcoholics.

3.2.1 Provocative environment experiences and alcohol addiction

Although alcoholism might be relatively unusual compared to other behavioral disorders in family, environment contributed more to alcoholism risk since adolescents would imitate their parents or elder brother's behaviors and develop attitudes towards alcohol in the family. Studies from a research group demonstrated that individuals who reared in adoptive families with alcoholic members are at significantly increased risk for alcohol addiction [13].

In addition, the diathesis-stress model further illustrates that the existence of behavioral disorders is not only because of inherited predisposition but also due to the exposure of a provocative environment which refers to stress. For adolescents, they are more susceptible to social stressors and traumatic life events, and exposure to these pressures can significantly increase their risk of alcohol addiction [14]. For instance, unhappy family life, childhood sexual abuse, and even academic pressure are associated with alcohol addiction during adolescence.

3.2.2 Social culture and alcohol addiction

Although adolescents experience similar stressful academic pressure and live in similar environment, it is clear to find that adolescents have different performances in different social contexts toward alcohol addiction. The explanatory model of adolescent problem behavior [15] was raised to compare the adolescents' performances between China and the United States, which represent two kinds of cultures. On one hand, as China is a synonym of harmony, modesty, and restraint, Chinese teenagers also tend to behave well and follow rules in order to receive the praise from their parents and teachers. Also, Chinese parents spend more effort to protect their children and prevent them from making mistakes, therefore, their availability of alcohol at home would tend to be lower. On the other hand, the US is always considered to be the symbol of freedom, teenagers from the US would be less likely to be punished due to alcohol consumption. Besides, American parents tend to give their children more space to explore the world without much restriction. Available data indicate a lower prevalence of alcohol abuse in China than in the United States [16]. True, apart from parental protection and related reinforcement or punishment, social acceptance which includes friends' disapproval, social atmosphere, etc. would also influence adolescents' choice towards alcohol. The risk of alcohol addiction in society that limits underage youths' purchase of alcohol would definitely be lower than in a society that treats it as a normal drink instead of a drug.

4. Treatments

4.1 Medical Treatment

Since alcohol addiction implicates varied neurotransmitters and their receptors in brains, which includes dopamine, serotonin, opioid peptides, glutamate, and GABA, current treatments for alcohol addiction are directed at the aforementioned neurotransmitter systems. There are medications approved for the maintenance of alcohol addiction and they are disulfiram, naltrexone, and acamprosate [17]. Disulfiram is an Antabuse, which is also known as an aversive agent. Those who take disulfiram will experience extremely uncomfortable hangout symptoms immediately such as nausea, vomiting, swearing, hypotension and tachycardia after drinking alcohol because Disulfiram inhibits aldehyde dehydrogenase (ALDH) which prevents the elimination of acetaldehyde that causes hangover symptoms. Although disulfiram is the only medication for treating alcoholic patients in the recent forty years, its aversive reaction results in lower rate of treatment compliance. By contrast, Naltrexone is the less favorable option for treating alcohol addiction due to its lack of agonistic effects which also reduce compliance. Naltrexone as an opioid antagonist can block the effects of endorphins and opioids which cause euphoria among individuals with alcohol addiction. The major function of naltrexone, blocking the euphoric feeling, is proven to be effective in reducing the risk of relapse and alcohol abuse, and also alleviating carving. Besides, extended-release naltrexone effectively tackles the adherence problem compared to oral medicine. Acamprosate is the third FDA-approved medication for the treatment of alcohol addiction, following in the steps of disulfiram and naltrexone [18]. It directly inhibits the intensity of alcohol withdrawal such as sleep and mood instabilities to reduce the risk of relapse by acting on GABA and the glutamate system.

4.2 Non-medical Treatments

4.2.1 Cognitive Behavior Therapy

Cognitive Behavior Therapy (CBT) is considered to be an efficient intervention for alcohol addiction in reducing drinking in randomized clinical trials [5] with harm reduction is the main objective of the CBT sessions. The adolescent-focused CBT concentrate on eliciting adolescent's problems and providing essential skills training, which includes 8 aspects with cognition development and behavior development [19]. For the cognition development, information and education offering, contingency contracting, and identifying cognitive distortions. Information and education offering occurs everywhere in the family which is the best way for adolescents to gain knowledge of the world

without being hurt. Adolescents can be able to understand the risky consequences of alcohol addiction after receiving education from parents. Contingency contracting is an intervention with several components, including premise, assume and results. Premise refers to the required behavior in this contract, assume can be explained as the conditions under which the behavior should occur, and result is the consequence for both achieving the goal and failing to perform to a criterion. For instance, parents and their child can enter into a contingency contract to ensure their child perform well such as control their alcohol intake, after which, the child can be rewarded. Such contingency contracting can reinforce teenagers to develop healthy habits and especially maintain their alcohol abstinence in this case. Besides, identifying cognitive distortions as a powerful psychology tool in CBT, by identifying and understanding adolescents' cognitive distortions, they can make the judgement of their behaviors. For the behavior development, therapist would provide problem-solving training, communication skills training, self-monitoring, increasing healthy recreational activities, and homework assignments. Problem-solving skills and communication skills training are not only the skills for treating substance addiction but also the essential skills for both personal life such as avoiding conflicts compromise and career life such as future job-hunting. For alcohol addiction, problem solving training, communication skills training gives patients a sense of control over their behavior and even their lives, which is beneficial in the first place mentally to reduce their alcohol intake, as many people want to use alcohol to relieve the stress in their lives and studies. Besides, they will be able to solve their "alcohol addiction" problem after the professional training by themselves. Self-monitoring is an important and long-term trait which refers to an ability to regulate behavior to various social situations. Since adolescents spend more time with their friends, teachers and people in the society, whether they can regulate themselves to resist the temptation is the key on treating alcohol addiction and resisting relapse. Healthy recreational activities, whether it is cycling, swimming, hiking, is conducive to physical fitness and increase healthy recreational activities is an essential component in treating alcohol addiction through CBT. Those recreational activities could stimulate the release of some neurotransmitters and therefore ensure the balance of hormones. Last but not least, homework assignments are used for behavior reinforcement and generalization. Patients might be required to apply the skills they learnt from therapists in their daily life, and therapists can use this chance to evaluate patients progress. These steps are conducive to treat alcohol patients. Morgenstern and Longabaugh [5] review a series of studies and indicate that CBT can increase cognitive and behavioral coping skills, although the mechanism behind the effect is not yet confirmed.

4.2.2 Family therapy

Since the environment takes an indispensable part in becoming alcohol addiction among teenagers, restrictions and education from family would play a key role in treating adolescents' alcohol addiction. Family Therapy is, therefore, also one of the most effective approaches.

Multidimensional family therapy (MDFT) is used for treating adolescent drug abuse and related behavioral problems [20]. Joint effect from the adolescent domain and parent domain of MDFT help parents and teens engage in their family events for reducing problematic behaviors through effective communication and monitoring. From the perspective of adolescent, they are able to develop coping and emotional regulation, and effective communication and interaction skills with parents and other adults. From the perspective of parents, they are required to engage in their children's behavioral and emotion life and improve their parenting skills such as monitoring as well.

5. General Education

In order to prevent the occurrence of alcohol addiction among adolescents, reducing exposure to addictive alcohol and implementing preventive strategies at the level of family, school, and community are conducive to adolescents' further development [21]. From the perspective of family, improving family bonding, cohesion, communication, and appropriate parental supervision are the key to ensuring adolescents are on the right path. From the perspective of school, they have the responsibility to provide their students with normative education and train their social resistance skills

and adaptive approaches to tackle the sociocultural and environmental pressure. By doing these, adolescents are able to learn active coping, problem-solving skills and proper social methods through a reliable and safe environment instead of learning that information by themselves. In addition, public education is essential in protecting the youth, especially for the alcohol use problem. The community could fully utilize the resource and provide community-based events such as holding life skill training programs, good behavior games, and unplugged programs with the assistance of social workers. In fact, joint efforts from family, school and community are required for reducing alcohol addiction.

6. Summary

This paper discussed the causes of becoming alcohol addiction with internal factors including genetic predisposition and personality, and external factors with provocative environment experiences and social culture. For the treatment, two theoretically and operationally different therapies were mentioned for adolescent substance abuse which are the family-focused MDFT and the individually focused CBT. For this paper, it not only provides a comprehensive explanation of the causes and available treatments for the youth, but also for parents and other caregivers, in the hope that these can become a positive guidance to form good habits and treat problematic behavior especially drug addiction. Study limitations should be acknowledged. First of all, the results of most research are based on self-report data which might be the relatively most correct data but since underage youth alcohol consumption is not encouraged in lots of countries, social desirability bias might occur in self-reported questionnaire results. Secondly, in terms of the treatment in family therapy, participants who are willing to receive the therapy tend to be parents that are willing to spend time with their children and open to change. Therefore, the effectiveness might be affected. In the future, more related studies could be conducted to investigate specific culture-based alcohol addiction problems with different applicable therapies, and researchers should adopt quota sampling to identify participants with various parenting styles.

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