

The Biopsychosocial Model of Addiction

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BIOPSYCHOSOCIAL VS. BIOMEDICAL MODELS OF ADDICTION

The biopsychosocial model of addiction posits that biological/genetic, psychological, and sociocultural factors contribute to substance use and all must be taken into consideration in prevention and treatment efforts. This model emerged in response to criticisms of the biomedical model, which has historically dominated the field of addiction studies. The traditional biomedical model was developed and is espoused by medical scientists for the study of disease, and its proponents also view addiction as a chronically relapsing brain disease with a genetic/biochemical cause. The biomedical or disease model of addiction views addiction as the manifestation of disturbances in measurable biochemical or neurophysiological processes in the afflicted individual.

Contemporary medical disease models acknowledge the influence of social, psychological, and behavioral dimensions of addiction; however, these dimensions are viewed as relatively less important in the etiology and treatment of addiction. The medical disease model favors reductionism, whereby underlying biomedical causes for addiction are primarily implicated in the etiology/cause of the disorder, and mind-body dualism, where the mind and the body are viewed as separate and as not significantly affecting one another. Despite widespread favor among many scientists and healthcare practitioners, evidence from research studies of addictive behaviors does not support the medical disease model of addiction; instead, a biopsychosocial model that gives equal importance to biological/genetic, psychological, and sociocultural factors better fits the available data.

In 1977, psychiatrist George Engel authored a seminal paper calling for the abandonment of the biomedical model of illness in favor of a biopsychosocial model. Engel identified numerous problems with the biomedical model that would be alleviated by the adoption of a biopsychosocial model that recognizes biological, psychological, social, and cultural influences on illness. For example, the biomedical model views biochemical abnormalities as the cause of any illness, and posits that correcting the biochemical abnormality will cure the illness. However, in many disorders, a person may remain ill after the biochemical abnormality has been corrected and, conversely, a person may never become ill even in the presence of an abnormality. For example, when infected with the virus that causes the common cold, some research participants become ill and some do not. The biomedical model does not account for the finding that, among people with similar genetic predispositions or physiological problems, some people develop an illness while others remain well. Engel surmised that psychological and sociocultural factors must explain the differences in the disease state among people with the same biochemical abnormalities.

It has been well established that illness is not merely the result of biochemical dysfunction or abnormality, as some people become ill in the absence of an abnormality or dysfunction. The effects of stress on illness have been well supported in the literature, as has the role of expectation on illness and health. The placebo effect, where an inert ingredient can result in biochemical reactions for the person who believes he or she is ingesting a drug, is evidence for the role of expectation in illness, and supports Engel's view of a connected mind-body experience. There also is evidence for the importance of the patient-provider relationship in healing; if psychosocial variables were not important, it would not make sense for rapport building and communication between the physician and the patient to have such strong influences on health outcomes. Moreover, if illness is caused only by the existence of a physical abnormality, then it should be cured by correcting the deviance, but this is not always the case. Most illnesses, disorders, and syndromes, including disorders of addiction, are caused by the interaction of numerous factors – biological, psychological, social, cultural, cognitive, and environmental. Therefore, these factors must be addressed in order to result in a recovered state.

CONCEPTUAL MODELS OF ADDICTIVE BEHAVIOR

A discussion of helping and coping by Brickman and colleagues identified four models of addiction based on beliefs about attributions of responsibility for acquiring

the addictive problem and the responsibility for solving the addictive problem. The moral model holds that people who suffer from problems of addiction are responsible for both acquiring and solving the problem. People who become addicted are seen as morally weak with poor willpower, and they must will their way through addiction in order to recover. There is little support for this model in the literature. The enlightenment model holds that the person is responsible for developing the addiction, but is not responsible for solving the problem. The enlightenment model is espoused by Alcoholics Anonymous and other 12-step philosophies, and requires people to seek recovery by turning the problem over to a higher power. Only a higher power can cure addiction, and it is the person's task to form and strengthen a relationship with a spiritual entity so that this entity can solve the addiction problem. The medical/disease model emerged in response to the moral and enlightenment models that placed blame on the addict for his or her problem. In the medical model, the addict is responsible neither for the development of the problem nor for its resolution. This model posits a biological/genetic predisposition for addiction, an underlying disease process, and assumes that the disease is progressive. The medical/disease model fails to account for the finding that many people with problems of addiction do recover without professional treatment. Finally, the compensatory model holds that people are not responsible for developing the addictive problem, but are responsible for their own recovery. In the compensatory model, the role of multiple factors in the development of addictive behavior is noted (including biological predisposition, early experiences, and social and cultural variables), and the continued use of substances is viewed as a way to cope with stress. Of these four models, the compensatory model is the most similar to the biopsychosocial model.

BIOPSYCHOSOCIAL MODEL OF ADDICTION

Science has not discovered a single factor that can explain why some people are able to use substances without progressing to addiction, while others abuse or become dependent on substances. Instead, the available evidence suggests that biological, genetic, personality, psychological, cognitive, social, cultural, and environmental factors interact to produce the substance use disorder, and multiple factors must be addressed in prevention and treatment programs. The interaction of these factors to produce substance use problems is the core tenet of the biopsychosocial model of addiction. This model is a way to understand and explain the problem of addiction, but has not generated testable

hypotheses as have theories of behavior change like the Health Belief Model or the Theory of Reasoned Action/Theory of Planned Behavior (TRA/TPB). The essence of the model is that the mind and the body are connected and both the mind and the body affect the development and the progression of addiction within a social and cultural context. Only by considering all of these factors can addiction be accurately conceptualized.

BIOLOGICAL FACTORS AND THE DEVELOPMENT OF ADDICTIVE BEHAVIORS

Given the right environment, biological and genetic predispositions may increase the risk of substance use problems. Adoption and twin studies have found that substance abuse is to some extent heritable. Male children of an alcohol-dependent parent have four times the risk of becoming problem drinkers compared with the children of nondependent parents, while female children of alcohol-dependent mothers evidence a three-fold greater risk. It has been reported that 30.8% of people with alcohol dependence had at least one alcohol-dependent parent. Among adults with alcohol dependence, 27% have alcohol-dependent fathers and 4.9% have alcohol-dependent mothers, compared with alcohol dependence among 5.2% of fathers and 1.2% of mothers of people without alcohol dependence. Among twin pairs in which one twin was diagnosed with alcohol dependence, there is a significant difference in the proband concordance rate among monozygotic (54.2%) and dizygotic twins (31.5%). Calculated heritability ranges from 40–90% across studies, with more chronic and severe forms of alcohol dependence showing greater estimates of heritability. However, it is important to note that someone with a strong genetic predisposition to addiction still needs to engage in substance use before the addictive behavior becomes manifest.

Once alcohol is consumed, however, children of an alcohol-dependent parent experience the effects of alcohol differently than the children of nondependent parents. For example, research on subjective experiences of alcohol intoxication and body sway while intoxicated found that sons of an alcohol-dependent parent respond less intensely to moderate doses of alcohol. When given the same amount of alcohol as controls, sons of an alcohol-dependent parent had less body sway and were less likely to report feeling intoxicated. Follow-up studies have found that decreased subjective intoxication predicted later development of alcohol use disorders. Other studies have found that the children of an alcohol-dependent parent are less sensitive to the negative consequences of alcohol, resulting in increased alcohol

consumption. Further, sons of an alcohol-dependent parent have decreased EEG alpha rhythms, also found in people with current alcohol dependence. Other studies have found that the sons of an alcohol-dependent parent have lower language functioning, lower learning achievement, lower verbal intelligence, and other neuropsychological differences when compared to controls. There is evidence that children of an alcohol-dependent parent who become alcohol dependent themselves have a worse prognosis than alcohol-dependent people who are not the children of alcohol-dependent parents. For example, the children of an alcohol-dependent parent show symptoms of alcohol problems earlier, have greater physical dependency on alcohol, and report less control over their drinking.

A genetic predisposition toward addiction does not influence the substance of choice to which a person may become addicted; instead, it is associated with an increased propensity toward addictive behavior in general. It also is important to note that genetic factors may be protective against alcohol use disorders. People of Asian descent are more likely to lack one isozyme of a liver enzyme known as alcohol dehydrogenase that aids in the metabolism of alcohol in the liver. People with this genetic variation have a flushing reaction to alcohol, characterized by flushed, reddish skin, and are much less likely to ever develop alcohol problems.

Research from the fields of genetics and biochemistry has identified other biological risk factors for addiction. People with impulse control disorders, including people with substance abuse problems and gamblers, are statistically more likely to have the dopamine D2A1 gene than controls. This genetic polymorphism is associated with reduced D2 receptor density and deficits in the dopaminergic reward pathway. Research has found that those with low D2 receptor density are more likely to seek out pleasurable activities including alcohol use, drug use, and gambling. This may translate into increased likelihood of experiencing problems associated with addictive behaviors.

Further evidence of the heritability of the risk for alcohol dependence can be found in animal studies. Researchers have been able to use selective breeding to develop strains of rats that differ in their liking of alcohol. One strain of rat (C57BL/6) has been bred to prefer alcohol over water. These animals seek out alcohol, ingest it willingly, engage in efforts to get alcohol, and become physically dependent on it, showing signs of tolerance and withdrawal. Other strains of rats have been bred to self-administer other drugs of abuse at high rates. The fact that an alcohol-preferring strain of rat has been developed is strong evidence of the influence of heritability on alcohol use behavior. Furthermore, studies have found deficits in serotonin in particular brain regions of rats that have

been bred to like alcohol. Despite the strong evidence of the role of genetic influence on alcohol use behavior, biology is still insufficient to account for the entirety of the problem. There still remain cases where people with no known genetic risk become addicted and cases where people with great genetic risk do not. The biopsychosocial model of addiction acknowledges that psychosocial variables also are needed to explain these occurrences and that these variables may interact with genetic and biological risks to cause addiction.

PSYCHOSOCIAL FACTORS AND THE DEVELOPMENT OF ADDICTIVE BEHAVIORS

Researchers have discovered consistent predictors of drug use initiation and subsequent use across multiple substances of abuse, including personality variables, learning factors, and higher-order cognitive processes. Substance abuse is highly comorbid with affective disorders and other psychiatric diagnoses, although some psychiatric problems (e.g. depression and anxiety) may be effects of the substance use as well as causal factors. Many (but not all) substance abusers have a history of antisocial behavior, nonconformity, deviance, acting out, impulsivity, and low self-esteem; however, these also can be the effects of substance misuse. Research establishing the role of psychosocial factors in the development of addictive behaviors provides evidence that addiction is a multifactorial problem, not a disease solely caused by a measureable underlying physiological abnormality or deficit, and provides support for the biopsychosocial model of addiction.

Risk Factors in Children

Much research has been conducted on childhood variables that increase the risk for alcohol dependence and substance use disorders. Consistently found in the literature is evidence for an increased likelihood of addiction among children who are victims of abuse and who exhibit externalizing behaviors such as those seen in conduct disorder, attention deficit/hyperactivity disorder, and oppositional defiance. In particular, antisocial and deviant behaviors such as aggression, hostility, vandalism, sadistic behavior, rebelliousness, and association with deviant peer groups place one at risk for substance use disorders later in life. One study found that problem drinkers exhibited more externalizing behaviors in childhood than did moderate drinkers, and moderate drinkers exhibited more of these behaviors than did light drinkers. Other research has found that tolerance of deviance in adolescence is a strong predictor of alcohol and other substance abuse

in adulthood. Antisocial personality disorder is highly comorbid with substance abuse and dependence, and antisocial behaviors in childhood are strong predictors of substance problems in adulthood, independent of a family history of substance abuse.

Personality and Temperament

Addictive behaviors result from the interaction between genetic predisposition and psychosocial variables, including personality and temperament. Personality variables that impact later substance use include high novelty/sensation seeking, low harm avoidance, negative affectivity, and reward dependence. Other temperament variables that predict later substance problems are low attention capacity, high emotionality, low sociability, and impulsivity. A difficult temperament in childhood – defined as a high activity level, low flexibility, low task orientation, mood instability, and social withdrawal – has been shown to predict substance abuse in adolescence. One research study found that a difficult temperament in childhood was a stronger predictor of later alcohol dependence than a family history of alcohol dependence. Regarding the Big Five factors of personality (neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness), a family history of alcohol dependence is positively associated with openness to experience and negatively associated with agreeableness and conscientiousness. Unconventionality and deviant behavior are strong predictors of substance abuse across multiple research studies. In addition to increasing risk for substance use, temperament may influence adolescents' decisions when forming peer groups, which may then directly impact substance use. Adolescents who are more deviant and less conventional tend to select peers who also are more deviant and less conventional, further enhancing their risk for substance abuse.

Classical and Operant Conditioning

Classical and operant conditioning are learning processes that affect animal behavior, including addictive behaviors among humans. Classical conditioning works to establish a link between reflexive, involuntary behaviors and antecedent conditions, whereas operant conditioning concerns the modification of voluntary behavior in response to its consequences. In classical conditioning, an unconditioned stimulus (US) is paired with a conditioned stimulus (CS), resulting in a conditioned behavioral response (CR) to the conditioned stimulus. For example, Pavlov's dogs learned to associate the sound of a bell (the CS) with food (the US) to produce salivation (the CR). After several pairings of the bell with food, the bell itself became sufficiently linked

with food to produce salivation even in the absence of food. Among people engaging in addictive behaviors, an unconditioned stimulus (e.g., drug paraphernalia) can become paired with a conditioned stimulus (the drug) to produce a conditioned response (psychomotor stimulation). People (such as an addict's drug-using social network), places (such as locations where drugs are purchased or used), and things (such as drug paraphernalia, alcohol bottles, or substance-related words) are linked to the unconditioned stimulus (the substance) and take on the role of conditioned stimulus, evoking a conditioned response (e.g., craving). Encountering the conditioned stimuli associated with substance use (i.e., triggers) is a strong precipitant of relapse among people in recovery from substance use disorders.

In operant conditioning, behavior is reinforced via punishment, positive reinforcement (reward), or negative reinforcement (the removal of an adverse consequence). Reinforcement is any consequence that increases or decreases the likelihood that a behavior will be repeated. Among people engaging in addictive behaviors, operant conditioning affects the probability that the behavior will recur. For example, smoking behavior may be positively reinforced by pleasurable sensations caused by nicotine and simultaneously negatively reinforced by the elimination of nicotine cravings. All drugs of abuse act on the central nervous system and initially produce pleasant feelings and a hedonic state, but people differ in how reinforcing they find these feelings to be. People who enjoy the sensations produced by substance intoxication (i.e., find intoxication to be positively reinforcing) are more likely to use substances to the point of intoxication again in the future than are people who do not enjoy the feeling of intoxication. One study found that the degree of perceived reinforcement following initiation of drug use was predictive of the magnitude of the resultant drug problem.

Classical and operant conditioning work together to produce a behavior chain, or a sequence of behavior that can be understood in terms of both its antecedents (classical conditioning) and consequences (operant conditioning). Antecedents are also known as cues. Once a behavior chain has been activated, each cue serves as the reinforcer of the behavior that occurred previously as well as the antecedent of the behavior that follows. Cued habitual behaviors are both classically conditioned and reinforced or punished via operant conditioning. For example, encountering a liquor store may serve as a classically conditioned cue for a problem drinker, which results in craving. Craving may then serve as a cue to consume alcohol, and this behavior may then be negatively reinforced by alleviating stress or negative mood. By determining and understanding the behavior chain involved in addictive behaviors, intervention can be aimed at breaking the classically

conditioned link between a cue and the behavior, by altering the reinforcement for the behavior, or both.

Substance use functions as positive reinforcement when the pleasant effects of intoxication are interpreted as rewarding to an individual. At the same time, people use substances to cope with unpleasant emotions, to manage stress, and to alleviate negative symptoms of withdrawal. In these ways, substance use also functions as a negative reinforcement. The more frequently one uses substances as a reward or as a way of coping with negative emotions or life events, the stronger the association becomes and the more difficult it is to extinguish the substance use behavior. This partially accounts for the finding that treatment is more difficult and relapse is more likely among individuals who have longer histories of substance use. It also has been suggested that use of substances to cope leads to an erosion of alternative coping behaviors, thereby making continued substance use and dependence more likely.

Outcome Expectancies

One area of research that has uncovered some of the strongest and most reliable effects of psychology on addictive behavior is that of alcohol outcome expectancies. Addiction is not merely a physiological response to something that feels good and is rewarding; it is influenced strongly by the labeling, interpretation, and meaning that a person ascribes to a substance of abuse. Outcome expectancies are conditioned cognitions; this refers to a person's beliefs about the effects that using alcohol (or another substance) will bring about. People who develop substance use problems report that using a substance results in positive, desired effects such as the ability to avoid or escape negative mood states. Common alcohol expectancies, as identified and described by Alan Marlatt, include relaxation and tension reduction, positive global changes in experience, sexual enhancement, social and physical pleasure, increased assertiveness, and increased arousal and interpersonal power. People may learn what they can expect from alcohol from prior experience or vicariously; indeed, evidence suggests that one need not have experience with alcohol in order to form strong expectancies about its effects. Watching others model the behaviors associated with intoxication (e.g., becoming louder, becoming more socially confident and engaged, and developing looseness of speech) can teach an observer what the effects of alcohol consumption are, thereby creating outcome expectancies. Experience with drinking may then reinforce previously held beliefs about the positive effects of alcohol. Expectancies also influence motives to drink – people who state that they expect alcohol to help relieve tension are more likely to turn to alcohol when stressed. Heavier drinkers report more positive alcohol

outcome expectancies and fewer negative outcome expectancies than lighter drinkers.

Self-efficacy

Another psychological variable that influences the development of substance use disorders is Bandura's concept of self-efficacy. Self-efficacy is defined as an individual's belief in his or her ability to perform a certain behavior in order to achieve a desired outcome. Self-efficacy for substance use is developed when one observes a model obtain and use substances. For example, an adolescent may develop self-efficacy for smoking by observing peers purchasing cigarettes at a location that does not check identification, lighting a cigarette, and inhaling the smoke. The adolescent's confidence in his or her ability to smoke is thereby increased. However, self-efficacy also refers to one's belief that he or she is capable of handling a stressful or challenging situation without using substances. Research has found that people are more likely to use substances in situations where they feel unable to cope with the demands of the situation or negative affect. As one uses substances more and more often to cope with stress or other life problems, the use of other more adaptive coping strategies decreases, which then results in reduced self-efficacy for the use of these alternative coping skills. This also translates into decreased self-efficacy in one's ability to refuse substances in the face of challenging life circumstances.

Social Influences on Substance Use

Families

In addition to genetic factors, addictive behaviors are transmitted between generations in families due to social influences. Social Learning Theory posits that modeling influences behavior, and that adolescents who observe substance use in their parents are more likely to use substances themselves. This assertion is supported in the research literature. However, there is evidence that modeling is not the only way in which parental influence on adolescent behavior takes place – parents also influence adolescents' behavior via norms and perceived attitudes. Numerous studies have found support for the association between parental approval of substance use and adolescent use of alcohol, tobacco, and marijuana – adolescents whose parents have positive attitudes toward substance use are more likely to use substances. Among college students, perceptions of parental approval of alcohol consumption were positively associated with experiencing a drinking problem. Perceived parental approval of illicit drugs was found to predict earlier first use of drugs and increased current frequency of drug use. Families also play a protective

role against the development of substance abuse. Parental monitoring (supervision) and consistent discipline are associated with lower risk for substance abuse among children. Among women, becoming a parent also is associated with decreased risk for drinking problems.

Peers

Peers influence adolescents' values, attitudes, and behavior in multiple domains, including substance abuse. Having a peer group that uses substances is a strong predictor of adolescent substance use, as is the perception that one's peer group endorses substance use. When adolescents associate with peers who hold socially deviant attitudes and beliefs, the risk of substance use increases. Friends' smoking is among the strongest predictors of adolescent smoking behavior. Peer group involvement is thought to impact substance use through interaction with other risk factors, including family problems, stress, mental health, and self-esteem. Among adolescents who drink, the most important reasons for alcohol use were to socialize with friends, cope with tension and anxiety (especially regarding interactions with the members of the opposite sex), improve mood, and alleviate boredom. Male adolescents, who have higher rates of alcohol use than females, also have higher rates of involvement with peer groups that maintain deviant attitudes.

Peer influences on substance use behavior are not only important during adolescence. Studies have shown that alcohol use among adults is likewise influenced by peer drinking. College students' alcohol use was found to be positively correlated with their friends' alcohol use and with the students' perceptions of their friends' drinking. Often, college students who drink heavily report that their peers drink at the same levels as they do. Interventions for college students in which they are given feedback about how much they are drinking in relation to normative drinking for peers of the same gender and age demonstrate that high-risk drinkers are in fact consuming more alcohol than is normative for their peer group. Normative feedback interventions also demonstrate that heavy drinkers overestimate what is normative drinking, such that they erroneously believe most students drink as they do. These interventions consistently have been shown to result in decreased alcohol consumption and related problems for college students. Other research has found a positive correlation between alcohol use in adults and their perceptions of their peers' alcohol use. Heavy-drinking adults report having larger drinking social networks than do light or moderate drinkers. Social networks are important influences on adult substance use as well as adolescent substance use. Several studies have found support for the assertion that greater alcohol

involvement among one's peer network is associated with heavier drinking among both men and women. This relationship is independent of sociodemographic and individual difference variables and alcohol expectancies.

Spouses and Intimate Partners

Among adults, spouses and intimate partners are the most important and influential social connections people have. Research has supported spousal concordance in substance use behavior – wives and husbands tend to use the same substances, and heavy drinking or drug use in one partner predicts heavy use in the other partner. Problem drinkers are disproportionately more likely to be married to other problem drinkers. Marriage, however, also is a protective factor as it is often associated with a decrease in drinking.

Other Individual Difference Variables that Influence Substance Use

Ethnicity and Culture

National surveys have documented racial/ethnic differences in rates of substance use, with certain ethnic minority groups (e.g. African Americans, American Indians/Alaska Natives) reporting disproportionately high rates of substance use and dependence. There are numerous reasons for disparate rates of use and dependence among ethnic minorities, including increased risk factors such as poverty, discrimination, microaggressions, and stress among minority groups. Ethnicity also has been shown to moderate the associations between the risk factors and substance use. One study found that substance availability and perceived parental approval differed among Whites, African Americans, and Asians, resulting in ethnic differences in substance use initiation and stated intentions to use substances. With regard to cigarette use, White adolescents were most strongly influenced by adult and peer smoking; for African Americans, however, risk taking was a stronger predictor of smoking behavior than social norms. Among Hispanics, the perception of adult and peer approval of smoking was the strongest predictor of adolescent tobacco use; among Asians, peer and family influence was not as important for the prediction of adolescent smoking as poor academic performance and low self-esteem.

Other research has found that ethnic labels and ethnic identity influence substance use. In a study of middle school students, having a strong sense of ethnic pride was protective for African American, Mexican American, and mixed-ethnicity students, as these students reported less exposure to drugs and less drug use than those with lower levels of ethnic pride. The opposite was true for ethnically proud White students,

who reported greater drug exposure and use. Also, ethnic minority students who reported having behavior, speech, and looks that are common in their ethnic group reported greater drug exposure and use, whereas White students who viewed their behavior, speech, and looks as typical of their ethnic group reported lower exposure and use of drugs. Among Mexican Americans and American Indians, a stronger sense of ethnic identity was associated with decreased substance use.

Gender

Across cultures, males smoke more, use more drugs, consume more alcohol, and have more alcohol and other substance use disorders than females. Gender differences in alcohol consumption may be due to differences in availability of alcohol and other substances; they also may be partially attributable to adherence to traditional gender roles. Females who espouse more traditional gender role attitudes drink less than their less conventional counterparts, while the opposite holds true for males. Among women, but not men, becoming a parent also is associated with decreased risk for drinking problems. Peer influence on smoking is stronger for females than for males. Research has found that females respond more than males to the reinforcing properties of substances and may develop drug abuse and dependence more rapidly than males. Other risk factors for addiction, such as childhood physical and sexual abuse, depression, intimate partner violence, and posttraumatic stress disorder may play a more important role in the initiation and maintenance of drug use among women than among men. One study found that women's tobacco use was more influenced by social factors than physiological dependence when compared with men's tobacco use. Women also report a greater propensity to use substances to alleviate negative affect than men.

Environmental Influences on Substance Use

Availability of substances has been shown to be a major factor in the initiation of substance use and the development of substance use disorders. In order for a genetic predisposition to result in addictive behavior, one must interact with the agent of addiction (e.g., alcohol or drugs). Increased availability of alcohol or drugs makes increased contact with substances possible. Rates of smoking are increased in areas with no smoking area restrictions and are decreased when laws prohibiting indoor smoking are enforced. The prevalence of alcohol use and alcohol use disorders is greater in neighborhoods with more bars and liquor stores, and research suggests that there are more bars and liquor stores in ethnic minority neighborhoods, which may account for some ethnic group differences in rates of alcohol-related problems. Socioeconomic

status also affects substance use behavior. Poverty is an established risk factor for alcohol and drug problems, and low income is associated with alcohol dependence and comorbid psychiatric disorders. Research on neighborhood disorganization, operationalized as high population density, physical deterioration, high crime rates, and the presence of illegal drug trafficking, has found that residing in disorganized neighborhoods strongly increases the likelihood of adolescent substance use.

Social engineering and public policy approaches to substance-related problems have had some success, adding further support to the biopsychosocial model of addiction. For example, when alcohol was made illegal during prohibition, national rates of drinking and associated health consequences such as cirrhosis of the liver were reduced. There also are areas within the United States (e.g., villages in rural Alaska) where alcohol is illegal. For example, the Alaska State Local Option Law, implemented in 1981, allowed Alaska Native communities to decide whether to permit drinking and what kind of alcohol control policies to implement. Research shows that the rates of homicide and accidental death are lower in communities that opted to ban the sale and importation of alcohol. Laws regulating the sale of alcohol and tobacco to persons under the minimum age limit have served to decrease use of these substances. Between 1970 and 1975, 29 states lowered the minimum drinking age with negative effects on public health; rates of adolescent alcohol consumption, alcohol-related injuries, and automobile fatalities increased during this period. When the minimum drinking age was later increased, there were reductions in adolescent alcohol consumption, alcohol-related injuries, and automobile fatalities. Raising the minimum drinking age also resulted in decreased prevalence of alcohol abuse and dependence in the following years. Research on taxation of alcohol and tobacco supports the use of taxes as a means to decrease alcohol and tobacco use. Among 18–20 year olds, increasing the price of alcohol resulted in decreased automobile fatalities. Such approaches to ameliorating addiction problems would not make sense and would not be effective if the biomedical model of addiction was accurate.

THE BIOPSYCHOSOCIAL MODEL AND ADDICTION TREATMENT

The most successful addiction treatment programs incorporate strategies to enhance coping, reduce craving, manage triggers, and prevent relapse. Some programs involve medication, but pharmacotherapy often is not considered an essential part of recovery from problems of addiction. Instead, finding ways of managing difficult emotions, coping with negative life

circumstances, enhancing social support for sobriety, and establishing a lifestyle free of substance abuse is essential to long-term recovery. Recovery from addiction requires a biopsychosocial approach with attention paid to biological, psychological, and social aspects of addiction.

Natural Recovery

According to the biomedical model, addiction is a chronically relapsing brain disease that will progress unless treated. The biopsychosocial model, on the other hand, recognizes the occurrence of natural recovery. Natural recovery, or recovery in the absence of professional treatment, is one of the most common methods of recovering from substance abuse problems. Studies of the reasons for natural recovery have identified many precipitants to change, including a meaningful religious or spiritual experience, suffering a loss, support from family and friends, a personal injury or illness, or the substance-related injury or the illness of another person. These reasons are external motivators, aspects of one's social and cultural environment. In recovering from addiction, strategies that support successful self-change include the establishment of social support for sobriety, adoption of new coping skills and stress management techniques, and overall lifestyle changes such as changing one's social network, restructuring leisure time, and avoiding triggers that cause craving. One research study found that people with higher levels of motivation to change, greater commitment to change, more frequent and persistent use of coping strategies, and more frequent use of self-reinforcement strategies were more likely to be successful in self-change of addictive behaviors.

Medication

Medication is the treatment of choice for disease under the biomedical model. There are several medications that are helpful during substance abuse treatment, but no medication has been shown to cure or prevent addiction, as would be expected under the biomedical model. For smoking, nicotine replacement therapies such as the nicotine patch, gum, and nasal spray have been shown to double one's chances of successfully quitting. These tools work by gradually reducing the smoker's dependence on nicotine while extinguishing the smoking behavior, with the goal of slowly tapering off the nicotine until one is free of the substance. For opiate dependence, methadone and buprenorphine have been shown to be effective at reducing cravings and avoiding withdrawal symptoms, but these medications have side effects and other consequences. People in treatment for alcohol dependence may be prescribed

Antabuse to classically condition them to develop an aversion to alcohol, but this is only modestly effective under ideal circumstances. Naltrexone, an opiate receptor agonist, when combined with medical management, showed evidence of being equally effective in treating alcohol dependence as an intervention that combined elements of several effective behavioral treatments. Treatment for substance dependence in general may benefit from anxiolytic or antidepressant pharmacotherapy to help manage the negative mood that previously was managed by alcohol or other substance use. Overall, medication can be a helpful adjunct to psychosocial treatment, but no medication has been shown to solve the problem of addiction, and recovery in the absence of pharmacological treatment is common.

PSYCHOSOCIAL FACTORS IN THE TREATMENT OF ADDICTION

Readiness to Change

Of particular relevance to the treatment of addiction is the psychological factor of motivation or readiness to change. Research has found that motivation increases the likelihood that someone will seek out treatment and complete a treatment program or will be successful in changing his or her substance use in the absence of formal treatment. Greater motivation at treatment initiation also is predictive of better long-term outcomes. According to the Transtheoretical Model, a leading model of behavior change that was developed to explain how people change addictive behaviors, readiness to change is a function of decisional balance, or the cognitive appraisal of the pros and the cons of changing. People who rate the cons of changing their substance use as more salient than the pros of changing report being less motivated to reduce their substance use. People for whom the pros of changing outweigh the cons of changing their substance use are more motivated to change and have greater success in attempts to limit their consumption of substances. Readiness to change can be impacted by processes of change such as consciousness raising, dramatic relief, and self-liberation. Motivational interviewing is one therapeutic style that has been shown to be especially effective with substance users who are low in motivation to change and to bring about greater readiness to change. The extensive body of literature demonstrating the impact of readiness to change on subsequent substance use provides additional support for the biopsychosocial model over the biomedical/disease model of addictive behavior.

Self-efficacy

Self-efficacy is a cognitive factor that is crucial to recovery from addiction. In order to refrain from using substances, one needs to believe that he or she is capable of managing difficult situations in other ways. Self-efficacy can be built through experience and exposure to different behavioral options. For example, when a smoker foregoes a cigarette in favor of a brisk walk to manage stress, he or she builds self-efficacy by proving to himself or herself that a response other than smoking is possible for the individual, and that stress can be relieved in the absence of cigarette smoking. The greater experience one has with using coping strategies other than substance use, the greater his or her self-efficacy becomes.

SUMMARY

In summary, there is a great deal of evidence supporting the biopsychosocial model of addiction, which gives weight to biological, psychological, and social factors in understanding the development and progression of substance use problems. Research supports the role of biological factors such as genetic predisposition in the development of addictive behaviors. At the same time, psychological and cognitive factors such as outcome expectancies, self-efficacy, and readiness to change and social factors such as family, peer, and intimate partner influences on substance use are equally important. In order to prevent and treat addictive behaviors, attention must be paid to the biological, psychological, and social factors that interact to produce and maintain disorders of addiction. The evidence clearly indicates the importance of factors in all three realms, and successful treatment programs will benefit from taking a biopsychosocial view of the problem of addiction.

SEE ALSO

Behavioral Economic Factors in Addictive Processes, Cognitive Factors in Addictive Processes, Contextual Factors in Addiction, Disease Model, Families and Addiction, Gender Differences, Interpersonal Factors and Addictive Disorders, Natural Recovery, Peer Influences on Addiction, Personality and Addiction Processes, Craving and Expectancies

Glossary

Biopsychosocial the influence of biological, psychological (including cognitions, emotions, and behaviors), and social (including culture and environment) factors on the development, maintenance, and treatment of disease.

Health Belief Model the Health Belief Model is an empirically supported theory of health behavior change developed to understand and predict the use of health services. The model posits that health behaviors are influenced by perceived susceptibility to and perceived severity of disease, as well as perceived benefits and barriers to changing behavior. In recent years, two additional constructs (cues to action and self-efficacy) have been incorporated in the Health Belief Model to allow for the prediction of more general health behaviors.

Theory of Reasoned Action/Theory of Planned Behavior the Theory of Reasoned Action/Theory of Planned Behavior (TRA/TPB) is a combination of two psychological theories of health behavior change developed by Fishbein and Azjen to explain and predict human behavior. The models posit that the most important aspect of behavior change is one's intention to change. The intention comprises a person's attitude toward the behavior and subjective norms. Attitudes, in turn, represent a combination of behavioral beliefs, evaluations of behavioral outcome, normative beliefs, and the motivation to comply with recommendations. The model has empirical support and allows for the prediction of human behavior.

Further Reading

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Relevant Websites

- <http://www.cdc.gov> – CDC
- <http://www.niaaa.nih.gov> – NIAAA
- <http://www.nida.nih.gov> – NIDA
- <http://www.nida.nih.gov/nidamed> – NIDAMED
- <http://www.samhsa.gov> – SAMHSA
- <http://en.wikipedia.org> – Wikipedia